

Evans, G. W., Ricciuti, H. N., Hope, S., Schoon, I., Bradley, R. H., Corwyn, R. F., et al. (2010). Crowding and cognitive development. The mediating role of maternal responsiveness among 36-month-old children. *Environment and Behavior*, 42(1), 135-148.

Crowding and Cognitive Development: The Mediating Role of Maternal
Responsiveness among 36 Month-Old Children

Gary W. Evans¹, Henry Ricciuti¹, Steven Hope², Ingrid Schoon²,
Robert H. Bradley³, Robert F. Corwyn³, Cindy Hazan¹

¹ Cornell University

² Institute of Education, University of London

³ University of Arkansas at Little Rock

This research was partially supported by the W.T. Grant Foundation, the Mac Arthur Foundation Network on Socioeconomic Status and Health, the National Institute of Child Health and Human Development, the UK Economic and Social Research Council (ESRC), L326253061. Data from the UK Millennium Cohort Study were supplied by the ESRC Data Archive. Correspondence concerning this article should be addressed to Gary W. Evans, Departments of Design and Environmental Analysis and of Human Development, Cornell University, Ithaca, NY 14853-4401, gwe1@cornell.edu. (607) 255 4775; FAX (607) 255 0305.

Abstract

Residential crowding in both US and UK samples of 36 month-old children is related concurrently to school readiness after statistical controls for income, child gender, maternal age, and maternal education. In the US sample, these effects also replicate longitudinally. In both samples the association between crowding and school readiness appears to be mediated by maternal responsiveness. Mothers in more crowded homes are less responsive to their children.

Crowding and Cognitive Development: The Mediating Role of Maternal Responsiveness among 36-Month-Old Children

The U.S Census Bureau considers residences with more than one person per room as crowded. In 2000, more than 5% of U.S. households qualified as crowded (US Census, 2002) as did about 7% of households in England and Wales according to the 2001 UK Census (National Statistics, 2003). For children living in crowded homes, negative outcomes include elevated physiological stress (Aiello, Nicosia, & Thompson, 1979; Evans, Lepore, Shejwal, & Palsane, 1998), increased behavioral problems (Evans et al., 1998; Saegert, 1982) and delayed cognitive development (Essen, Fogelman, & Head, 1978; Evans et al., 1998; Goduka, Poole, & Aoktak-Phenice, 1992; Gottfried & Gottfried, 1984; Maxwell, 1996; Murray, 1974; Rutter, Tizard, & Whitmore, 1970; Wachs & Gruen, 1982; Wedge & Petzing, 1970).

Our primary objective in this paper is to examine the psychological processes that may help explain the link between residential crowding and cognitive development in children. Several studies with adults (Baum, Gatchel, Aiello, & Thompson, 1981; Baum & Valins, 1977; Evans & Lepore, 1993; Evans, Rhee, Forbes, Allen, & Lepore, 2000) reveal that residents cope with the plethora of unwanted social interaction accompanying crowding by social withdrawal. In addition, parents in more crowded homes are less responsive to their children compared to parents in less crowded homes (Bradley & Caldwell, 1984; Evans, Maxwell, & Hart, 1999; Wachs, 1989; Wachs & Camli, 1991). Given the well- documented association between parental unresponsiveness and poor

cognitive development in children (Bradley et al., 2001; Grant, Compas, Stuhlmacher, Thurm, McMahon, & Halpert, 2003; Repetti, Taylor, & Seeman, 2002), we tested the hypothesis that parental responsiveness mediates the crowding - cognitive development link.

In Study I we employ a sample with children at 15 and 36 months of age from a national US data set that enabled both cross-sectional and prospective tests of the hypothesis. In Study II we test the generalisability of the findings in 36 month olds from the largest study of child development to date, the UK Millennium Cohort, involving more than ten thousand children. Moreover, we examined crowding, maternal responsiveness, and cognitive development in age cohorts (9, 15 and 36 month olds) that have received scant attention in the crowding literature.

Study I

Method

Participants

Study I utilized a sample of 80, thirty-six month old children born in 1991 from families at one of the ten sites (Little Rock, AR) participating in the NICHD Study of Early Child Care and Youth Development. This research program is a national, longitudinal study of children's cognitive and social development with special focus on the effects of experiences in child care, home, and school (NICHD Early Child Care Research Network, 2001). Unfortunately, only the Little Rock site obtained data on residential density of children's homes. Of the 121 children enrolled at 36 months, 80 had

data available on number of people and number of rooms in the household from birth through 36 months.

