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BNST and amygdala responses to unpredictable threat in children

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Background: Anxiety disorders are chronic disorders that arise early in development. Translational evidence demonstrates that the bed nucleus of the stria terminalis (BNST) is critical for anxiety. In adults, the BNST drives the anticipation of unpredictable threat and is elevated in individuals with anxiety disorders. However, it remains unknown whether the BNST is involved in unpredictable threat anticipation in children. Methods: Forty-two 8 - 10-year-old children participated in an unpredictable threat fMRI task in which they were trained to associate cues with images. BNST and amygdala activation was examined in response to cues and images. Significant findings were followed by task-based functional connectivity analyses. Results: In response to unpredictable cues, children showed a significant amygdala response but no response in the BNST. During image viewing, the amygdala, but not the BNST, showed a significantly greater response to fear face relative to neutral images. Conclusion: Unpredictable threat activated the amygdala, but not the BNST, in children, a pattern opposite of that observed previously in adults. Thus, the BNST's role in threat processing may emerge later in development.

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