

INTRODUCTION

The Still Face Paradigm (SFP)

- The SFP (Tronick et al., 1978) was designed to examine infant responses to social interaction cues by a parent, consisting of three phases: Free Play (FP), Still Face (SF), and Reunion (RU).
- The SFP is characterized by a decrease in positive affect and gaze, and an increase in negative affect during SF, with some recovery seen during RU (Mesman et al., 2009).
- Children with temperamental negative affect during SF show less recovery during RU (Braungart-Rieker et al., 1998; Mesman et al., 2009).

Mobile Device Use

- When parents use mobile devices in front of children, the parent is physically present but relatively distracted and unresponsive, analogous to the key components of SF.
- Increased mobile device use has been shown to be associated with increased anxiety (Reid & Reid, 2007; Sapacz, Rockman, & Clark, 2016).
- Using a cell phone as a metaphor for reduced parental interaction and withdrawn attention, a modified version of the SFP was used to assess the ways in which increased mobile device use might influence children's affect and social interaction with a parent.

AIMS

- Establish whether a modified SFP that incorporates maternal mobile device use can serve as an analog to the original SFP.
- Investigate how individual differences in child temperament and maternal emotional well-being can be used to predict child behaviors during the SFP.

METHOD

Participants

- Fifty-three children (27 female) ages 7.20 to 23.60 months ($M=15.17$, $SD=4.75$) participated in a modified Still Face Paradigm with their mothers.

Materials and Procedure

Questionnaires

- Mobile Device Use:** Self-report of parental mobile device use (daily hours of device use in front of family including child)
- The State Trait Anxiety Inventory (STAI;** Spielberger, 1983): self-report measure of parent trait anxiety
- Infant Behavior Questionnaire (IBQ;** Rothbart, 1981): parent report measure of child temperament for children aged 2-12 months
- Toddler Behavior Assessment Questionnaire (TBAQ;** Goldsmith, 1996): parent report measure of child temperament for children aged 12-36 months

The Modified Still Face Paradigm (SFP; Tronick et al., 1978)

- Behaviors performed by at least 25% of children in at least one phase were selected for analyses (negative affect, positive affect, toy engagement, engagement with mother, social bid, room exploration). For each child, average scores were computed for each behavior within each phase (FP, SF, RU).
- Reliability for 3 reliable coders was computed using Cohen's kappa, and ranged from .71 to .98 ($M=.85$, $SD=.03$).

Free Play Phase (FP; 5 Minutes): parent and child play and interact

Still Face Phase (SF; 2 Minutes): parent uses mobile device, withdraws attention from child and becomes unresponsive

