**Safe Haven Gratitude Improves Emotions, Well-Being, and Parenting Outcomes among Parents with High Levels of Attachment Insecurity: A Pre-Registered Experiment**

Online Supplement

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**Attachment Anxiety and Avoidance X Condition Effects on Post-Activity Measures**

 Attachment avoidance moderated the effects of security gratitude on feelings of competence (*b =* 0.21, *SE* = 0.07, *p* = .004). Security gratitude led to more competence at high levels of attachment avoidance (*b* = 0.22, *SE* = 0.10, *p* = .027) and marginally less competence at low levels of attachment avoidance (*b* = -0.19, *SE* = 0.10, *p* = .067). Effects of security gratitude at average levels of avoidance were not significant (*b* = 0.02, *SE =* 0.07, *p* = .74). Attachment avoidance did not moderate the effects of general gratitude on feelings of competence (*b* = 0.10, *SE =* 0.07, *p* = .178).

Attachment anxiety marginally moderated the effects of security gratitude on PRFQ prementalizing (*b* = 0.14, *SE* = 0.08, *p* = .086). Security gratitude led to greater prementalizing at high levels of attachment anxiety (*b* = 0.33, *SE* = 0.14, *p* = .021), but not low or average levels of attachment anxiety (*b*s < 0.15, *ps* > .13). Attachment anxiety did not moderate the effects of general gratitude on PRFQ prementalizing (*b* = 0.10, *SE* = 0.08, *p* = .21).

Attachment anxiety marginally moderated the effects of security gratitude on PRFQ certainty about mental states (*b* = 0.16, *SE* = 0.09, *p* = .063). Security gratitude led to marginally less PRFQ certainty about mental states at low levels of attachment anxiety (*b* = -0.27, *SE* = 0.16, *p* = .099), but not at a low or average levels of attachment anxiety (*b*s < 0.16, *p*s > .32). Attachment anxiety did not moderate the effects of general gratitude on PRFQ certainty about mental states (*b* = 0.02, *SE* = 0.08, *p* = .769).

Attachment anxiety marginally moderated the effects of security gratitude on PRFQ interest and curiosity about mental states (*b* = -0.12, *SE* = 0.07, *p* = .097). Security gratitude led to marginally less interest and curiosity in mental states at high levels of attachment anxiety (*b* = -0.22, *SE* = 0.13, *p* = .097), but not at low or average levels of attachment anxiety (*b*s < 0.10, *p*s > .47). Attachment anxiety did not moderate the effects of general gratitude on interest and curiosity in mental states (*b =* -0.01, *SE* = 0.07, *p* = .89).

Attachment insecurity did not moderate the effects of either gratitude activity on any of the other post-activity outcomes (*b*s < 0.19, *ps* > .10).

**Effects of Gratitude on Emotions Felt During Caregiving**

We evaluated whether the two gratitude activities predicted emotions felt during caregiving relative to parents’ other daily activities as described in the DRM at follow-up. We tested these hypotheses using multilevel modeling to account for repeated measurements (i.e., episodes) within individuals (Singer & Willett, 2003). Each episode was dummy-coded to reflect whether it involved caregiving (caregiving=1, all other activities=0). To test our hypotheses, we included the dummy-coded caregiving variable as a Level 1 (within-person) predictor and dummy-coded variables for the two gratitude conditions (control group as reference) as between-person predictors (Level 2) of both intercept and slope.

The three conditions did not differ positive emotions, empathic emotions, or meaning felt during caregiving relative to non-caregiving episodes |γs|<0.12, *ps>*.44. Contrary to our hypotheses, however, parents who practiced general gratitude reported greater negative emotions than control during caregiving relative to non-caregiving episodes, γ12=0.14, *SE=*0.06, *p=*.02.

**Attachment Anxiety and Avoidance X Condition Effects on Emotions During Caregiving**

Next, we evaluated whether attachment anxiety and avoidance moderated the effects of the gratitude activities on positive emotions, negative emotions, empathic emotions, and meaning during caregiving relative to parents’ other daily activities as described in the DRM at the 5-day follow-up using multilevel modeling (Singer & Willett, 2003). Each episode was dummy-coded to reflect whether it involved caregiving (caregiving=1, all other activities=0). Attachment anxiety and avoidance were mean centered prior to analysis. To test our hypotheses, we included the dummy-coded caregiving variable as a Level 1 (within-person) predictor, dummy-coded variables for the two gratitude conditions (control group as reference) as between-person predictors (Level 2), attachment anxiety and avoidance as between-person predictors (Level 2), and the interactions between attachment anxiety and gratitude conditions and between attachment avoidance and gratitude conditions as between person predictors (Level 2). All variables were included as predictors of both intercept and slope.

