

Sex Differences in the Association between Prenatal Second-hand Smoke Exposure and Infant Development

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Introduction

- ❖ Environmental toxicants play an important role in the health of many living in urban settings such as Atlanta
- ❖ In these settings, exposure to toxicants, like nicotine, are amplified due to the unequal dispensation of outdoor sources and the greater smoking rates in these areas (Pirkle et al., 1996)
- ❖ Approximately half of the urban populations located in areas that do not meet national ambient air quality standards are African American (Travis et al., 1994)
- ❖ Maternal prenatal smoking is associated with several developmental complications including detriments in motor development in infants and deficits in infant visual and auditory attention (Evlampidou et al., 2015; Windham et al., 1999; Jacobsen et al., 2007)
- ❖ Previous research has relied on self-report which may not accurately capture all nicotine exposures inside and outside the home
- ❖ **This study aimed to (1) examine the association between prenatal nicotine exposure and infant motor development in an urban sample and (2) explore an infant's biological sex as a moderator**

Methods

Participants

72 African American mothers ($M= 25.11$ years, $SD= 5.185$) and their infants ($M= 203.63$ days, $SD= 26.23$, 55.6% Male) from Georgia participated in this study. Mothers were recruited for the CCHM² cohort from either Grady Memorial or Emory Midtown Hospital.

Procedure and Measures

Prenatal Measurements

Visit 1/ Visit 2

- 1) Serum cotinine (ng/ml)
- 2) Maternal self-report smoking behaviors
- 3) Demographic questionnaires

Home Visit

- 1) Serum cotinine (ng/ml)
- 2) Maternal self-report smoking behaviors
- 3) Second-hand smoking behaviors

Postnatal Measurements

6-month Visit

- 1) Bayley Scales of Infant and Toddler Development (3rd Ed.)
- 2) Demographic questionnaires

Findings

		smokeexp	CotinineV1	CotinineV2
6m_Cog_SS_Bayley	Pearson Correlation	-.166	-.102	-.113
	Sig. (2-tailed)	.163	.407	.394
	N	72	68	59
6m_RC_SS_Bayley	Pearson Correlation	-.274*	-.250*	-.326*
	Sig. (2-tailed)	.020	.040	.012
	N	72	68	59
6m_EC_SS_Bayley	Pearson Correlation	-.101	.097	-.100
	Sig. (2-tailed)	.407	.439	.459
	N	70	66	57
6m_FM_SS_Bayley	Pearson Correlation	-.404**	-.131	-.083
	Sig. (2-tailed)	.000	.288	.533
	N	72	68	59
6m_GM_SS_Bayley	Pearson Correlation	-.095	.056	.017
	Sig. (2-tailed)	.428	.649	.896
	N	72	68	59

*. Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

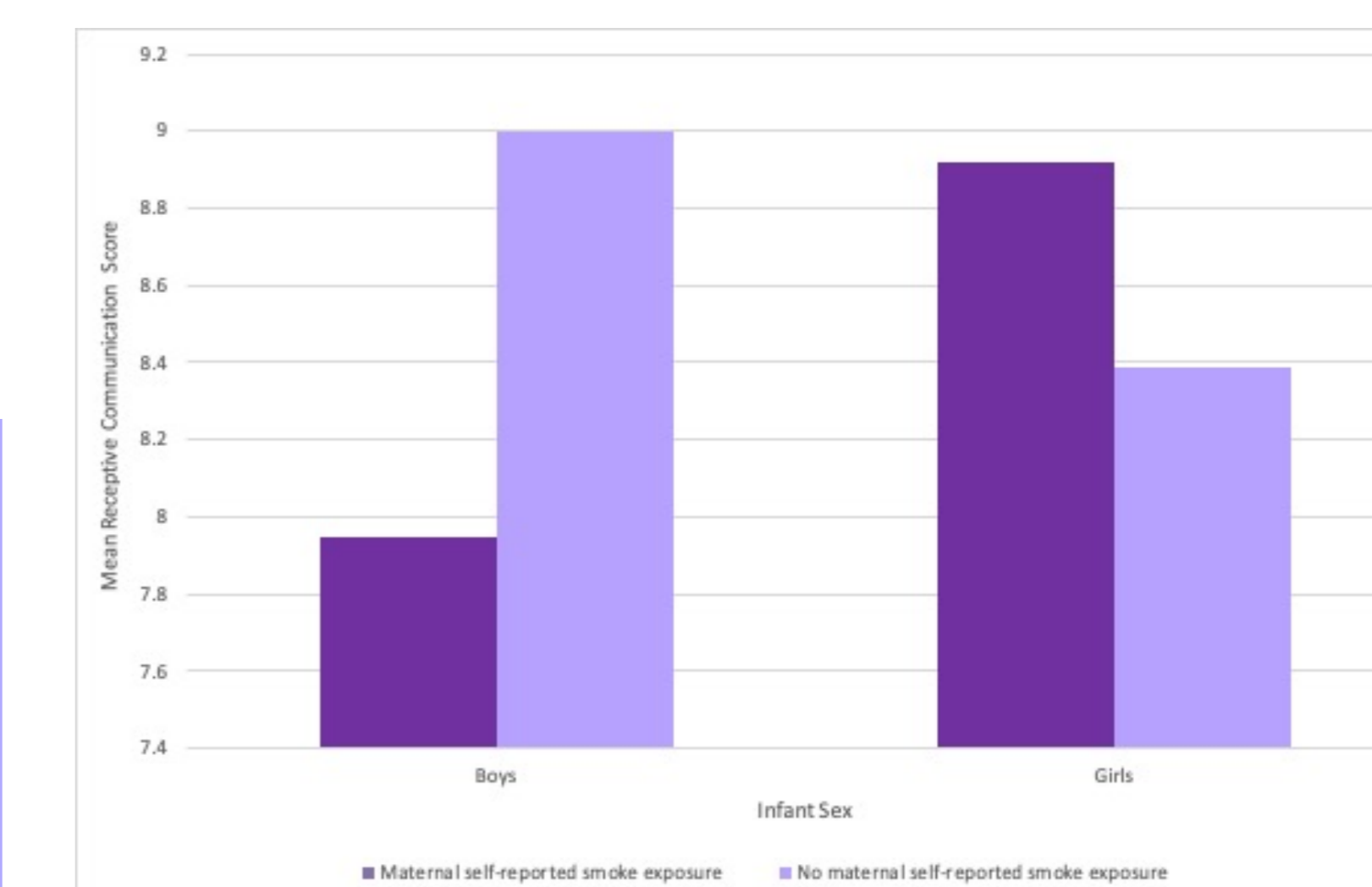
		CotinineV1	CotinineV2	CotinineHV
Self-Report Smoking V1	Pearson Correlation	.494**	.526**	.522**
	Sig. (2-tailed)	.000	.000	.000
	N	68	59	57
Self-Report Smoking V2	Pearson Correlation	.415**	.462**	.532**
	Sig. (2-tailed)	.001	.000	.000
	N	58	57	51
smokeexp	Pearson Correlation	.454**	.509**	.491**
	Sig. (2-tailed)	.000	.000	.000
	N	68	59	57

** Correlation is significant at the 0.01 level (2-tailed).

Table 1. Bivariate Correlations Between Smoke Exposure Measurements and Bayley Scaled Scores (SS)

Cog= Cognitive
RC= Receptive Communication
EC= Expressive Communication
FM= Fine Motor
GM= Gross Motor

Table 2. Bivariate Correlations Between Self-Reported Smoking Behaviors and Cotinine Samples