Reunion Phase (RU; 1 Minute): parent resumes normal interaction with child



Engagement with Mother

Positive Affect

Toy Engagement

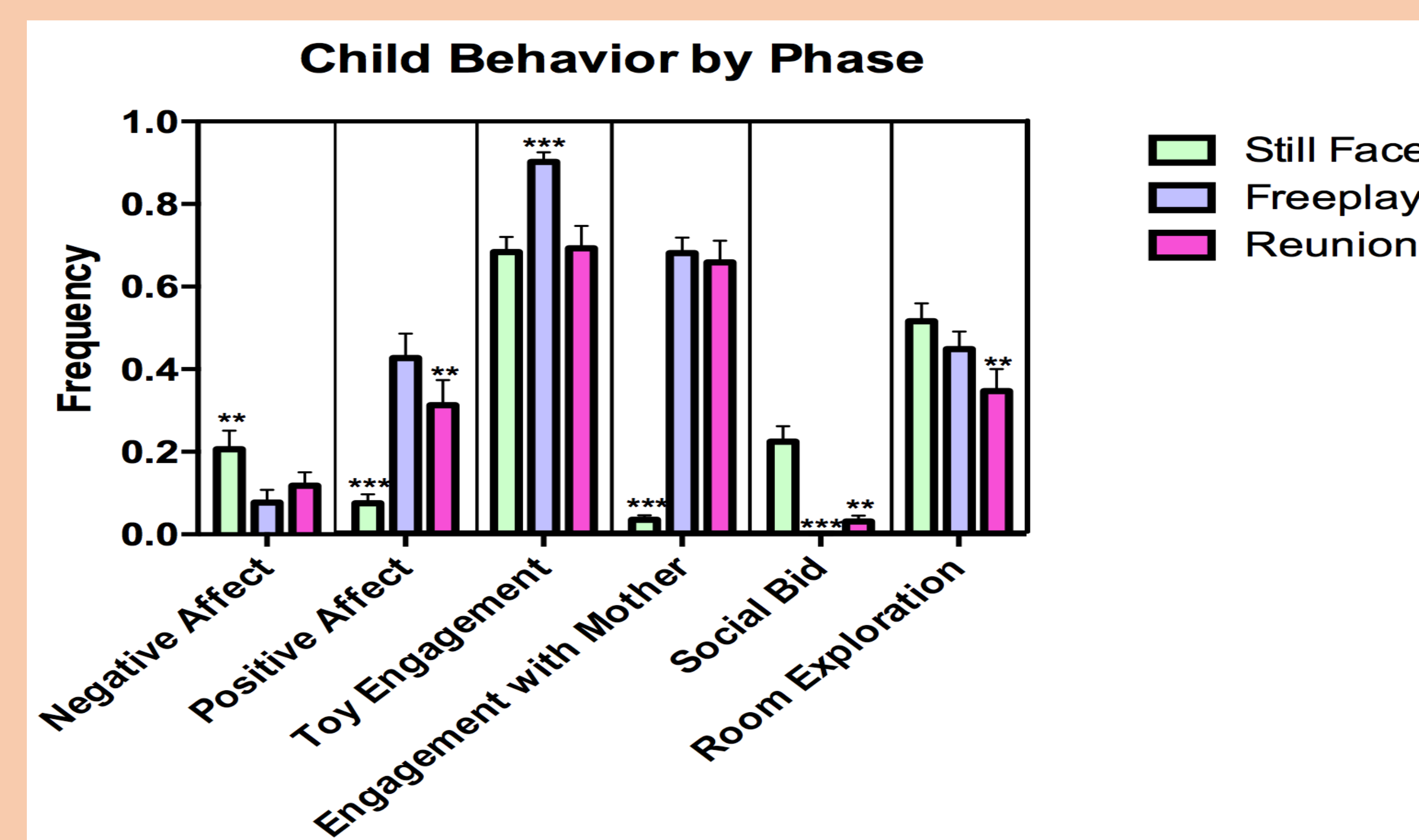
Table 1. Descriptive Statistics of Child Behaviors Performed during the Modified SFP

	Still Face <i>M (SD)</i>	Free Play <i>M (SD)</i>	Reunion <i>M (SD)</i>
Negative Affect	.21 (.31) ^{a***}	.08 (.22) ^b	.12 (.23) ^b
Positive Affect	.07 (.15) ^{a***}	.43 (.41) ^b	.31 (.42) ^{b***}
Toy Engagement	.68 (.25) ^a	.90 (.16) ^{b***}	.69 (.38) ^a
Engagement with Mother	.04 (.08) ^{a***}	.68 (.27) ^b	.66 (.37) ^b
Social Bid	.23 (.26) ^a	.001 (.01) ^{b***}	.03 (.10) ^{c***}
Room Exploration	.52 (.31) ^a	.45 (.30) ^{a,b}	.35 (.37) ^{b***}

Note. *** $p < .001$, ** $p < .05$; For each behavior, means that are not significantly different from each other share the same letter.