In models including caregiving, attachment anxiety, attachment avoidance, gratitude conditions, and interactions between attachment anxiety and gratitude conditions, and between attachment avoidance and gratitude conditions, attachment anxiety did not moderate the effects of either general gratitude or safe haven gratitude on negative emotions or any of the other outcomes in the DRM (see Table 2).

By contrast, attachment avoidance moderated the effects of both safe haven gratitude, γ17=0.36, *SE=*0.16, *p=*.024, and general gratitude, γ18=0.41, *SE=*0.19, *p=*.028, on positive emotions during caregiving (Table 2). Analyses of the simple slopes revealed that safe haven gratitude, γ11=-0.42, *SE=*0.21, *p=*.046, and general gratitude, γ12=-0.49, *SE=*0.23, *p=*.032, each led to lower positive emotions during caregiving for parents with low levels of attachment avoidance (1 *SD* below the mean), but not for parents with average or high (1 *SD* above the mean), |γs|<0.33, *ps>*.18.

Attachment avoidance did not moderate the effects of safe haven gratitude or general gratitude on negative emotions, empathic emotions, or meaning in life during caregiving (see Table 2).

**Table S1**

Correlations among all primary study variables

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 1.  | 2.  | 3.  | 4.  | 5.  | 6. | 7. | 8. | 9. | 10. | 11. | 12. | 13.  | 14.  | 15.  | 16. |
| 1. Attachment Avoidance | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2. Attachment Anxiety  | .46 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3. T1 Positive Emotions  | -.29 | -.29 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 4. T1 Negative Emotions  | .34 | .45 | -.36 | -- |  |  |  |  |  |  |  |  |  |  |  |  |
| 5. T1 Empathic Emotions  | -.25 | -.17 | .75 | -.09 | -- |  |  |  |  |  |  |  |  |  |  |  |
| 6. T1 Meaning  | -.39 | -.44 | .62 | -.50 | .45 | -- |  |  |  |  |  |  |  |  |  |  |
| 7. T1 Autonomy  | -.42 | -.48 | .40 | -.48 | .23 | .52 | -- |  |  |  |  |  |  |  |  |  |
| 8. T1 Competence  | -.33 | -.51 | .40 | -.45 | .22 | .52 | .61 | -- |  |  |  |  |  |  |  |  |
| 9. T1 Connectedness  | -.53 | -.61 | .53 | -.58 | .37 | .65 | .63 | .60 | -- |  |  |  |  |  |  |  |
| 10. T1 Subjective Happiness  | -.37 | -.50 | .54 | -.39 | .35 | .63 | .56 | .60 | .63 | -- |  |  |  |  |  |  |
| 11. T1 Parenting Satisfaction | -.28 | -.37 | .33 | -.33 | .19 | .41 | .40 | .48 | .48 | .49 | -- |  |  |  |  |  |
| 12. T1 PRFQ Pre-Mentalizing | .26 | .37 | -.12 | .39 | -.10 | -.21 | -.32 | -.39 | -.38 | -.24 | -.46 | -- |  |  |  |  |
| 13. T1 PRFQ Certainty  | -.17 | -.17 | .22 | -.04 | .16 | .18 | .24 | .29 | .25 | .30 | .38 | -.07 | -- |  |  |  |
| 14. T1 PRFQ Interest | -.13 | .05 | .11 | -.07 | .14 | .15 | .07 | .13 | .12 | .08 | .19 | -.38 | .04 | -- |  |  |
| 15. T2 Positive Emotions  | -.15 | -.15 | .46 | -.01 | .41 | .28 | .15 | .24 | .22 | .39 | .27 | -.03 | .20 | .10 | -- |  |
| 16. T2 Negative Emotions  | .32 | .36 | -.19 | .52 | -.08 | -.34 | -.39 | -.33 | -.44 | -.30 | -.21 | .35 | -.01 | -.11 | -.06 | -- |
| 17. T2 Empathic Emotions  | -.05 | .06 | .34 | .10 | .40 | .16 | .05 | .12 | .09 | .25 | .14 | .02 | .14 | .08 | .85 | .18 |
| 18. T2 Meaning  | -.15 | -.17 | .35 | -.07 | .33 | .36 | .25 | .32 | .25 | .41 | .29 | -.06 | .28 | .06 | .72 | -.08 |
| 19. T2 Positive Child Behavior | -.17 | -.21 | .17 | -.21 | .12 | .23 | .16 | .21 | .23 | .24 | .46 | -.39 | .12 | .33 | .21 | -.27 |
| 20. T2 Negative Child Behavior  | .20 | .29 | -.18 | .31 | -.04 | -.21 | -.22 | -.29 | -.33 | -.25 | -.44 | .40 | -.15 | -.14 | -.10 | .39 |
| 21. T2 Child Maladjustment | .20 | .33 | -.15 | .26 | -.07 | -.15 | -.23 | -.29 | -.32 | -.27 | -.45 | .42 | -.16 | -.15 | -.05 | .35 |
| 22. T2 Parent Overcontrol | .18 | .25 | -.001 | .26 | -.06 | -.07 | -.12 | -.22 | -.23 | -.10 | -.28 | .55 | .09 | -.31 | -.01 | .36 |