The Little Rock sample was 80% White, 19 % Black. Maternal education averaged 13.9 years of schooling, and maternal age 27.6 years. Fifteen percent of the families fell below the poverty line, and the median income-to-needs ratio was 2.5. The income-to-needs ratio is an annually adjusted per capita index comparing household income to federal estimates of minimal requirements for food and shelter. An income-to-needs ratio of 1 is the US Federal Poverty Line. Child gender was equally divided.

Procedure

Data concerning household and family features, as well as maternal characteristics, were collected through periodic home visits, supplemented by intervening telephone interviews. Measures of children's competence were obtained during laboratory visits at 36 months. For further details on methodology, see the National Institute of Child Care and Human Development : Study of Early Child Care and Youth Development (2003).

Measures

Residential density. At 15 and 36 months, residential density was measured as the ratio of the number of people in the household to the number of rooms. People-per-room, rather than other crowding indices, has been most consistently related to health and behavioral outcomes (Baum & Paulus, 1987; Evans, 2001; 2006). Two measures of residential density were obtained, reflecting the child's cumulative experience from birth

to 15 months and birth to 36 months. In each case, the density ratio was based on the mean people per month and mean rooms per month since the child's birth, thus taking into account any changes in residence or in number of people.

Maternal responsiveness. During a home visit at 36 months of age, the early childhood version of the Home Observation for Measurement of the Environment (HOME) Inventory (Bradley & Caldwell, 1984) was administered by raters trained by one of the authors, and subjected to a series of certification tests prior to data collection. Inter-rater reliability on the HOME exceeded 90%. The Maternal Responsiveness subscale of the HOME consisting of seven binary items (yes-no) was used. This subscale, which has excellent reliability and validity (Bradley, 1994) assesses mother's sensitivity and responsiveness to the child's needs and interests.

School Readiness. School readiness was represented by standard scores from the Bracken Scale of Basic Concepts (Bracken, 1984). In order to make these scores comparable to those employed in the UK Millennium Cohort study, they were converted to a scale with a Mean of 100 and a Standard Deviation of 15. The Bracken consists of 61 items assessing letter and color identification, shape recognition, knowledge of numbers/counting, and comparisons.

Results and Discussion

As illustrated in Table 1, residential density both at 15 ($r = -.36$) and 36 months ($r = -.35$) is negatively correlated with 36-month school readiness. These findings replicate prior, cross-sectional findings (see Evans, 2001; 2006 for reviews of this literature).

Moreover, density at both ages is negatively correlated with maternal responsiveness (r 's = -.28, -.29) which has been uncovered in a handful of previous studies (Bradley & Caldwell, 1984; Evans et al., 1999; Wachs, 1989; Wachs & Camli, 1991). Maternal responsiveness is also correlated with school readiness, $r = .31$. Of particular interest to us, however, is whether the pattern of correlations among density, maternal responsiveness, and school readiness (see Table 1) is consistent with our hypothesis that the relationship between residential crowding and deficits in cognitive development is due, in part, to diminished maternal responsiveness in crowded homes.

Insert Table 1 about here

More direct evidence for this mediational hypothesis is contained in Table 2. Rows 1 and 2 show the direct effects of density at 15 and 36 months, respectively on school readiness, controlling for child gender, maternal age and education, and family income. Row 3 indicates that once maternal responsiveness is included in the equation, Density at 36 months no longer predicts school readiness. Row 4 shows parallel longitudinal with Density at 15 months predicting School Readiness at 36 months.¹

Insert Table 2 about here

These data show for the first time that the well-documented linkage between high residential density and poor cognitive development in young children is mediated by diminished maternal responsiveness. Because this is a new finding and based on a small, relatively homogenous urban sample from one American site, we conducted a second analysis with a much larger, nationally representative sample of British children from the UK Millennium Cohort Study.

Study II

Method

Participants

Study II utilised a cohort of thirty-six month old children born in the UK between 2000 and 2002. The Millennium Cohort Study (MCS) is a national, longitudinal study covering child health and development, family structure, education and employment, parental health and psychological well-being, as well as parenting styles and housing conditions (Dex and Joshi, 2005). The first wave of data collection of the MCS took place during 2001 and 2002 when most babies were 9-months old (Dex & Joshi, 2005) and the second wave during 2003 and 2005 when most were 36-months old (Hansen & Joshi, 2007). Due to disproportionate sampling of households in areas of greater child poverty, special weights were applied when analyzing these data (Plewis et al, 2004).

The analytic sample of 10,050 babies was 93% White, with the remainder from a number of minority groups. Thirty nine percent of mothers had completed university education, 53% had some form of academic or vocational qualification and the remaining

8% reported no qualifications. The median household income was £330/week. The sample comprised an equal proportion of male and female children. In the case of multiple births, only one child from the household was included in the present analyses.

