

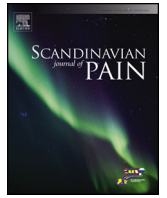


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Original experimental

Swearing as a response to pain: A cross-cultural comparison of British and Japanese participants

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HIGHLIGHTS

- Swearing increases pain tolerance cross-culturally in British and Japanese sample.
- Proposal that perception modification occurs via neural inhibitory pain mechanisms.
- Swearword related hypoalgesia may be a universal, not socio-cultural, phenomenon.

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ABSTRACT

Background and aims: Research suggests swearing can moderate pain perception. The present study assessed whether changes in pain perception due to swearing reflect a “scripting” effect by comparing swearing as a response to pain in native English and Japanese speakers. Cognitive psychology denotes a ‘script’ to be a sequence of learnt behaviours expected for given situations. Japanese participants were included as they rarely, if ever, swear as a response to pain and therefore do not possess an available script for swearing in the context of pain. It was hypothesised that Japanese participants would demonstrate less tolerance and more sensitivity to pain than English participants, and – due to a lack of an available script of swearing in response to pain – that Japanese participants would not experience swearword mediated hypoalgesia.

Methods: Fifty-six native English (mean age = 23 years) and 39 Japanese (mean age = 21) speakers completed a cold-pressor task whilst repeating either a swear or control word. A 2 (culture; Japanese, British) × 2 (word; swear; non-swear) design explored whether Japanese participants showed the same increase in pain tolerance and experienced similar levels of perceived pain when a swearing intervention was used as British participants. Pain tolerance was assessed by the number of seconds participants could endure of cold-pressor exposure and self-report pain measurements. Levels of perceived pain were assessed using a 120-mm horizontal visual analogue scale anchored by descriptors in the participant’s native language of “no pain” (left) and “terrible pain” (right). The participant was asked to mark a 10 mm vertical line to indicate overall pain intensity. The score was measured from the zero anchor to the participant’s mark.

Results: Japanese participants reported higher levels of pain ($p < 0.005$) and displayed lower pain tolerance than British participants ($p < 0.05$). Pain tolerance increased in swearers regardless of cultural background ($p < 0.001$) and no interaction was found between word group and culture ($p = 0.96$), thereby suggesting that swearing had no differential effect related to the cultural group of the participant.

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Conclusions: The results replicate previous findings that swearing increases pain tolerance and that individuals from an Asian ethnic background experience greater levels of perceived pain than those from a Caucasian ethnic background. However, these results do not support the idea of pain perception modification due to a “scripting” effect. This is evidenced as swearword mediated hypoalgesia occurs irrespective of participant cultural background. Rather, it is suggested that modulation of pain perception may occur through activation of descending inhibitory neural pain mechanisms.

Implications: As swearing can increase pain tolerance in both Japanese and British people, it may be suggested that swearword mediated hypoalgesia is a universal phenomenon that transcends socio-cultural learnt behaviours. Furthermore, swearing could be encouraged as an intervention to help people cope with acute painful stimuli.

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1. Introduction

Research has shown that the act of repeating a swearword can elicit an increase in pain tolerance when compared with repeating a non-swear word [1–3]. The hypoalgesic effect has been explained as being mediated by the sympathetic nervous system triggered by swearing [3].

However, an alternative explanation posits that the act of voluntarily vocalising modulates responses to pain by engaging in a pre-learned scripted behaviour. The term “script” in cognitive psychology was coined to denote the idea that many transactions are stereotypical to the point that they can be written down like a script [4]. It may be this scripted aspect of swearing in response to pain that produces the hypoalgesic effect by distracting attention from processing the pain response [5], perhaps by evoking familiarity or positive emotions.

One way of assessing the scripted explanation of swearing in response to pain would be a cross-cultural comparison between cultures that differ in the degree of social acceptability afforded to swearing as a pain behaviour. The English language has a colourful and expansive profane vocabulary [6] and swearing as a response to pain is culturally accepted and commonplace within British culture [7]. In contrast, the Japanese language is filled with subtle verbal nuances that allow for verbal denigration to occur without profane language, and has been described as a language largely devoid of swearing [8,9]. For example, a Japanese speaker could cause offence by using a pronoun implying that their own status is higher than the listener [10]. Anecdotal accounts indicate that Japanese speakers rarely, if ever, swear as a response to pain. Rather, onomatopoeic expressions are used in response to and as an expression of pain. For example, ‘*Zuki-zuki*’ indicates a moderate to severe throbbing pain. Forty-percent of native Japanese patients reporting tension headaches expressed their headache characteristics using *zuki-zuki* [11]. Therefore, while the average native English speaker can be thought of as having a well-rehearsed “script” for swearing in response to pain, the average native Japanese speaker would not. Comparing the efficacy of swearing in response to pain in native English and Japanese speakers would therefore shed light on the “script” theory of hypoalgesia of swearing.

The current study recruited 95 (56 British) participants, and asked them to complete a cold-pressor pain task whilst repeating either an English or Japanese language-specific swear or neutral (control) word. Based on previous research indicating that individuals with an Asian ethnic background demonstrate less tolerance and more sensitivity to pain than Caucasians [12,13], we hypothesise that native English speakers would show increased pain tolerance and reduced pain perception compared to native Japanese speakers. Further, as Japanese speakers do not commonly use swearing in response to pain, swearing should not trigger a rehearsed “script” and so should not result in a reduced pain experience. Therefore, we would expect only English speakers to show

an increased pain tolerance and reduced pain experience when they swear.

2. Method

2.1. Design

A 2 (culture; Japanese, English) × 2 (word intervention; swearing, non-swearing) fully independent design was implemented. Pain tolerance was measured using cold-pressor latency and pain perception was self-assessed using a visual analogue scale. Participants were randomly assigned to the swearing and non-swearing conditions.

2.2. Participants:

Ninety-five students (59 females and 36 males; age range 18–44; mean age 22.42 years) based on an a priori power calculation. The power calculation indicated that a minimum sample size of $n=90$ will allow for 80% power to detect medium sized effects ($d=0.6$) [2] based on comparisons across the swearing and non-swearing independent groups with alpha set at 0.05 [14]. However, a slightly larger number was recruited in anticipation of possible attrition. Participants were recruited via opportunity sampling from a university in the North West of England. There were 56 native-English speaking participants (30 controls and 26 swearers, mean age 23 years), and 39 native-Japanese speaking participants (20 controls, and 19 swearers, mean age 21 years). Japanese participants had been living in the UK for a maximum of five months as part of a foreign exchange programme. Thus, it is unlikely that a script of swearing in response to pain had been learnt and internalised by Japanese participants. Furthermore, whilst Japanese participants did have varying levels of English language proficiency, all participants were students undertaking a year abroad programme and as such would be unlikely to have English language fluency. Participants were randomly allocated into swearing and non-swearing groups. Participants were excluded from the study applying criteria identified via a confidential self-report screening questionnaire. These criteria included: (i) hypertension; (ii) heart arrhythmia; (iii) suffering from Raynaud’s disease (iv) being prone to poor peripheral circulation in the hands/feet (v) currently feeling unwell for any reason. All participants gave verbal consent and were tested in accordance with the national and local ethics guidelines adhering to the Declaration of Helsinki. Participants obtained no financial reward for their participation.

2.3. Materials and apparatus

2.3.1. Cold-pressor

Cold-pressor pain was induced through the submergence of the non-dominant hand in ice cold water. A manual set-up,

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