*Note. N* = 614 for correlations among baseline variables (1-14). *N* = 424 for correlations including follow-up variables (15-22). For baseline correlations (*N*  = 614) |r| = .08 *p* = .038, |r| = .11, *p* = .01, |r| = .13, *p* = .001. For correlations including follow-up variables (*N* = 424),|r| = .10, *p* = .04 |r| = .15,  *p* = .002, |r| = .16, *p*  =.001.

**Table S1 (Continued)**

Correlations among all primary study variables

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | 17. | 18. | 19. | 20. | 21. |
| 17. T2 Emp. Emotions  | -- |  |  |  |  |
| 18. T2 Meaning  | .64 | -- |  |  |  |
| 19. T2 Pos. Child Beh. | .13 | .20 | -- |  |  |
| 20. T2 Neg. Child Beh.  | .01 | -.13 | -.51 | -- |  |
| 21. T2 Child Maladjust.  | .06 | -.10 | -.50 | .74 | -- |
| 22. T2 Parent Overcon. | .06 | .03 | -.28 | .33 | .40 |

*Note. N* = 614 for correlations among baseline variables (1-14). *N* = 424 for correlations including follow-up variables (15-22). For baseline correlations (*N*  = 614) |r| = .08 *p* = .038, |r| = .11, *p* = .01, |r| = .13, *p* = .001. For correlations including follow-up variables (*N* = 424),|r| = .10, *p* = .04 |r| = .15,  *p* = .002, |r| = .16, *p*  =.001.

**Table S2**

Multilevel models predicting emotions during caregiving vs. non-caregiving episodes by attachment anxiety, attachment avoidance, and condition