RESULTS

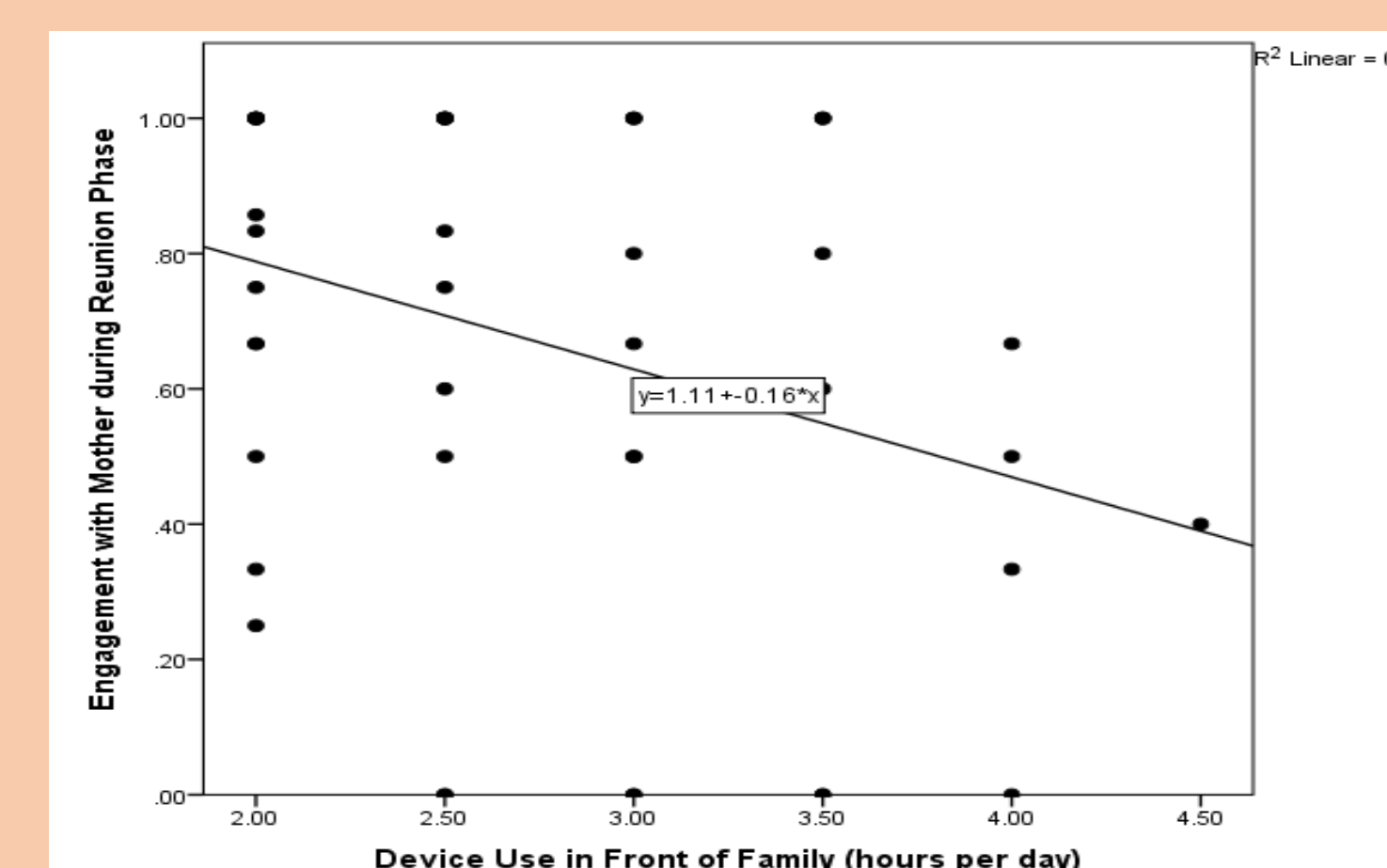
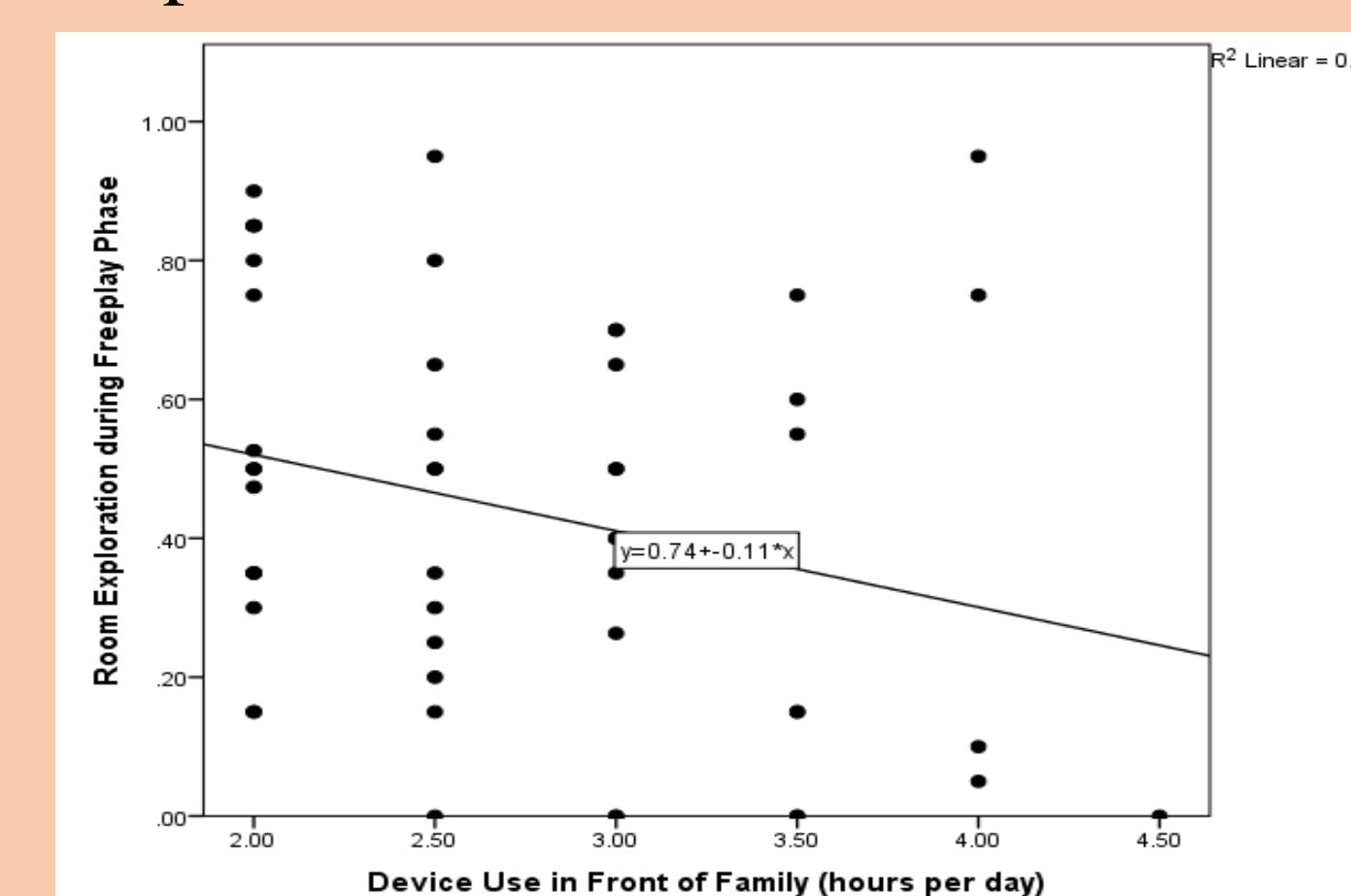
- To examine differences among the FP, SF, and RU phases, repeated-measures ANOVAs were conducted for each child behavior.
 - Mirroring the effects of the traditional SFP, children showed more negative affect and less positive affect during SF versus FP and RU.
 - Children also showed more toy engagement in FP than in SF or RU, and more engagement with mother during FP and RU than SF.
 - Children showed the most social bids during SF and more room exploration in SF than RU.



