

Investigating multisensory hypersensitivity and self-reported perceptual ability in Fibromyalgia

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Introduction

- Fibromyalgia has predominantly been classified as a condition of disturbed pain processing.
- This is associated with impaired perceptual ability (detection and discrimination of painful and tactile stimuli) and hypersensitivity to pain (reduced tolerance).¹
- Beyond pain, emerging evidence suggests that fibromyalgia sufferers experience multisensory hypersensitivity.⁴
- Limited research has investigated perceptual ability across modalities in fibromyalgia.
- Understanding how basic perception is affected is crucial for informing the potential treatment of the condition through perceptual training.

Method

- 188 fibromyalgia patients and 121 controls completed online self-report measures of hypersensitivity and perceived perceptual ability across sensory modalities.
- Sensory perception quotient (SPQ) – measures perceived discrimination and detection ability of five sensory modalities. Lower scores indicate increased sensitivity.³
e.g., I would be able to distinguish different people by their smell
- Sensory hypersensitivity scale (SHS)- measures tolerance across nine sensory modalities. Higher scores indicate increased sensitivity.²
e.g., I am sensitive to bright lights

Research question- How are different aspects of sensory processing affected in fibromyalgia across modalities?

Exploratory question- Do different subgroups exist in fibromyalgia?

Results

SPQ

Modality	Fibro M(sd)	Control M(sd)	Partial eta squared
Touch*	7.72(3.85)	9.44(3.74)	.050
Hearing*	6.30(2.56)	7.28(2.88)	.030
Vision*	6.04(2.84)	9.28(2.84)	.240
Smell	11.20(4.82)	12.30(4.97)	.010
Taste	3.98(2.11)	4.28(1.97)	.005
Total SPQ*	35.20(13.00)	42.6(12.9)	.072

Table 1. Means, standard deviations and partial eta square values for comparisons on the SPQ

* Indicates significant comparisons

- Fibromyalgia group reported significantly higher perceived perceptual ability for touch, hearing, vision and total score
- No group differences for smell and taste

SHS

Modality	Fibro Mdn(range)	Control Mdn(range)	r
Taste*	3.33(2.00)	2.00(1.67)	.304
Allergies*	3.67(1.67)	1.67(2.00)	.501
Heat*	4.25(1.50)	3.00(2.00)	.391
Cold*	4.50(1.00)	3.00(2.00)	.377
Vision*	4.67(1.00)	3.33(1.67)	.573
Pain*	3.67(1.42)	3.00(1.33)	.253
Hearing*	4.00(1.33)	3.33(2.33)	.296
Touch*	4.00(1.00)	3.33(2.00)	.484
Smell*	4.00(0.75)	3.67(1.67)	.233
Total SHS*	3.88(0.68)	2.88(0.64)	.646

Table 2. Median, range, and r for all comparisons on the SHS

*Indicates significant comparisons

- Fibromyalgia group reported significantly higher sensitivity (reduced tolerance) across all sensory modalities.

Hierarchical clustering on principal components

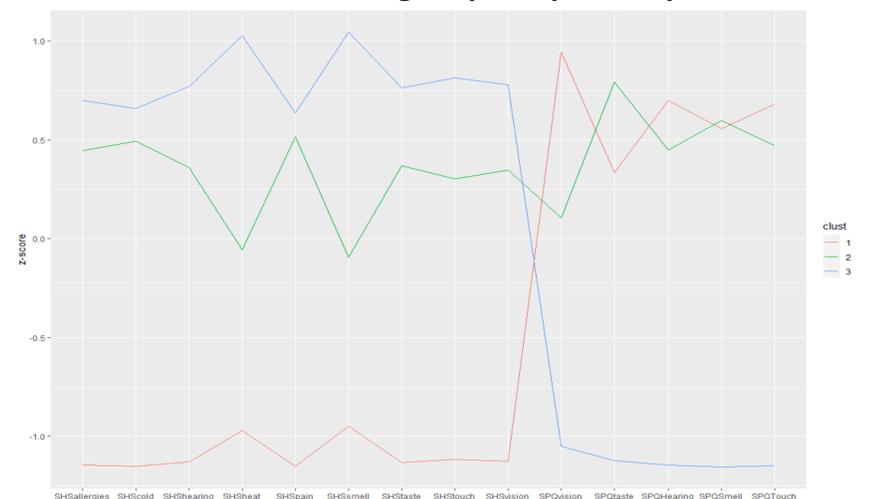


Figure 1. SHS modality and SPQ modality means for each cluster

- Two main fibromyalgia subgroups
- Cluster 2 - reduced tolerance and lower perceived perceptual ability
- Cluster 3- reduced tolerance and enhanced perceived perceptual ability

Discussion

Group comparisons

- Reduced tolerance across modalities in fibromyalgia replicates previous findings.²
- Enhanced perceived perceptual ability challenges previous findings of reduced ability in pain and touch.
- Discrepancies may exist between self-reported and actual ability.

Cluster analysis

- Within group differences in perceptual self-awareness.
- Patients may benefit from treatments focussing on different aspects of sensory processing.

References

1. Borchers, A. T., & Gershwin, M. E. (2015). Fibromyalgia: A Critical and Comprehensive Review. *Clinical Reviews in Allergy and Immunology*, 49(2), 100–151. <https://doi.org/10.1007/s12016-015-8509-4>
2. Dixon, E. A., Benham, G., Sturgeon, J. A., Mackey, S., Johnson, K. A., & Younger, J. (2016). Development of the Sensory Hypersensitivity Scale (SHS): a self-report tool for assessing sensitivity to sensory stimuli. *Journal of Behavioral Medicine*, 39(3), 537–550. <https://doi.org/10.1007/s10865-016-9720-3>
3. Tavassoli, T., Hoekstra, R. A., & Baron-Cohen, S. (2014). The Sensory Perception Quotient (SPQ): Development and validation of a new sensory questionnaire for adults with and without autism. *Molecular Autism*, 5(1), 1–10. <https://doi.org/10.1186/2040-2392-5-29>
4. Wilbarger, J. L., & Cook, D. B. (2011). Multisensory hypersensitivity in women with fibromyalgia: Implications for well being and intervention. *Archives of Physical Medicine and Rehabilitation*, 92(4), 653–656. <https://doi.org/10.1016/j.apmr.2010.10.029>