Prenatal Smoke Exposure and Language Outcomes at 15 Months: Social Aspects of Communication vs Expressive and Receptive Language

Beth A. Bailey, PhD,1 Andrea Clements, PhD,2 Jessica Scott, BS,1 Lana McGrady, MS1

Departments of Family Medicine1 and Psychology, East Tennessee State University, Johnson City, TN

Background: Children exposed to cigarette smoking in utero have been found in many studies to be at significantly increased risk for language delays. Studies are inconsistent, however, regarding the specific dimensions of language that are impacted, and whether these delays might actually be a result of prenatal smoke exposure on other developmental outcomes. The goal of the current study was to determine whether the social aspects of children’s communication are differentially related to prenatal smoke exposure compared to their comprehension and production of words.

Methods: Participants were recruited prenatally, and detailed data on smoking and other risk factors were collected prospectively. At approximately 15 months of age, children and their mothers participated in a developmental assessment that included the Receptive-Expressive Emergent Language Test [REEL] and the Communication and Symbolic Behavior Scales [CSBS DP; separate subscales for Speech (expressive language), Symbolic (receptive language), and Social (emotional responsiveness, eye gaze, non-verbal communication) Communication]. Mothers were administered the Peabody Picture Vocabulary Test (PPVT) and completed other questionnaires.

Results: The final sample contained 37 infants, 23 whose mothers smoked while pregnant (SMK), and 14 whose mothers did not (NS). The two groups did not differ significantly on most background or family characteristics. However, compared with the NS children, the SMK group had mothers with significantly higher verbal IQ scores (PPVT), and were significantly more likely to have postnatal smoke exposure. SMK children scored significantly lower on the Social composite of the CSBS DP than did the NS children (percentile scores 47.0 v 70.6, t=2.49, p=.018). However, the SMK group did not differ from the NS group in either Receptive or Expressive Percentile Scores on the REEL (67.7 v 67.9, p=.971; 68.6 v 67.9, p=.940), nor did they differ significantly in percentiles on the Speech or Symbolic scales of the CSBS DP (56.0 v 62.1, p=.584; 47.6 v 57.6, p=.363).

Conclusions: In the current sample, the understanding and use of words was unrelated to prenatal smoke exposure at 15 months of age. However, the social and non-verbal aspects of communication were comparatively delayed among those with prenatal smoke exposure. These findings suggest that only certain aspects of language development may be impacted by prenatal smoke exposure, and suggest avenues for early intervention. Additional study with a larger sample is ongoing to determine if effects found are at least partially due to postnatal exposure or other differences between groups, and, if lack of effects on expressive and receptive language may be due to other group differences and/or a large number of children in the NS group whose mothers were exposed to second hand smoke during pregnancy.