Appendix Table 1. Within- and between-dyad model equations for emotion regulation and coregulation processes during mother-infant free play

Within-dyad equations

MP*ti* = α1*i* + φ1*i*MPc*(t-*1)*i* + φ4*i*IPc*(t-*1)*i*+ φ7*i*INc*(t-*1)*i*+ e1*ti*

IP*ti* = α2*i* + φ2MPc*(t-*1) + φ5*i*IPc(*t*-1)*i*+ φ8*i*INc(*t*-1)*i*+ e2*ti*

IN*ti* = α3*i* + φ3MPc*(t-*1) + φ6*i*IPc*(t-*1)*i*+ φ9*i*INc*(t-*1)*i*+ e3*ti*

Between-dyad equations

α1*i* = γ00 + γ01MRSAc*i* + γ02SDRSAc*i* + u0*i*

α2*i* = γ10 + γ11MRSAc*i* +γ12SDRSAc*i* +u1*i*

α3*i* = γ20 + γ21MRSAc*i* + γ22SDRSAc*i* + γ23COGc*i* + u2*i*

φ1*i*= γ30 + γ31MRSAc*i* + γ32SDRSAc*i* + u3*i*

φ2i = γ40 + γ41MRSAc*i* + γ42SDRSAc*i* + u4*i*

φ3i = γ50 + γ51MRSAc*i* + γ52SDRSAc*i* + γ53COGc*i* + u5*i*

φ4*i*= γ60 + γ61MRSAc*i* + γ62SDRSAc*i* + u6*i*

φ5*i*= γ70 + γ71MRSAc*i* + γ72SDRSAc*i* + u7*i*

φ6*i*= γ80 + γ81MRSAc*i* + γ82SDRSAc*i* + γ83COGc*i* + u8*i*

φ7*i*= γ90 + γ91MRSAc*i* + γ92SDRSAc*i* + γ93COGc*i* + u9*i*

φ8*i*= γ10,0 + γ10,1MRSAc*i* + γ10,2SDRSAc*i* + γ10,3COGc*i* + u10*i*

φ9*i*= γ11,0 + γ11,1MRSAc*i* + γ11,2SDRSAc*i* + γ11,3COGc*i* + u11*i*

= exp(ω00 + γ12,1MRSAc*i* + γ12,2SDRSAc*i* + u12*i*)

= exp(ω10 + γ13,1MRSAc*i* + γ13,2SDRSAc*i* + u13*i*)

= exp(ω20 + γ14,1MRSAc*i* + γ14,2SDRSAc*i* + u14*i*)

