

Research Proposal for the High School Academic Research Competition 2026

Name:

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Research Topic:

To what extent does reward-framed versus autonomy-framed reassurance differentially influence pain expectancy, procedural anxiety, and willingness to seek future healthcare in children aged 8–12?

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Abstract

Children's anticipatory anxiety before medical procedures predicts immediate distress and long-term healthcare avoidance. Yet no study has compared reward-framed versus autonomy-framed reassurance on pain expectancy, procedural anxiety, and healthcare willingness simultaneously. This between-subjects experiment will expose 90–120 children aged 8–12 to a simulated blood draw followed by one of three scripted reassurance conditions, with outcomes assessed via validated measures and MANOVA. Autonomy-framing is predicted to outperform reward-framing by reducing underlying anxiety rather than merely incentivising compliance, offering clinicians immediate, zero-cost communication guidance.

Introduction

Children's anticipatory anxiety before medical procedures is clinically significant and uniquely malleable through communication. Atlas and Wager (2012) showed that expected pain predicts how much pain is actually felt. This occurs through top-down neural processes, meaning that reducing a child's expectations of pain may reduce their suffering. Negative healthcare associations formed in childhood predict avoidance of medical care in adulthood (Pate et al., 1996), representing a significant and compounding public health burden.

Two communication strategies dominate clinical practice: reward-based reassurance, which motivates compliance through external incentives, and autonomy-supportive reassurance, which emphasises the child's sense of control. These approaches rest on fundamentally different psychological assumptions, yet a systematic search of PsycINFO and PubMed using terms such as reassurance framing, paediatric anxiety, and autonomy support yielded no studies directly comparing their effects on pain expectancy, procedural anxiety, and healthcare willingness simultaneously in children aged 8–12. This gap is surprising given how frequently reassurance is used in real paediatric settings (Blount et al., 2009). This study aims to address it.

Literature Review

Kain et al. (2006) demonstrated that pre-procedural anxiety predicts intraoperative distress and post-operative complications, highlighting anxiety as not only emotionally but physiologically consequential. This underscores the importance of early intervention: if anxiety before a procedure worsens its physical outcomes, then communication strategies that reduce anticipatory anxiety have implications beyond comfort alone. Blount et al. (2009) found, through systematic behavioural observation, that adult coping-promoting speech during venipuncture significantly reduced child distress, whereas procedure-focused reassurance paradoxically worsened it. This suggests that how adults frame reassurance matters more than whether they reassure at all. Reward-based approaches draw on operant conditioning: external incentives increase compliant behaviour (Skinner, 1938). However, Self-Determination Theory predicts that externally controlled motivation leaves underlying anxiety unaddressed, whereas perceived autonomy reduces anxiety and supports intrinsic regulation (Deci & Ryan, 2000), while Moseley and Butler (2015) further establish that pain expectancy is a modifiable cognitive output, suggesting autonomy-framing may reduce experienced pain through expectancy mechanisms as well as emotional ones. Together, these findings point to a clear prediction: autonomy-framing should outperform reward-framing not only behaviourally but also neurologically, via expectancy modulation. Yet this prediction has never been experimentally tested. This study aims to do so.

Methodology

This study uses a pre-registered, between-subjects experimental design with three conditions: reward-framed, autonomy-framed, and neutral control. Including a control group allows comparison against a true baseline rather than simply contrasting two active conditions against each other.

A power analysis suggests a minimum sample of approximately 100 participants to detect meaningful differences. Approximately 90–120 children aged 8–12 will be recruited across two to three primary schools, depending on consent rates and school availability, giving a realistic target within a standard academic semester. Children with diagnosed anxiety disorders or prior traumatic medical experiences will be excluded to reduce variance confounds. Parental informed consent and child assent will be obtained prior to participation.

Participants begin by completing validated baseline measures: the Spence Children's Anxiety Scale (Spence, 1998) for trait anxiety, and the Faces Pain Scale – Revised (Hicks et al., 2001) for pain expectancy. They then watch a standardised 3-minute video depicting a routine blood draw, developed in consultation with a paediatric nurse and piloted with a separate sample of 10 children to confirm it produces moderate anticipatory anxiety without being distressing. A trained research assistant then delivers one of three scripted statements:

- Reward: “If you stay calm and still, you’ll get to pick a prize from the prize box afterwards.”
- Autonomy: “You get to decide how you want to handle this. Some kids look away, some squeeze something. Whatever works for you, I’ll guide you.”
- Control: “The procedure will begin shortly. Let me know if you have questions.”

To reduce experimenter bias, research assistants will be trained using a standardised script and will not be informed of the study's primary hypotheses. Post-exposure, participants complete the State-Trait Anxiety Inventory for Children (Spielberger, 1973), a follow-up rating of their pain expectancy, and a three-question healthcare willingness scale piloted with 15 children outside the main sample to establish face validity and internal consistency (target Cronbach's $\alpha \geq .70$; Nunnally, 1978). Participants also complete a brief open-ended reflection on whether they felt in control or pressured.

A one-way MANOVA (Multivariate Analysis of Variance) will test overall group differences across all three outcomes simultaneously: anxiety, pain expectancy, and healthcare willingness, reducing the risk of false positives from multiple comparisons, followed by univariate ANOVAs (Analysis of Variance) with Tukey post-hoc comparisons and η^2 effect sizes. Qualitative reflections will undergo reflexive thematic analysis (Braun & Clarke, 2006) to contextualise quantitative findings. No real procedures are involved, and a full age-appropriate debrief will be provided.

Significance and Feasibility

This study integrates developmental psychology, pain neuroscience, and communication research in a way that has not yet been done experimentally. If autonomy-framing reduces anxiety and pain expectancy more effectively than reward-framing, clinicians will gain a concrete, zero-cost recommendation applicable across paediatric settings. The procedure takes approximately 20–25 minutes per participant, and all validated measures will be freely available for academic use. Time constraints in school settings may limit the recruitment pace, and using a simulated rather than a real medical procedure limits ecological validity. Therefore, these findings would be preliminary, warranting replication in clinical contexts.

Conclusion

By experimentally isolating the effect of reassurance framing on children's pain expectancy, procedural anxiety, and future healthcare willingness, this study aims to bridge psychological theory and clinical practice in a way that is both novel and actionable. Its findings could provide healthcare professionals and educators with immediate, evidence-based guidance for improving children's experience of medical care, as well as their long-term willingness to engage with it.

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