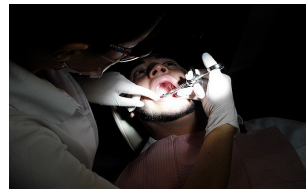


The mediating role of conditioning events on the relationship between fear of pain and dental anxiety

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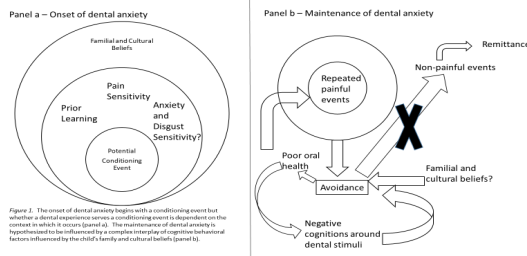
Background

Dental anxiety is a common problem believed to affect about 15%-20% of adults (Åström et al., 2011; Milgrom et al., 1999). Dental anxiety is associated with poorer oral-health related quality of life (Svensson et al., 2018) as well as poorer social and emotional well-being (Luoto et al., 2009). Numerous studies suggest the onset of dental anxiety begins with a negative dental experience that serves as a conditioning event (Berggren et al., 1997; Davey, 1989). Individual-level variables such as fear of pain (McNeil et al., 2001) have also been implicated as having an important role in the etiology and maintenance of dental anxiety.



Purpose and Hypotheses

Seligman et al. (2017) propose a model in which individual characteristics such as fear of pain lead to a greater susceptibility to fear conditioning in response to painful experiences (see panel A in figure 1 below). Based on this model, we hypothesize that the potential for an event to serve as a conditioning experience is partially dependent on the presence of certain constitutional factors, such as fear of pain, and propose that fear of pain may serve to focus one's attention on potentially painful stimuli or interpret or recall stimuli as noxious, increasing the likelihood of fear conditioning. Therefore, in this study we tested a model in which the relationship between fear of pain and dental anxiety is mediated by relevant dental conditioning events.



Results

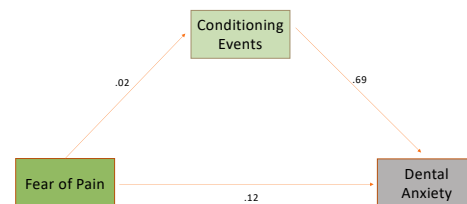
The percentage of participants with high dental anxiety was 23%. Pearson correlations found that fear of pain was significantly positively correlated with dental anxiety ($r = .390, p < .001$) and conditioning events ($r = .228, p < .001$). In the mediation analyses, fear of pain predicted conditioning events, which in turn predicted dental anxiety. There was also evidence that the fear of pain/dental anxiety relationship was partially mediated by the number of conditioning experiences (95% CI on standardized indirect effect = .02, .12).

Correlations between Variables

	Conditioning Events	Dental Anxiety
Fear of Pain	.228**	.528**
Conditioning Events	---	.390**
Dental Anxiety	.390**	---

Note: ** $p \leq .001$

Dental-relevant Conditioning Events as a Mediator of the Relationship between Fear of Pain and Dental Anxiety



Note: Above values are standardized coefficients. Hierarchical Bayesian simulations indicated strong indirect effects of Fear of Pain on Dental Anxiety through Conditioning Events (95% CI on standardized indirect effect = .02, .12)



Methods

Participants

- 183 participants (61% male and 78% non-Hispanic White) completed an online survey via MTurk assessing fear of pain, conditioning events, and dental anxiety. Mean age was 37.91 years ($SD = 11.72$; range 20-70).

Instruments

- Fear of Pain** was assessed with the Fear of Pain Questionnaire-III (McNeil and Rainwater, 1998) which measures an individual's fear of painful stimuli. Scores range from 30-150 with higher scores indicating higher fear of pain.
- Conditioning Events** were questions about the number of different types of negative dental learning experiences and were assessed using a modified version of the Level of Exposure-Dental Experiences Questionnaire (LOE-DEQ; Oosterink et al., 2008).
- Dental Anxiety** was measured using the Modified Dental Anxiety Scale (Humphris et al., 1995). Total scores on this measure can range from 5-25. A score of 19 or greater indicates high dental anxiety.

Conclusions

- Findings are consistent with the theory that individuals with a high degree of fear of pain are more vulnerable to experiencing dental conditioning events as aversive experiences that lead to fear conditioning, because these events may be more salient to them.
- Therefore, individuals with high fear of pain may be at increased risk of dental anxiety because they are more susceptible to these conditioning events.
- Although these results are cross-sectional and should be confirmed with longitudinal data, if findings are confirmed, this suggests that individuals with high fear of pain are at high risk for dental anxiety and, therefore, targeted prevention efforts should be aimed toward this group.



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