Procedure

Data from the 9 and 36 month waves were collected from parents through personal interview and self-completion questionnaire. In addition, cognitive testing and observations were carried out by the interviewer at age 36 months (George, Hansen & Schoon, 2007).

Measures

Residential density. At 9 and 36 months, residential density was measured as the ratio of the number of people in the household to the number of rooms. The mean of these two density measures was used as an index of exposure to crowding.

Maternal responsiveness. During a home visit, interviewers completed an abbreviated version of the HOME Observation for Measurement of the Environment (HOME) Inventory (Bradley & Caldwell, 1984), including four items from the Maternal Responsiveness subscale ($\alpha = .63$). Since the full maternal responsiveness scale of 7 items was used in the US sample, we calculated the correlation between the short and regular version of the scale in the full NICHD set from all 10 US sites. The scales are highly correlated, $r = .91$.

School Readiness. School readiness was represented by age-standardised scores from the Bracken Scale of Basic Concepts (Bracken, 1984), administered by interviewers during home visits.

A number of additional control variables were included in the analyses: maternal education (based on National Vocational Qualification (NVQ) levels (Bradshaw, Mayhew, Dex, Joshi, & Ward, 2005) for the highest academic or vocational qualification attained by the mother; gender of child; maternal age at birth; and household income at 36 months, equivalised for household size and composition (Hansen & Joshi, 2007).

Results and Discussion

As shown in Table 3, the zero order relations among residential density, school readiness, and maternal responsiveness uncovered among 36-month-olds in Little Rock, Arkansas were replicated in the UK Millennium Cohort Study. Children in more crowded homes at 36 months of age are less ready for school ($r = -.29$) and have mothers who are less responsive ($r = -.13$). Maternal responsiveness and school readiness are again correlated as well ($r = .16$).

Insert Table 3 about here

Regression analyses (Table 4) reveal the correlational results maintain with statistical controls for child and maternal personal characteristics. UK toddlers, similar to

their American counterparts, growing up in more crowded homes are less prepared to begin schooling independent of gender, maternal age, education and family income.

Insert Table 4 about here

Comparing Row 1 and Row 2 in Table 4, one can also see evidence replicating Study I for the mediational model of Crowding → Maternal Responsiveness → Children's Cognitive Development. The 6% reduction in the *b* weight for residential density after partialling out the covariance with maternal responsiveness, is significant, (Sobel test, $z = -4.86$, $p < .001$). Some of the adverse cognitive development sequelae of residential crowding are conveyed by maternal responsiveness.

General Discussion

Residential crowding during early childhood predicts school readiness at 36 months both concurrently (Studies I and II) and prospectively (Study I). The links between crowding and cognitive development are robust herein and replicate earlier cross-sectional studies showing negative correlations between crowding and cognitive development in early and middle childhood (Essen et al., 1978; Evans et al., 1998; Goduka et al., 1992; Gottfried & Gottfried, 1984; Maxwell, 2003; Murray, 1974; Rutter et al., 1970; Wachs & Gruen, 1982; Wedge & Petzing, 1970). Only Gottfried and Gottfried (1984) and Wachs and Gruen (1982) examined children in this age range (15-36 months), but neither study incorporated statistical controls for sociodemographic

variables as we have in the present study. Our prospective data are especially interesting because they suggest that processes connecting crowding to lower levels of cognitive attainment are initiated in infancy. The developmental timing of these processes comports with the broader literature on SES which show delays in cognitive functioning beginning by the second year of life (Bradley & Corwyn, 2002).

Our data also reveal, for the first time, that the well-documented linkages between higher residential crowding and poorer cognitive development are largely mediated by diminished maternal responsiveness. These findings extend previous, cross-sectional work showing negative correlations between crowding and maternal responsiveness (Bradley & Caldwell, 1984; Evans et al., 1999; Wachs, 1989; Wachs & Camli, 1991). Herein we show that greater crowding, at ages 9, 15 and 36 months of age, is related to less maternal responsiveness at 36 months of age. Mediation analyses suggest that this relation explains some of the association between crowding and cognitive development.

Although the basic findings replicate across the two different, cross-sectional samples as well as longitudinally in the US sample, there are some differences in the findings. The magnitude of the mediation is clearly stronger in Study I with a 14% reduction in the b weight for density compared to a 6% reduction in Study II. Note also that the zero order correlations between density and maternal responsiveness as well as between maternal responsiveness and school readiness in the US sample are larger than in the UK sample (see Tables 1 and 3). Since the mean levels and variance in density were similar across the two samples, it is unlikely that different levels of exposure to

crowding can account for the stronger relations between density and maternal responsiveness in the Little Rock sample vis a vis the UK sample. The Little Rock Sample, however, is more ethnically diverse, less educated, and has a larger proportion of low-income families compared to the UK sample. The Little Rock data also reveal lower levels of school readiness and maternal responsiveness compared to the UK data.