Note. *** $p < .001$, ** $p < .05$

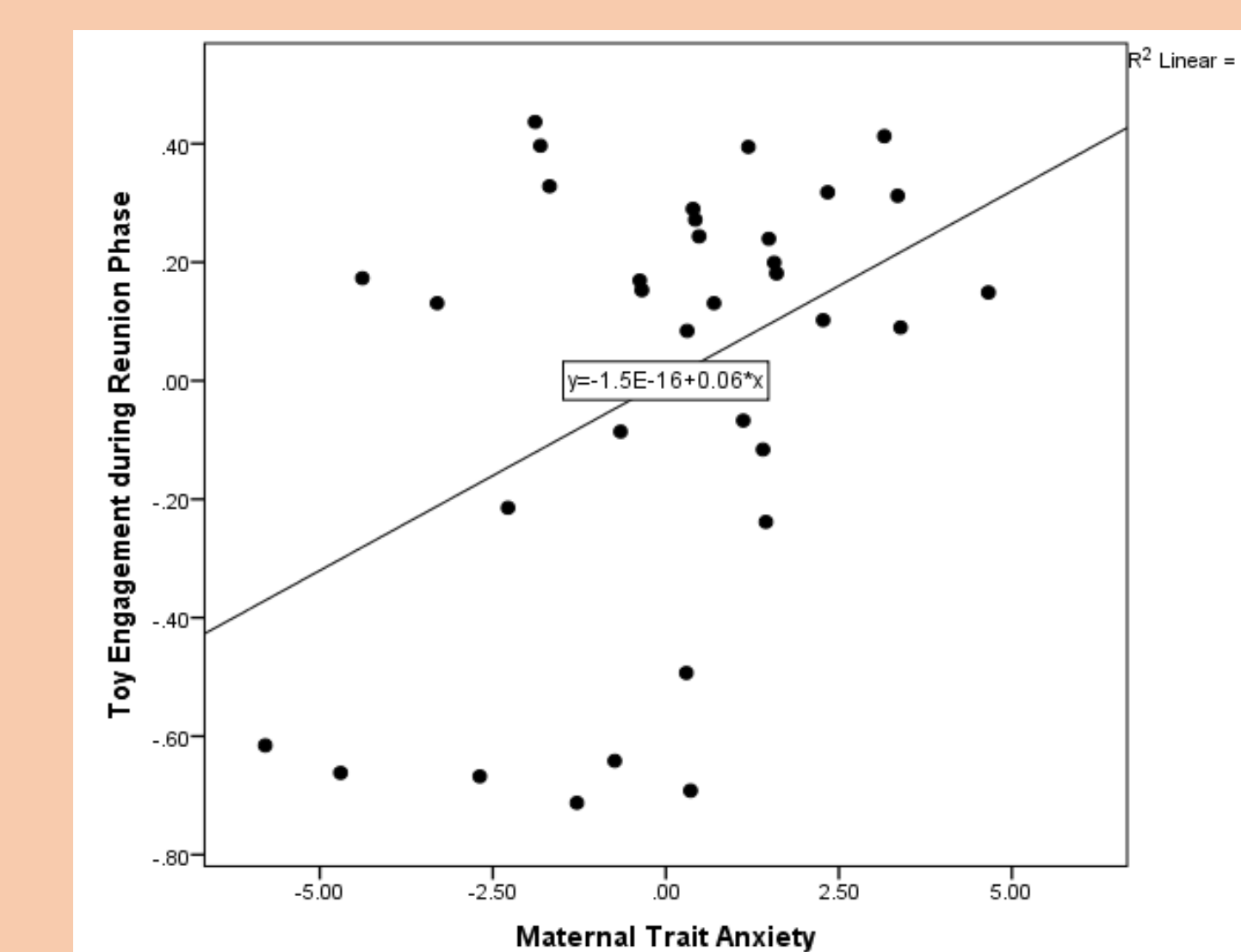
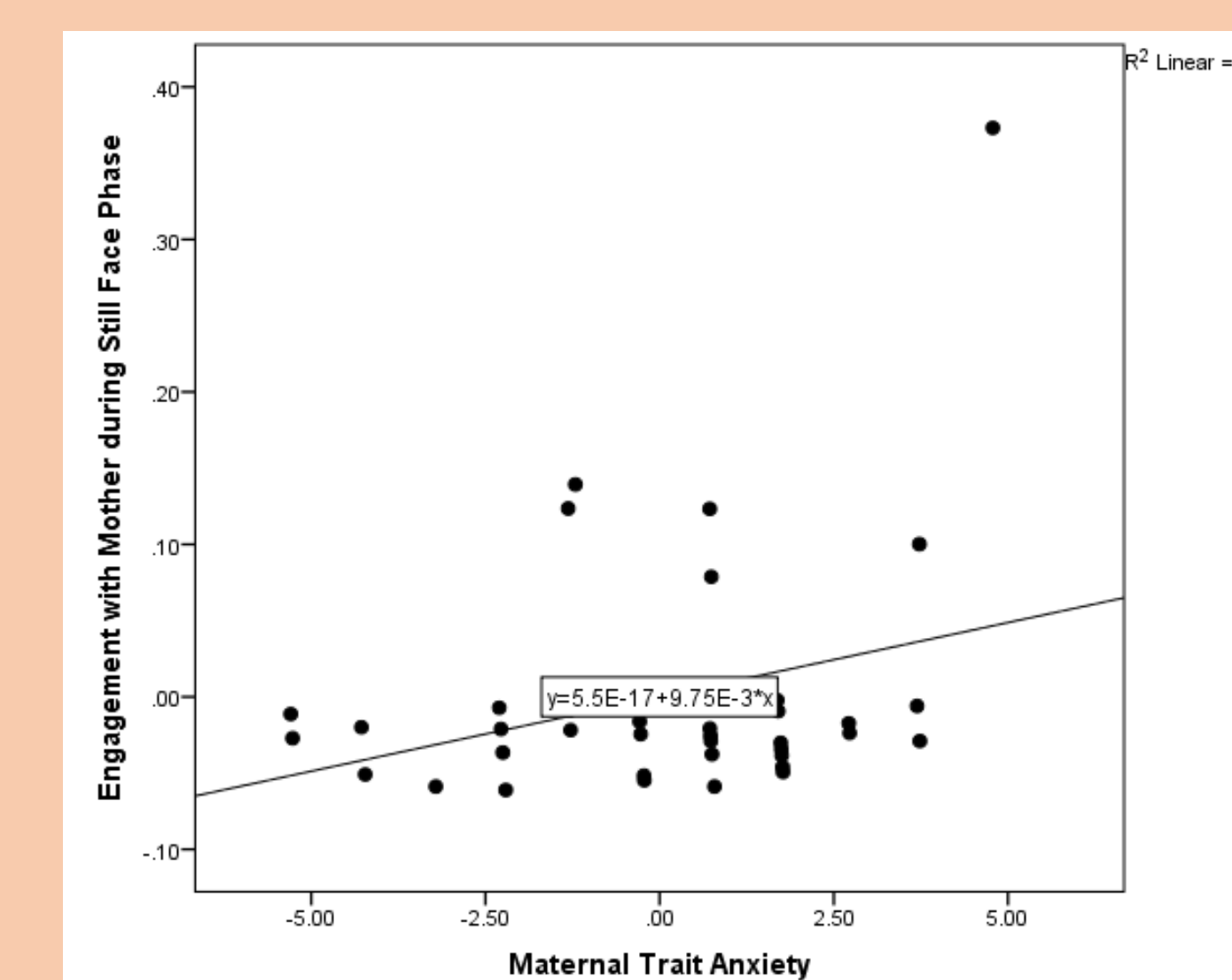
Maternal Mobile Phone Use and Child Behavior during Still Face Paradigm

