Table 1: Candidate mediator constructs and how they were measured.

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| --- | --- | --- | --- |
| **Domain (Abbreviation)** | **Measurement tool** | **Tool type** | **Candidate mediator constructs** |
| 1. Attention bias to threat (AB) | Dot Probe task | Behavioral task | * Difference in reaction times on accurate trials with neutral faces vs angry faces |
| 2. Implicit emotion regulation (IER) | Emotional Stroop task | Behavioral task | * Adaptation to emotional conflict - the difference in reaction times on incongruent trials that were preceded by congruent trials and reaction times on incongruent trials preceded by incongruent trials * Difference in reaction time on incongruent vs congruent correct fear trials * Difference in reaction times on incongruent vs congruent correct happy trials |
| 3. Theory of mind (ToM) | Theory of Mind task | Behavioral task | * Accuracy on affective trials * Accuracy on cognitive trials |
| 4. Fear conditioning (FC) | Fear conditioning task | Physiologic response | * Difference between skin conductance response to CS+ and CS- in the first acquisition block of the task, adjusted for baseline conductance |
| 5. Pubertal timing (PT) | Tanner staging | Self-report | * Mean of testes/scrotum/penis & pubic hair development stages for biologically male participants and mean of breast and pubic hair development stages for biologically female participants |
| 6. Inhibitory control (IC) | NEPSY Circles and Squares task | Behavioral task | * Reaction times relative to baseline on "inhibit" trials * Reaction times relative to baseline on "switch" trials |
| Stroop task | Behavioral task | * Accuracy on all trials |
| 7. Language ability (LA) | Wechsler Abbreviated Scale of Intelligence | Behavioral task | * T-score on the vocabulary subset |
| 8. Reasoning ability (RA) | Wechsler Abbreviated Scale of Intelligence | Behavioral task | * T-score on the matrix reasoning subset |
| 9. Reward sensitivity (RS) | Piñata task | Behavioral task | * Difference in reaction time on no-reward (0-star) trials and reaction time on high-reward (4-star) * Overall performance (total stars earned) |
|  | | | |  |

Table 2: Product-moment correlations between threat, deprivation, candidate mediators and adolescent psychopathology outcomes.

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| --- | --- | --- | --- | --- |
|  | Adversity | | Psychopathology | |
|  | Threat | Deprivation | Internalizing | Externalizing |
| Threat | 1 |  | 0.22\*\*\* | 0.35\*\*\* |
| Deprivation | 0.32\*\*\* | 1 | 0.29\*\*\* | 0.30\*\*\* |
| AB: Attention bias threat | -0.01 | -0.02 | 0.02 | -0.03 |
| IER: Adaptation to emotional conflict | 0.03 | 0.05 | -0.03 | 0.02 |
| IER: Stroop - fear | -0.12 | 0.08 | -0.02 | -0.02 |
| IER: Stroop - happy | -0.05 | -0.03 | 0.01 | -0.02 |
| ToM: Accuracy on affective trials | -0.13\* | -0.19\*\* | -0.05 | -0.13 |
| ToM: Accuracy on cognitive trials | -0.17\* | -0.18\*\* | -0.10 | -0.16\* |
| FC: SCR to CS+ vs CS- | 0.08 | 0.02 | 0.03 | 0.09 |
| PT: Tanner stage | -0.05 | -0.09 | 0.15\* | 0.13\* |
| IC: Reaction time on inhibit trials | 0.14\* | -0.01 | 0.00 | 0.04 |
| IC: Reaction time on switch trials | 0.09 | 0.04 | 0.09 | 0.09 |
| IC: Accuracy on Stroop task | -0.10 | -0.02 | -0.03 | -0.08 |
| LA: Language ability | -0.14\* | -0.26\*\*\* | -0.01 | -0.07 |
| RA: Reasoning ability | -0.18\*\* | -0.13\* | -0.08 | -0.14\* |
| RS: Reaction time no- vs high-reward trials | -0.16\* | -0.07 | -0.21\*\* | -0.12 |
| RS: Total stars | -0.04 | -0.08 | -0.06 | -0.22\*\* |
| Latent Internalizing symptoms |  |  | 1 | 0.72\*\*\* |
| Latent Externalizing symptoms |  |  |  | 1 |
| AB=Attention bias to threat; IER=Emotion regulation; ToM=Theory of Mind; FC=Fear conditioning; PT=Pubertal timing; IC=Inhibitory control; LA=Language ability; RA=Reasoning ability; RS=Reward sensitivity  p-value \*\*\*<0.001, \*\*<0.01, \*<0.05 | | | | |
|  |