One possible reason for the stronger, mediational effects of maternal responsiveness in the US compared to the UK sample is tolerance to crowding. Perhaps UK residents are more accustomed to smaller homes than Americans are. Note that the zero order correlations between residential density and the Bracken were somewhat smaller ($r = -.29$) in the UK than in the US ($r = -.35$). In interpreting the findings one should also take into consideration that although measures were similar in both studies, they were not identical. Further, there might be other mediators linking crowding to children's cognitive development besides maternal responsiveness. Parents in more crowded homes speak less often to their children (Evans et al., 1999), and high density homes are noisier and more chaotic (Evans, 2006). One valuable extension of the present study would be to investigate residential crowding in conjunction with crowding in early childcare settings. Experimentally induced increases in classroom density produced more off task time in kindergartners (Krantz, 1974), and children in more crowded daycare centers, independent of social class, had diminished cognitive development (Ruopp et al., 1979). Moreover, the adverse relations between residential density and preschooler's cognitive development were amplified by crowded daycare

settings (Maxwell, 1996). It would be particularly interesting to examine whether caregiver responsiveness in early childcare settings plays a mediating role between school or daycare crowding and delayed cognitive development similar to that found herein. The UK Millennium Cohort Study will also afford an unprecedented opportunity to examine how crowding over the life course influences cognitive as well as socioemotional development since these children are continuing to be monitored as they grow up.

Some of the adverse, socioemotional and cognitive developmental sequelae of suboptimal living and school conditions such as crowding, noise, or poor construction quality (Evans, 2001; 2006) may occur because of their impact on adult-child interaction. The quality of physical settings inhabited by children affects their development and some of this is likely due to adjustments their parents or teachers make to cope with those same suboptimal conditions.

References

- Aiello, J.R., Nicosia, G., & Thompson, D. (1979). Physiological, social, and behavioral consequences of crowding on children and adolescents. *Child Development, 50*, 195-202.
- Baum, A., Gatchel, R., Aiello, J.R., & Thompson, D. (1981). Cognitive mediation of environmental stress. In J. Harvey (Ed.), *Cognition, social behavior, and the environment* (pp. 513-533). Hillsdale, NJ: Erlbaum.
- Baum, A., & Paulus, P.B. (1987). Crowding. In I. Altman & D. Stokols (Eds.), *Handbook of environmental psychology* (pp. 533-570). NY: Wiley.
- Baum, A., & Valins, S. (1977). *Architecture and social behavior*. Hillsdale, NJ: Erlbaum.
- Bracken, B.A. (1984). *Bracken basic concept scales*. San Antonio, TX: Psychological Corporation.
- Bradley, R.H. (1994). The HOME Inventory: Review and reflections. In H. Reese (Ed.), *Advances in child development and behavior* (pp. 241-288). San Diego: Academic Press.
- Bradley, R.H., & Caldwell, B.M. (1984). The HOME inventory and family demographics. *Developmental Psychology, 20*, 315-320.
- Bradley, R.H., & Corwyn, R.F. (2002). SES and child development. *Annual Review of Psychology, 53*, 371-399.

Bradley, R.H., Corwyn, R.F., Burchinal, M., McAdoo, H.P., & Garcia-Coll, C. (2001). The home environment of children in the United States Part II: Relations with behavioral development through age thirteen. *Child Development, 72*, 1868-1886.

Bradshaw, J., Mayhew, E., Dex, S., Joshi, H., & Ward, K. (2005). Socioeconomic origins of parents and child poverty. In S. Dex & H. Joshi (Eds.), *Children of the 21st Century: From birth to nine months*. Bristol,UK: Policy Press.

Dex, S., & Joshi, H. (2005). *Children of the 21st Century: From birth to nine months*. Bristol,UK: Policy Press.

Essen, J., Fogelman, K., & Head, J. (1978). Childhood housing experiences. *Childcare, Health and Development, 4*, 41-58.

Evans, G.W. (2001). Environmental stress and health. In A. Baum, T. Revenson, & J.E. Singer (Eds.), *Handbook of health psychology* (pp. 365-385). Mahwah,NJ: Erlbaum.

Evans, G.W. (2006). Child development and the physical environment. *Annual Review of Psychology, 57*, 423-451.