- More frequent mobile device use in front of family was associated with less room exploration during FP than RU and SF, and less engagement with mother during RU compared to FP and SF.



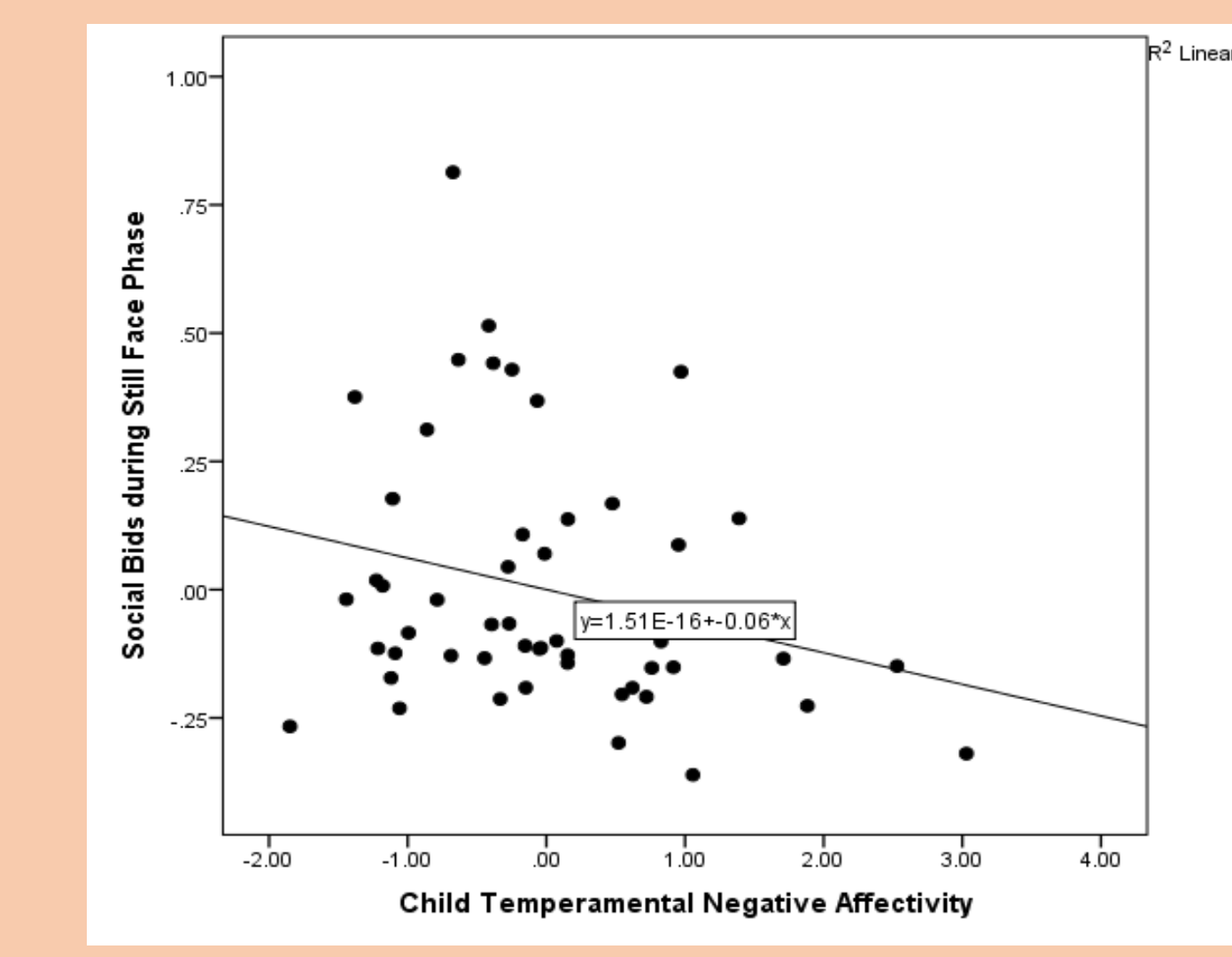
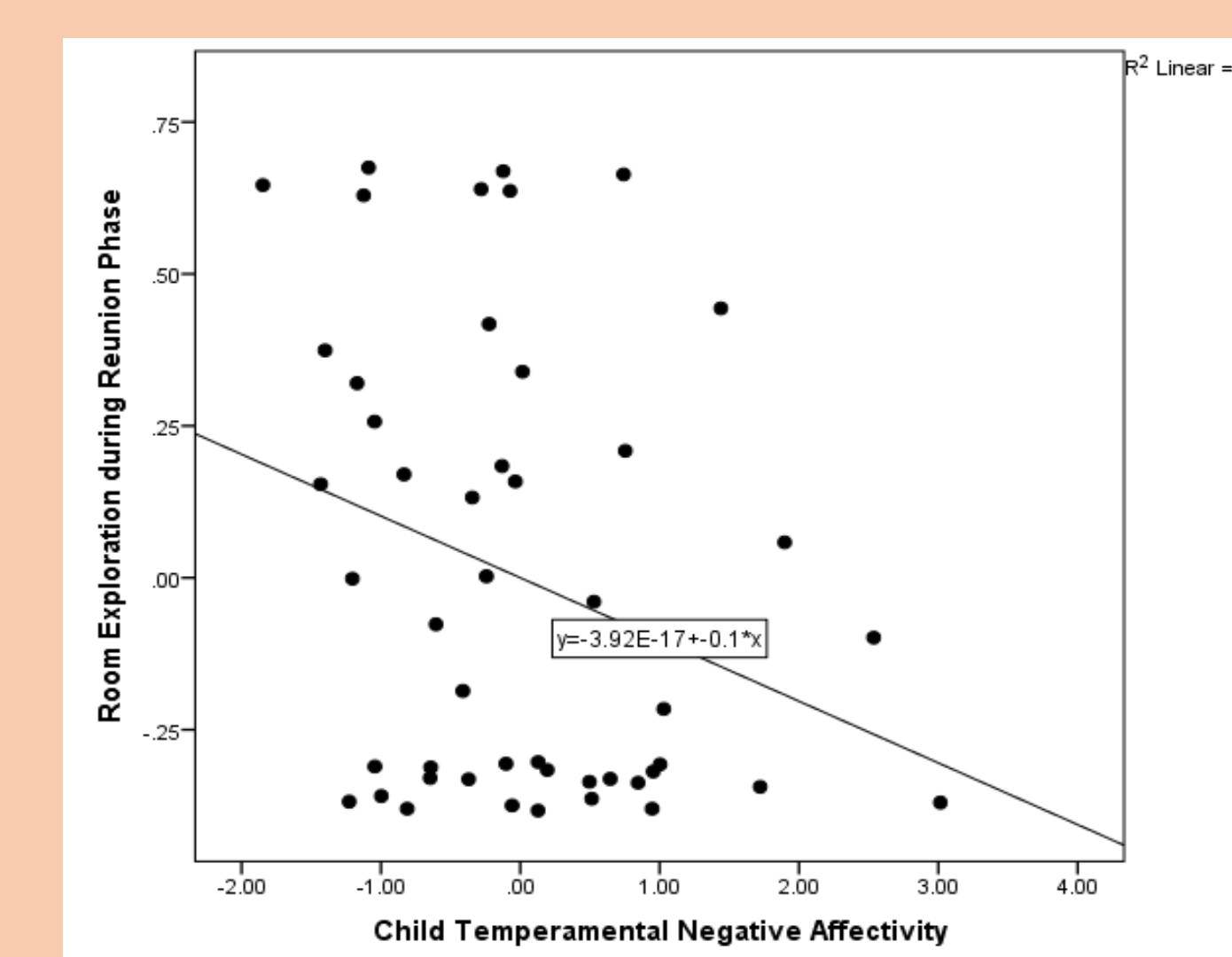
Maternal Anxiety and Child Behavior during Still Face Paradigm