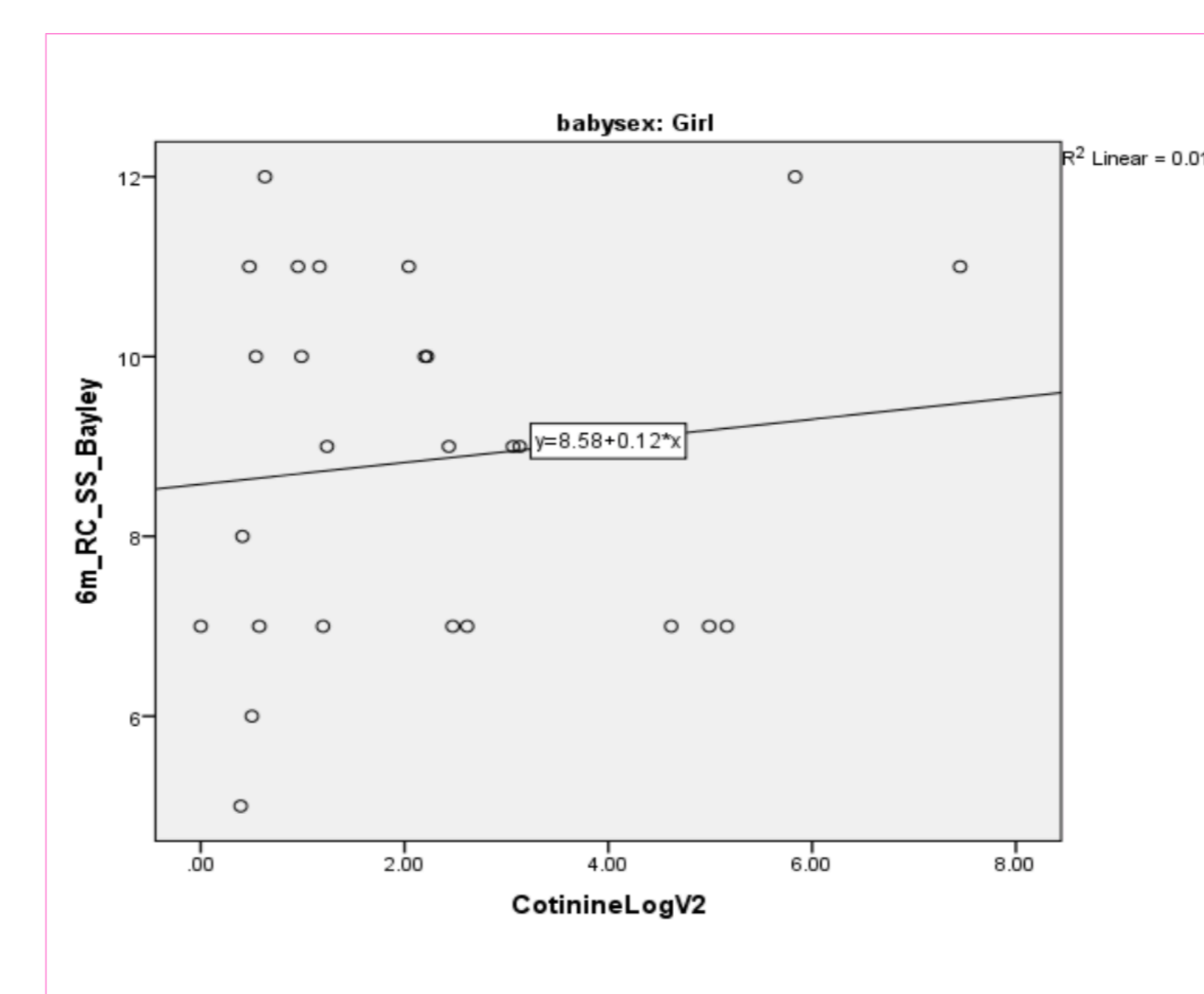
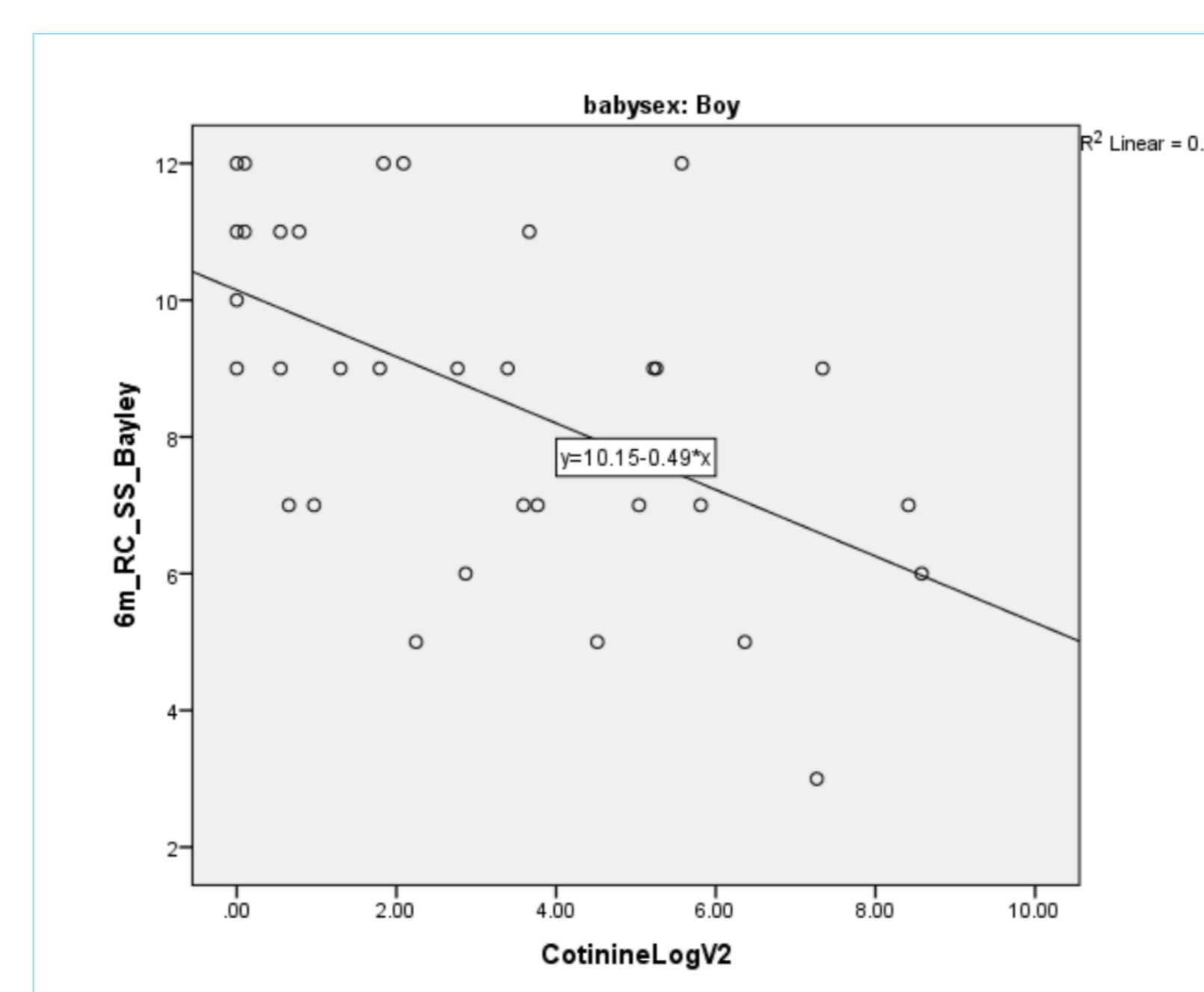
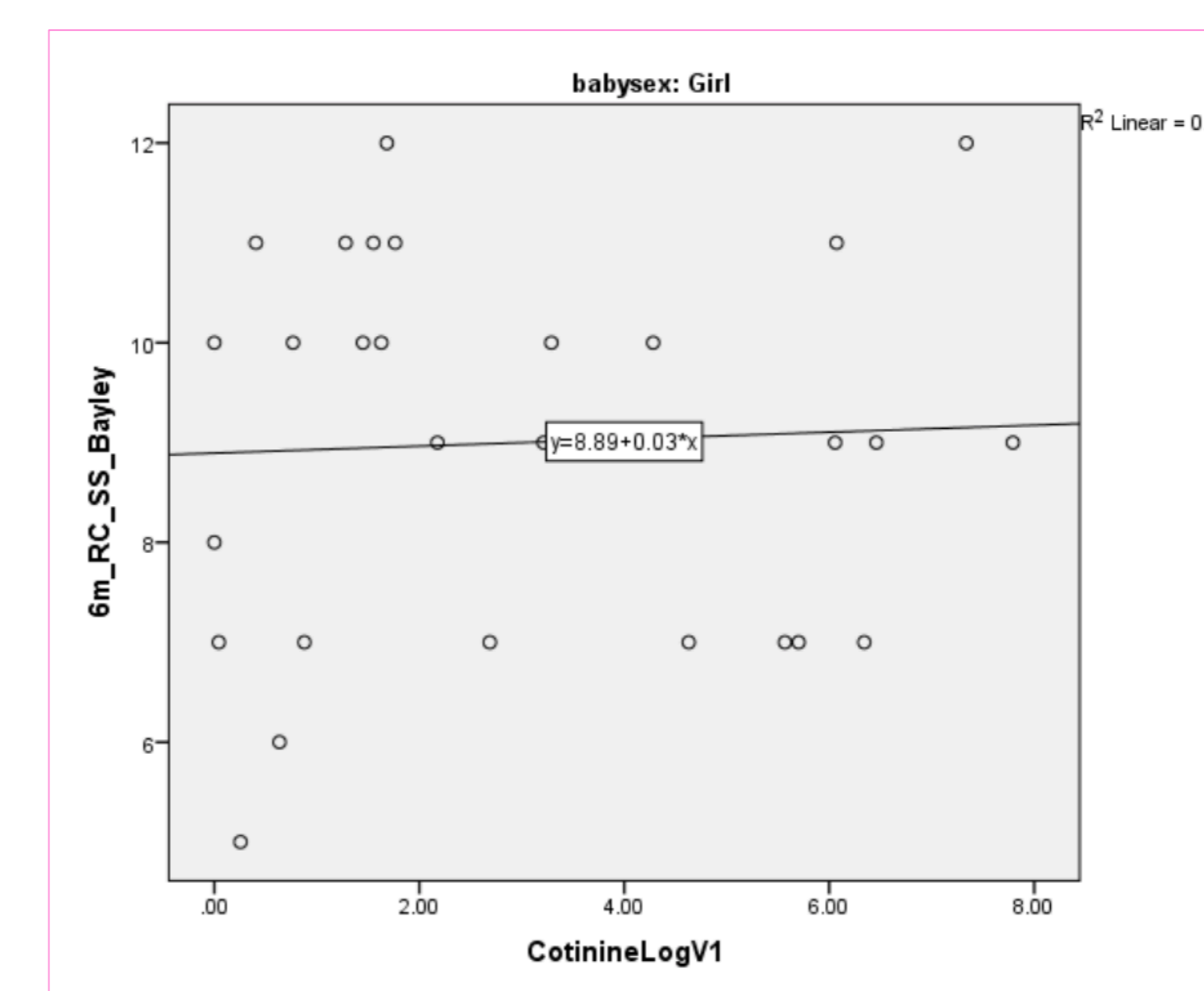
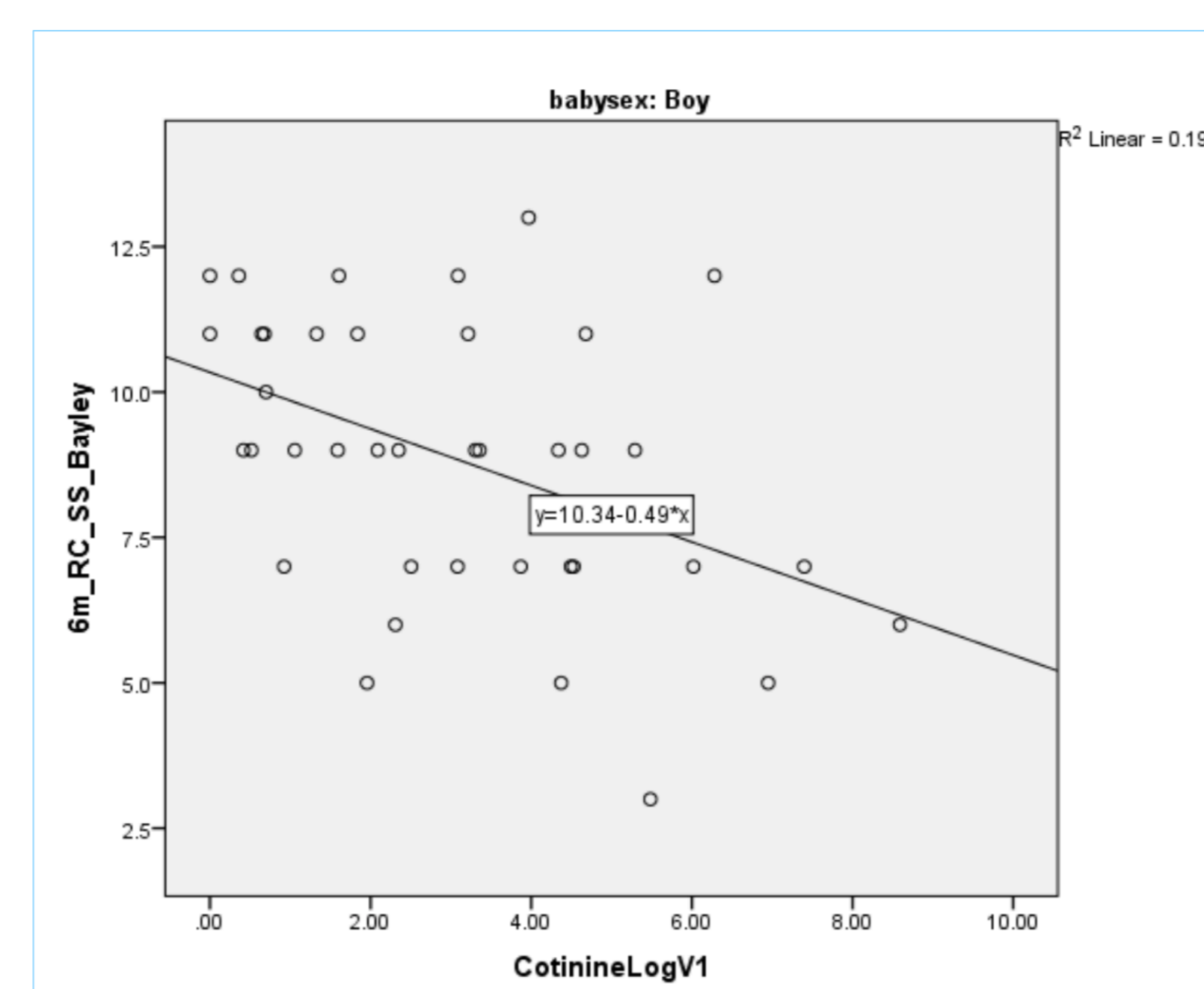


Mean RC Scores for Infants with and without Prenatal Smoke Exposure, Separated by Sex

Conclusion

- ❖ **Maternal prenatal cotinine levels were not significantly associated with infant motor development nor was this interaction moderated by the infant's sex**
- ❖ Maternal self reports of smoke exposures in pregnancy were related to lower fine motor development scores, but sex did not moderate this association
- ❖ **Findings show that boys may be more vulnerable to nicotine in terms of their receptive language development**
- ❖ Maternal prenatal smoking is associated with decreased auditory responsiveness due to nicotine's influence on outer hair cell loss in the ear (Jacobson et al., 1984; Fried 1993)
- ❖ **Self-report measures were significantly correlated with prenatal cotinine levels**
- ❖ The self-report measures did not demonstrate the same outcomes as the cotinine samples despite being correlated
- ❖ Cotinine levels in this sample indicated high levels of second-hand smoke exposure, suggesting continued public health concerns in this area
- ❖ Future research is needed to examine potential effects of timing of prenatal exposure

Regression Analyses of the Relationship Between RC Scores and Cotinine Levels



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