

The effects of social isolation on fear learning in adolescents

Introduction

Loneliness and isolation are increasing in societies all around the world¹⁻².

Adolescents may be particularly sensitive to the effects of isolation³⁻⁵.

Social isolation has been found to increase anxiety behaviours in animal models of adolescence⁶.

In rodents, social isolation in adolescence has been associated with a significant deficit in the extinction of conditioned fear⁷.

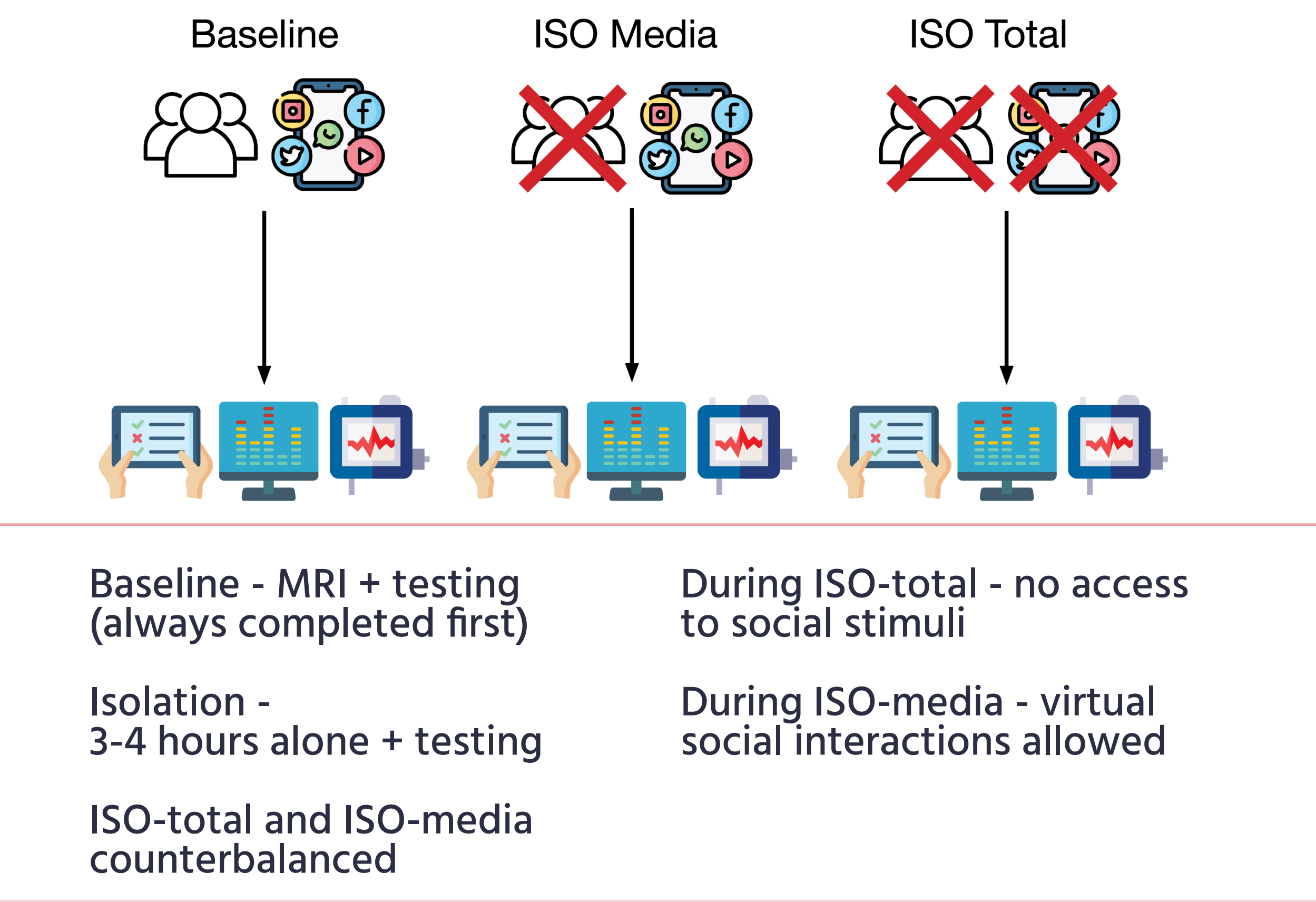
Research Question

How does social isolation affect fear learning in human adolescents?