Table 3: Product-moment correlations among candidate mediators

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | (1) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| (1) AB: Attention bias threat | 1 | (2) |  |  |  |  |  |  |  |  |  |  |  |  |  |
| (2) ER: Adaptation to emotional conflict | -0.04 | 1 | (3) |  |  |  |  |  |  |  |  |  |  |  |  |
| (3) ER: Stroop - fear | -0.07 | -0.02 | 1 | (4) |  |  |  |  |  |  |  |  |  |  |  |
| (4) ER: Stroop - happy | 0.08 | 0.01 | 0.18\*\* | 1 | (5) |  |  |  |  |  |  |  |  |  |  |
| (5) ToM: Accuracy on affective trials | 0.03 | 0 | 0.03 | 0.08 | 1 | (6) |  |  |  |  |  |  |  |  |  |
| (6) ToM: Accuracy on cognitive trials | 0.09 | -0.09 | -0.03 | 0 | 0.59\*\*\* | 1 | (7) |  |  |  |  |  |  |  |  |
| (7) FC: SCR to CS+ vs CS- | -0.04 | 0.02 | -0.02 | 0.03 | 0.11 | 0.09 | 1 | (8) |  |  |  |  |  |  |  |
| (8) PT: Tanner stage | -0.02 | -0.01 | 0.1 | -0.02 | 0.01 | 0.03 | 0.07 | 1 | (9) |  |  |  |  |  |  |
| (9) AL: Language ability | 0.22\*\* | 0.13 | -0.12 | -0.05 | 0.08 | 0.15\* | -0.04 | -0.04 | 1 | (10) |  |  |  |  |  |
| (10) AR: Reasoning ability | 0.20\* | 0.05 | -0.01 | 0.1 | 0.04 | 0.12 | -0.04 | -0.01 | 0.42\*\*\* | 1 | (11) |  |  |  |  |
| (11) IC: Reaction time on inhibit trials | -0.08 | -0.12 | 0.07 | -0.07 | -0.02 | 0.12 | -0.09 | -0.02 | -0.13 | -0.17\*\* | 1 | (12) |  |  |  |
| (12) IC: Reaction time on switch trials | -0.08 | -0.01 | 0.09 | -0.04 | 0 | 0.02 | -0.11 | 0.06 | -0.11 | -0.12 | 0.43\*\*\* | 1 | (13) |  |  |
| (13) IC: Accuracy on Stroop task | 0.15\* | 0.09 | 0.11 | 0.01 | 0.08 | 0.06 | 0.13 | 0.06 | 0.32\*\*\* | 0.17\*\* | -0.18\*\* | -0.31\*\*\* | 1 | (14) |  |
| (14) RS: Reaction time no- vs high-reward trials | 0.07 | 0.05 | 0.04 | 0.04 | 0.02 | 0.07 | 0.07 | -0.08 | 0.02 | 0.08 | 0.13\* | 0.13\* | -0.07 | 1 | (15) |
| (15) RS: Total stars | 0.13\* | 0.04 | 0.06 | 0.04 | -0.01 | 0.01 | -0.01 | 0.02 | 0.16 | 0.16\* | -0.03 | -0.10 | 0.29\*\*\* | -0.03 | 1 |

p-value \*\*\*<0.001, \*\*<0.01, \*<0.05

Table 4: High-dimensional mediation (HIMA) results

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| --- | --- | --- | --- | --- | --- | --- |
|  | Adversity | Mediator | Adversity-Psychopathology a | Adversity-  Mediator a | Mediator-Psychopathology b | BH-corrected  p-value |
| Standardized β (95% CI) | Standardized β (95% CI) | Standardized β (95% CI) |
| Internalizing | Threat | PT: Tanner stage | 0.22(0.09,0.35)\*\* | -0.01(-0.13,0.11) | 0.19(0.06,0.32)\*\* | 0.8319 |
| Threat | RS: Reaction time on no- vs high-reward trials | 0.22(0.09,0.35)\*\* | -0.20(-0.33,-0.07)\*\* | -0.15(-0.27,-0.03)\* | 0.0209 |
| Deprivation | PT: Tanner stage | 0.34(0.2,0.48)\*\*\* | -0.12(-0.25,0.01) | 0.19(0.06,0.32)\*\* | 0.0970 |
| Deprivation | RS: Reaction time on no- vs high-reward trials | 0.34(0.2,0.48)\*\*\* | -0.12(-0.26,0.02) | -0.15(-0.27,-0.03)\* | 0.0970 |
| Externalizing | Threat | PT: Tanner stage | 0.31(0.18,0.44)\*\*\* | -0.01(-0.13,0.11) | 0.21(0.08,0.34)\*\* | 0.8319 |
| Threat | RS: Total stars | 0.31(0.18,0.44)\*\*\* | -0.02(-0.15,0.11) | -0.19(-0.31,-0.07)\*\* | 0.8319 |
| Deprivation | PT: Tanner stage | 0.28(0.14,0.42)\*\*\* | -0.12(-0.25,0.01) | 0.21(0.08,0.34)\*\* | 0.1369 |
| Deprivation | RS: Total stars | 0.28(0.14,0.42)\*\*\* | -0.04(-0.19,0.11) | -0.19(-0.31,-0.07)\*\* | 0.6199 |
| p-value \*\*\*<0.001, \*\*<0.01, \*<0.05 | | |  |  |  |  |
| a Adjusted for age, biological sex, early life poverty chronicity, and maternal depression | | | | |  |  |
| b Adjusted for threat, deprivation, age, biological sex, early life poverty chronicity, and maternal depression | | | | | |  |
| Standardized beta coefficients represent the change in the outcome associated with a 1-SD change in the predicting variable | | | | | |  |
| BH=Benjamini-Hochberg, preserving false discovery rate at 0.05 | | | |  |  |  |

Figure 1: Mediating pathway connecting threat to internalizing psychopathology via reward sensitivity.

Diagram

Description automatically generated

p-value \*\*\*<0.001, \*\*<0.01, \*<0.05