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | Positive Emotions  | Negative Emotions  | Empathic Emotions  | Meaning  |
| Effect  | Parameter  |  |  |  |  |
| Intercept, πoi  | γ00 | 3.56\*\*\* (0.10)  | 1.64\*\*\* (0.06)  | 2.84\*\*\* (0.11)  | 3.85\*\*\* (0.12)  |
| Safe Haven Gratitude  | γ01 | 0.18 (0.15)  | -0.08 (0.09)  | 0.04 (0.16)  | 0.13 (0.17)  |
| General Gratitude  | γ02 | -0.02 (0.15)  | -0.06 (0.09)  | -0.03 (0.15)  | 0.02 (0.16)  |
| Attachment Anxiety  | γ03 | -0.14+ (0.09)  | 0.18\*\*\* (0.05)  | -0.10 (0.09)  | -0.19\* (0.10)  |
| Attachment Avoidance | γ04 | -0.15 (0.13) | 0.22\*\* (0.08) | 0.02 (0.14) | -0.19 (0.15) |
| Safe Haven Gratitude x Anxiety  | γ05 | 0.13 (0.14)  | -0.03 (0.08)  | 0.17 (0.14)  | 0.10 (0.15)  |
| General Gratitude x Anxiety  | γ06 | 0.06 (0.13)  | -0.04 (0.08)  | 0.02 (0.13)  | 0.15 (0.14)  |
| Safe Haven Gratitude x Avoidance  | γ07 | 0.07 (0.18)  | -0.11 (0.11) | -0.04 (0.19) | 0.25 (0.20) |
| General Gratitude x Avoidance  | γ08 | -0.08 (0.18) | -0.09 (0.11) | -0.15 (0.19) | -0.09 (0.21) |
| Slope, π1i  |  |  |  |  |  |
| Caregiving  | γ10 | 0.81\*\*\* (0.09)  | -0.07+ (0.04)  | 1.31\*\*\* (0.10)  | 1.03\*\*\* (0.10)  |
| Safe Haven Gratitude  | γ11 | -0.06 (0.14)  | 0.07 (0.05)  | 0.03 (0.15)  | -0.05 (0.15)  |
| General Gratitude  | γ12 | -0.08 (0.18)  | 0.13\* (0.06)  | -0.10 (0.16)  | -0.11 (0.16)  |
| Attachment Anxiety  | γ13 | 0.02 (0.08)  | -0.02 (0.03)  | 0.02 (0.09)  | 0.06 (0.09)  |
| Attachment Avoidance  | γ14 | -0.19+ (0.12)  | 0.002 (0.05) | -0.11 (0.13) | -0.15 (0.13) |
| Safe Haven Gratitude x Anxiety  | γ15 | -0.13 (0.13)  | 0.01 (0.05)  | -0.11 (0.14)  | -0.11 (0.14)  |

**Table 2 (continued)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | Positive Emotions  | Negative Emotions  | Empathic Emotions  | Meaning  |
| General Gratitude x Anxiety  | γ16 | 0.003 (0.14)  | 0.10+ (0.05)  | 0.05 (0.14)  | -0.11 (0.14)  |
| Safe Haven Gratitude x Avoidance  | γ17 | 0.36\* (0.16) | 0.04 (0.06) | 0.21 (0.17) | 0.15 (0.17) |
| General Gratitude x Avoidance  | γ18 | 0.41\* (0.19) | -0.10 (0.07) | 0.24 (0.20) | 0.29 (0.20) |

*Note. +p<*.10, \**p<*.05, \*\**p*<.01, \*\* *p<*.001. Attachment anxiety and avoidance were centered prior to analysis. Experimental conditions were dummy-coded with Control as the reference group. Caregiving episodes were dummy-coded with non-caregiving as the reference group. γ00 represents the average emotions during non-caregiving episodes. γ01 reflects the difference in emotions during non-caregiving for Safe Haven Gratitude vs. Control. γ02 reflects the difference in emotions during non-caregiving for General Gratitude vs. Control. γ03 reflects the association between emotions and Attachment Anxiety during non-caregiving episodes for the Control condition. γ04 reflects the association between emotions and Attachment Avoidance during non-caregiving episodes for the Control condition. γ05 reflects the moderating role of Attachment Anxiety for the effect of Safe Haven Gratitude on emotions during non-caregiving episodes. γ06 reflects the moderating role of Attachment Anxiety for the effect of General Gratitude on emotions during non-caregiving episodes. γ07 reflects the moderating role of Attachment Avoidance for the effect of Safe Haven Gratitude on emotions during non-caregiving episodes. γ08 reflects the moderating role of Attachment Avoidance for the effect of General Gratitude on emotions during non-caregiving episodes. γ10 reflects the difference in emotions during caregiving vs. non-caregiving episodes for participants in the Control condition. γ11 and γ12 reflect the additional effects of Safe Haven Gratitude and General Gratitude, respectively, on emotions during caregiving. γ13 and γ14 reflects the additional effect of Attachment Anxiety and Attachment Avoidance, respectively, on emotions during caregiving. γ15 andγ16 reflect the moderating role of Attachment Anxiety for the effects of Safe Haven Gratitude and General Gratitude, respectively, on emotions during caregiving. γ17 andγ18 reflect the moderating role of Attachment Avoidance for the effects of Safe Haven Gratitude and General Gratitude, respectively, on emotions during caregiving.