Methods

Participants 42 participants (Age 16-19 years; 18 male)

Study Design 3 experimental sessions



Fear Learning Task Pavlovian differential fear learning



Participants learn to associate neutral shapes with an aversive sound (a loud screech)

Arousal - "How anxious does this shape make you feel?"
[1] not at all anxious - [9] very anxious

Assesses the ability to discriminate between learned threat (CS+) and safety (CS-) cues

Valence - "How unpleasant/pleasant do you find this shape?"
[1] very pleasant - [9] very unpleasant

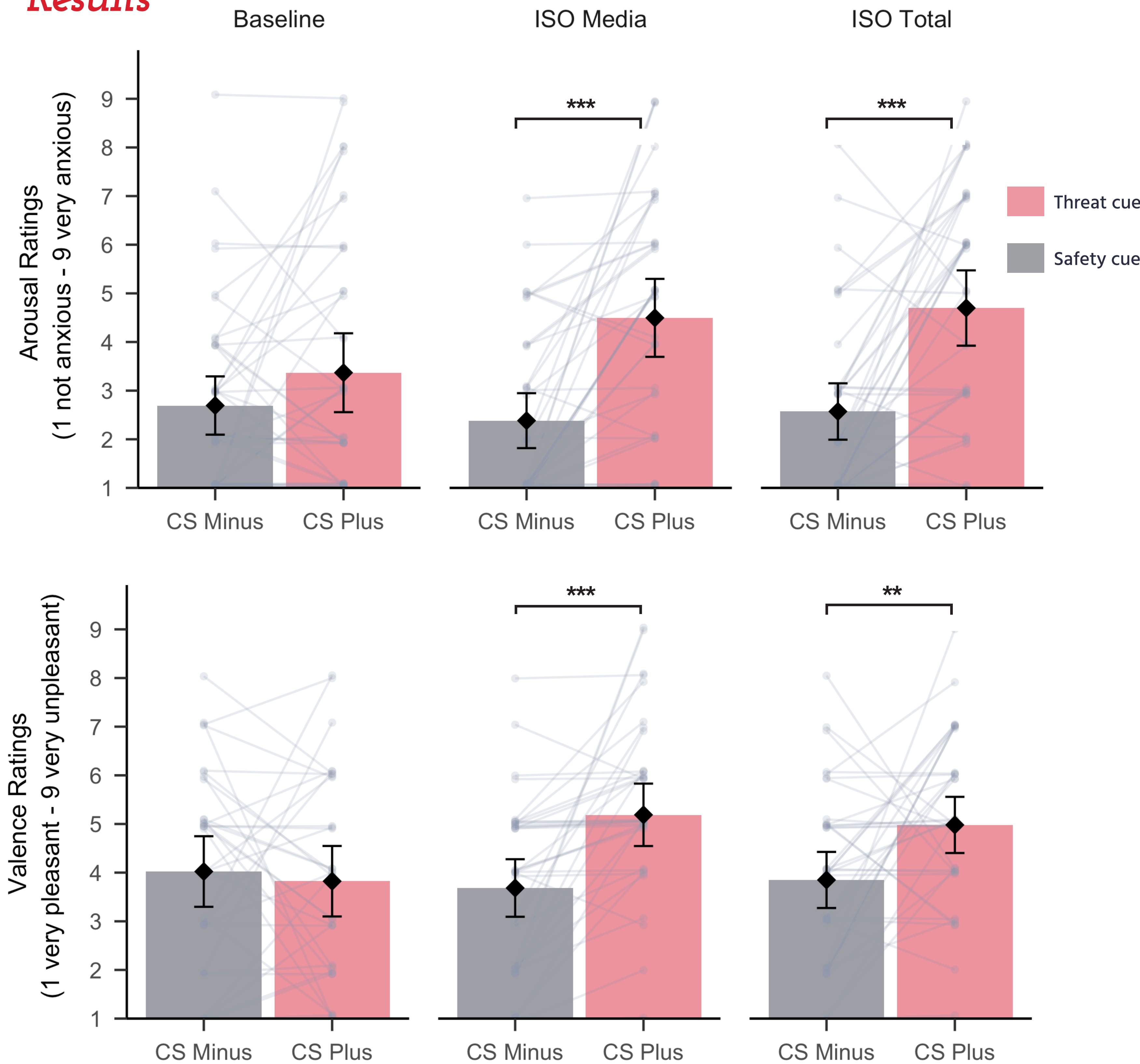
Social isolation associated with increased fear learning in adolescents

Emily Towner,
Livia Tomova, Kirsten Thomas,
& Sarah-Jayne Blakemore

Department of Psychology
University of Cambridge, UK

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Results



Social isolation is associated with increased fear learning relative to baseline.

There is an interaction such that the threat cue (CS+) was rated significantly more anxiety provoking ($p < .01$) and unpleasant ($p < .01$) compared to the safety cue (CS-) in both isolation sessions compared to baseline (controlling for sex/gender, age, and IQ [MaRs-IB⁸]).

There are no differences in arousal or valence ratings to either cue between isolation sessions (ISO-total versus ISO-media).

Discussion

These results suggest that even brief periods of social isolation can increase fear learning in human adolescents, and that virtual social interactions do not seem to remediate these effects.

Heightened fear learning could be one mechanism by which social isolation increases anxiety⁶.

Loneliness has been linked to mental health problems in adulthood⁹, and this experimental evidence suggests that heightened fear learning might be a pathway by which social isolation exerts long term negative effects on well-being during development.

Limitations

Baseline was always completed first - potential practise effects

However, there were no statistically significant differences in valence or arousal ratings between sessions 2 and 3 (whether ISO-total or ISO-media was session 2 or 3 was counterbalanced between participants), suggesting this is not due to practise effects.