- Linear regressions were conducted: 1st step = age in months; 2nd step = maternal trait anxiety; DV = child behavior during SFP.
- Greater maternal trait anxiety predicted greater engagement between child and mother during the SF despite instructions to refrain from interaction, and greater toy engagement during RU.



Child Temperament and Behavior during Still Face Paradigm

- Linear regressions were conducted: 1st step = age in months; 2nd step = child temperamental negative affectivity; DV = child behavior during SFP.
- Greater child temperamental negative affectivity predicted less use of social bids during SF, and less room exploration during RU.



DISCUSSION

- As predicted, the modified SFP using a mobile device produced the expected differences in child behavior between the three phases, indicating that the modified SFP can be considered an analog to the original SFP.
- Individual differences in maternal anxiety and child temperament predict behaviors during SFP phases:
 - Less room exploration and therefore less recovery during RU for children with higher temperamental negative affectivity
 - More maternal rule-breaking via interaction with child during SF for those with higher levels of maternal anxiety.
- The modified SFP represents a promising theoretical framework for understanding the impact of parent's mobile device use on child social-emotional functioning and parent-child interactions.

REFERENCES

Adamson, L. B., & Frick, J. E. (2003). The still face: A history of a shared experimental paradigm. *Infancy, 4*(4), 451-473.

Braungart-Rieker, J., Garwood, M. M., Powers, B. P., & Notaro, P. C. (1998). Infant affect and affect regulation during the still-face paradigm with mothers and fathers: The role of infant characteristics and parental sensitivity. *Developmental Psychology, 34*(6), 1428.

Goldsmith, H. H. (1996). Studying temperament via construction of the Toddler Behavior Assessment Questionnaire. *Child Development, 67*(1), 218-235.

Mesman, J., van IJzendoorn, M. H., & Bakermans-Kranenburg, M. J. (2009). The many faces of the still-face paradigm: a review and meta-analysis. *Developmental Review, 29*(2), 120-162.

Reid, D. J., & Reid, F. J. (2007). Text or talk? Social anxiety, loneliness, and divergent preferences for cell phone use. *CyberPsychology & Behavior, 10*(3), 424-435.

Rothbart, M. K. (1981). Measurement of temperament in infancy. *Child development, 569-578*.

Sapacz, M., Rockman, G., & Clark, J. (2016). Are we addicted to our cell phones? *Computers in Human Behavior, 57*, 153-159.

Spielberger, C. D. (1983). Manual for the State-Trait Anxiety Inventory STAI (form Y) ("self-evaluation questionnaire").

Tronick, E., Brazelton, T. B., & Als, H. (1978). The structure of face-to-face interaction and its developmental functions. *Sign Language Studies, 18*(1), 1-16.