Learning Pain Words

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Introduction

"Don't we talk about sensations every day, and give them names? But how is the connection between the name and the thing named set up?

- Wittgenstein, 1953

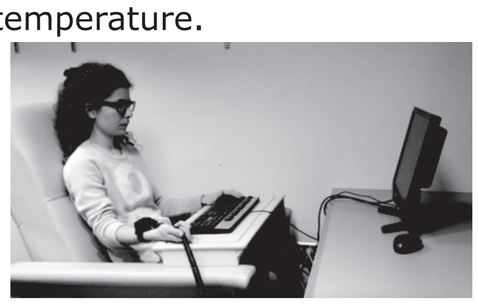
Wittgenstein's [1] question of how sensory words are learned remains unaccounted for by existing theories of language learning. Previous research investigated how wordforms are learned (without meaning) [2-4], or focused on how words map to objects [5-10]. While this is relevant for understanding the acquisition of concrete words, it is less appropriate for abstract words, or words denoting subjective personal experiences (e.g., pain), where there is no object to point to and name.

Recognising that learning abstract words involves a variety of learning sources, including direct personal exposure, observation of experiences in other people, or verbal definitions, we designed a paradigm, in which participants learned words denoting novel sensory experiences (painful and non-painful tactile stimulation) through various sources of learning. Our main research question was as follows:

Can adults learn sensory words equally well from different sources?

Methods

Sensory stimuli were presented using the TSA-II NeuroSensory Analyser (Medoc) probe strapped to the volar forearm. They were initiated from a baseline of 32°C and increased or decreased to the target temperature.



Study 1 Definition vs. Personal experience

Participants: N=18 (16 female, M=23.4 years, SD=5.1).
Stimuli: Word stimuli: 3-letter (CVC) pseudowords, e.g., 'fof'. Sensory stimuli: short (2 second) or long (4 second) individually calibrated Cool (non-painful) 27.2°C (SD=1.6), Cold (painful) 17.2°C (SD=3.5), Warm (non-painful) 34.7°C (SD=1.0), or Hot (painful) 41.4°C (SD=3.2) sensation. Word defintions used - e.g., 'long cold', 'short hot' etc.
Learning: 9 words learned in total (3 without meanings, 3 with definitions, 3 with sensations) in 3 mixed blocks (repeated twice). Each word was repeated 10 times.
Test: Recognition test (Old word / New word?) with 24 items (9 learned words + 3 filler words) x 2 presentations each.

Study 2 Observation vs. Personal experience

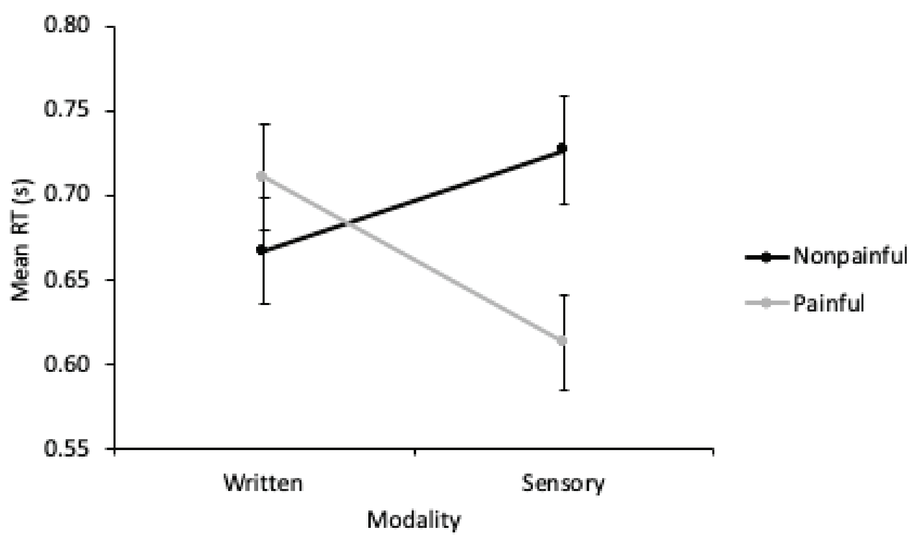
Participants: N=20 (14 female, M=22.97 years, SD=2.95).
Stimuli: Word stimuli: 3-letter (CVC) pseudowords, e.g., 'zet'. Sensory stimuli: individually calibrated Hot (painful) 40.55°C (SD=3.01) and Cool (non-painful) 28.00°C (SD=0.45), or Cold (painful) 18.70°C (SD=4.45) and Warm (non-painful) 35.10°C (SD=1.37). Videos of other people undergoing this experiment.
Learning: 6 words learned in total (2 without meanings, 2 with observation, 2 with sensations) in 2 blocks (repeated twice). Each word repeated 10 times.
Test: Recognition test (Old word / New word?) with 24 items (6 learned words + 6 filler words) x 2 presentations each.

Results

In both experiments, participants learned all words, as evidenced by the difference in reaction times to learned vs. new words.

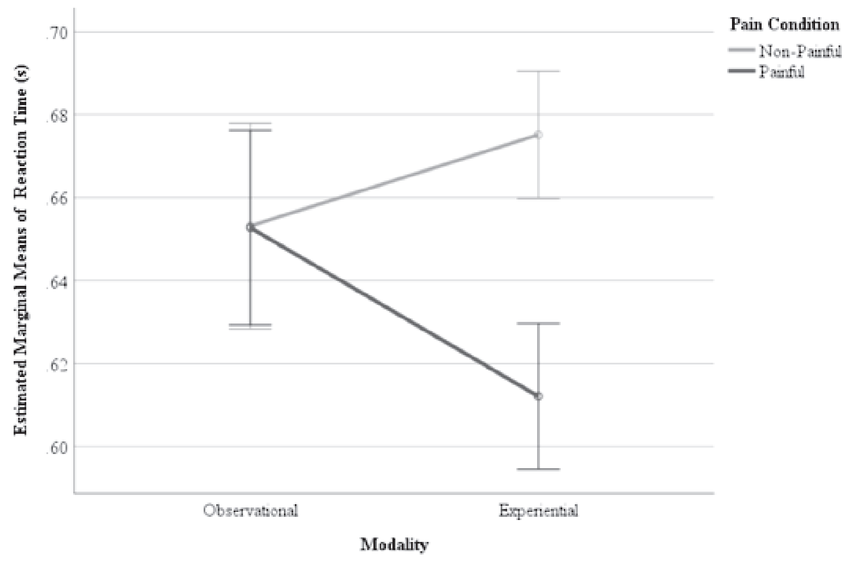
There was no difference between reaction times to words without meaning (control) vs. words with meaning (painful or non-painful words).

Comparison between reading a definition of a word denoting a sensation vs. experiencing sensory stimulation.



There was no difference between the recognition speed for painful and non-painful words learned through reading a definition, but significantly faster recognition of pain words learned through painful stimulation [$F(1,15)=4.561$, $p<0.05$].

Comparison between experiencing sensory stimulation vs. observing sensory stimulation.



There was no difference between the recognition speed for painful and non-painful words learned through observation, but significantly faster recognition of pain words learned through painful stimulation [$F(1,19)=4.43$, $p<0.05$].

Conclusions

Sensory words can be learned from various sources.

Adults are capable of learning sensory vocabulary through personal experience, observation, or definitions.

Pain words are learned better if pain is experienced directly.

While personal personal experience is not necessary for learning, it enhances learning specifically for words denoting painful sensations. No such enhancement was observed for pain words learned though observation/definition, or for non-pain words learned through personal experience.

References

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Acknowledgements

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