Covariances

**u***i* ~ MVN **(0**15, ![<math xmlns="http://www.w3.org/1998/Math/MathML"><mfenced open="[" close="]"><mtable><mtr><mtd><msubsup><mi>&#x3C4;</mi><mn>00</mn><mrow/></msubsup></mtd><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/></mtr><mtr><mtd><msubsup><mi>&#x3C4;</mi><mn>10</mn><mrow/></msubsup></mtd><mtd><msubsup><mi>&#x3C4;</mi><mn>11</mn><mrow/></msubsup></mtd><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/></mtr><mtr><mtd><msubsup><mi>&#x3C4;</mi><mn>20</mn><mrow/></msubsup></mtd><mtd><msubsup><mi>&#x3C4;</mi><mn>21</mn><mrow/></msubsup></mtd><mtd><msubsup><mi>&#x3C4;</mi><mn>22</mn><mrow/></msubsup></mtd><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/></mtr><mtr><mtd/><mtd/><mtd/><mtd><msubsup><mi>&#x3C4;</mi><mn>33</mn><mrow/></msubsup></mtd><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/></mtr><mtr><mtd/><mtd/><mtd/><mtd/><mtd><msubsup><mi>&#x3C4;</mi><mn>44</mn><mrow/></msubsup></mtd><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/></mtr><mtr><mtd/><mtd/><mtd/><mtd/><mtd/><mtd><msub><mi>&#x3C4;</mi><mn>55</mn></msub></mtd><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/></mtr><mtr><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd><msubsup><mi>&#x3C4;</mi><mn>66</mn><mrow/></msubsup></mtd><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/></mtr><mtr><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd><msubsup><mi>&#x3C4;</mi><mn>77</mn><mrow/></msubsup></mtd><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/></mtr><mtr><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd><msubsup><mi>&#x3C4;</mi><mn>88</mn><mrow/></msubsup></mtd><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/></mtr><mtr><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd><msubsup><mi>&#x3C4;</mi><mn>99</mn><mrow/></msubsup></mtd><mtd/><mtd/><mtd/><mtd/><mtd/></mtr><mtr><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd><msubsup><mi>&#x3C4;</mi><mrow><mn>10</mn><mo>,</mo><mn>10</mn></mrow><mrow/></msubsup></mtd><mtd/><mtd/><mtd/><mtd/></mtr><mtr><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd><msubsup><mi>&#x3C4;</mi><mrow><mn>11</mn><mo>,</mo><mn>11</mn></mrow><mrow/></msubsup></mtd><mtd/><mtd/><mtd/></mtr><mtr><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd><msubsup><mi>&#x3C4;</mi><mrow><mn>12</mn><mo>,</mo><mn>12</mn></mrow><mrow/></msubsup></mtd><mtd/><mtd/></mtr><mtr><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd><msubsup><mi>&#x3C4;</mi><mrow><mn>13</mn><mo>,</mo><mn>13</mn></mrow><mrow/></msubsup></mtd><mtd/></mtr><mtr><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd/><mtd><msubsup><mi>&#x3C4;</mi><mrow><mn>14</mn><mo>,</mo><mn>14</mn></mrow><mrow/></msubsup></mtd></mtr></mtable></mfenced></math>]() )

*Note*. MP = Maternal positive affect. IP = Infant positive affect. IN = Infant negative affect. MRSA = Within-infant mean of respiratory sinus arrhythmia (RSA) during free play. SDRSA = Within-infant standard deviation of RSA during free play. COG = Maternal country of origin (0 = Mexico, 1 = United States).

Appendix Figure 1. Individual differences in volatility in negative affect

*Note*. The gray line represents a time series for an infant with more volatility in negative affect. The black line represents a time series for an infant with less volatility in negative affect.

Appendix Figure 2. Differences in carryover in positive affect





*Note*. The horizontal lines represent the average value of positive affect for each person. The dots reflect the amount of positive affect, at each second that it was observed. The time series shown in the top panel exhibits a high level of positive carryover in positive affect (estimate = .904). The time series shown in the bottom panel exhibits a null amount of carryover in positive affect (estimate = -.003).

Appendix Table 2. Descriptions of infant and maternal positive and negative affect

|  |  |  |
| --- | --- | --- |
|  | Infant Positive Affect | Maternal Positive Affect  |
| Value |  |  |
| 0 | Showed negative affect  | Showed negative affect  |
| 1 | Positive facial/vocal affect, disengaged; Neutral or uncodable facial/vocal affect, passive engaged; Uncodable facial/vocal affect, active engaged | Positive facial/vocal, disengaged |
| 2 | Neutral facial/vocal affect, active engaged | Neutral or uncodable facial/vocal affect, passive engaged; Neutral or uncodable facial/vocal affect, comforting or active engaged; Positive facial/vocal affect, comforting engaged |
| 3 | Positive facial/vocal affect, passive engaged | Positive facial/vocal affect, passive engaged |
| 4 | Positive facial/vocal affect, active engaged | Positive facial/vocal affect, active engaged |
|  |
|  | Infant Negative Affect | Maternal Negative Affect  |
| Value |  |  |
| 0 | Showed positive affect | Showed positive affect  |
| 1 | Neutral facial/vocal affect, disengaged | Neutral facial/vocal affect, disengaged |
| 2 | Negative or uncodable facial/vocal affect, disengaged | Negative or uncodable facial/vocal affect, disengaged |
| 3 | Negative facial/vocal affect, passive engaged | Negative facial/vocal affect, passive engaged |
| 4 | Negative facial/vocal affect, active engaged | Negative facial/vocal affect, active engaged |

*Note*. Affect was treated as missing when engagement was not coded. No mothers expressed negative affect while engaged in comforting behavior.