Evans, G.W., & Lepore, S.J. (1993). Household crowding and social support: A quasi-experimental analysis. *Journal of Personality and Social Psychology, 65*, 308-316.

Evans, G.W., Lepore, S.J., Shejwal, B.R., & Palsane, M.N. (1998). Chronic residential crowding and children's well being: An ecological perspective. *Child Development, 69*, 1514-1523.

Evans, G.W., Maxwell, L.E., & Hart, B. (1999). Parental language and verbal responsiveness to children in crowded homes. *Developmental Psychology, 35*, 1020-1023.

Evans, G.W., Rhee, E., Forbes, C., Allen, K.M., & Lepore, S.J. (2000). The meaning and efficacy of social withdrawal as a strategy for coping with chronic crowding. *Journal of Environmental Psychology, 20*, 335-342.

George, A., Hansen, K., & Schoon, I. (2007). Child development. In K. Hansen & H. Joshi (Eds.), *Millennium Cohort Study. Second Survey. A User's Guide to Initial Findings*. London: Institute of Education, Centre for Longitudinal Studies.

Goduka, I., Poole, D., & Aotaki-Phenice, L. (1992). A comparative study of black South African children from three different contexts. *Child Development, 63*, 509-525.

Gottfried, A.W., & Gottfried, A.E. (1984). Home environment and cognitive development in young children of middle-socioeconomic status families. In A.W. Gottfried (Ed.), *Home environment and early cognitive development* (pp. 57-115). NY: Academic.

Grant, K.E., Compas, B.E., Stuhlmacher, A., Thurm, A., Mc Mahon, S., & Halpert, J. (2003). Stressors and child and adolescent psychopathology: Moving from markers to mechanisms of risk. *Psychological Bulletin, 129*, 447-466.

Hansen, K., & Joshi, H. (2007). *Millennium Cohort Study. Second Survey. A User's Guide to Initial Findings*. London: Institute of Education, Centre for Longitudinal Studies.

Krantz, P.J. (1974). Ecological arrangements in the classroom. *Unpublished Doctoral Dissertation*. University of Kansas. Lawrence, KN.

Maxwell, L.E. (1996). Multiple effects of home and day care crowding. *Environment and Behavior*, 28, 494-511.

Murray, R. (1974). The influence of crowding on children's behavior. In D. Canter & T. Lee (Eds.), *Psychology and the built environment* (pp. 112-117). Chichester, UK: Wiley.

NICHD Early Child Care Research Network (2001). Non-maternal care and family factors in early development: An overview of the NICHD Study of Early Child Care. *Applied Developmental Psychology*, 22, 457-492.

National Institutes of Child Health and Human Development: Study of Early Child Care and Youth Development. Accessed October, 2003.
<http://secc.rti.org/home.cfm>

National Statistics (2003). Census 2001- People and their homes in England and Wales. London: National Statistics. www.statistics.gov.uk/pdfdir/homes0203.pdf

Plewis, I. , Calderwood, L., Hawkes, D., Hughes, G., & Joshi, H. (2004). The Millennium Cohort Study: Technical Report on Sampling (3rd ed.). London: Institute of Education.

Repetti, R.L., Taylor, S.E., & Seeman, T. (2002). Risky families, family social environments and the mental and physical health of offspring. *Psychological Bulletin*, 128, 330-366.

Reynell, J. (1991). *Reynell developmental language scales*. Los Angeles: Western Psychological Service.

Ruopp, R., Travers, J., Glantz, F., & Coelen, C. (1979). *Children at the center*. Cambridge, MA: Abt & Associates.

Rutter, M., Tizard, J., & Whitmore, K. (1970). *Education, health and behaviour*. London: Longman.

Saegert, S. (1982). Environment and children's mental health: Residential density and low income children. In A. Baum & J.E. Singer (Eds.), *Handbook of psychology and health (Vol. 2)* (pp. 247-271). Hillsdale, NJ: Erlbaum.

US Census (2002).

http://www.stats.govt.nz.domino/external/web/prod_serv.nsf/Response/Indicator+2c:+American+Crowding+Index:+People+Per+Room

Wachs, T.D. (1989). The nature of the physical microenvironment: An expanded classification system. *Merrill-Palmer Quarterly*, 35, 399-419.

Wachs, T.D., & Camli, O. (1991). Do ecological or individual characteristics mediate the influence of the physical environment upon maternal behavior? *Developmental Psychology*, 11, 249-264.

Wachs, T.D., & Gruen, G. (1982). *Early experience and human development*. NY: Plenum.

Wedge, P., & Petzing, J. (1970). Housing for children. *Housing and Review*, 19, 165-166.

Footnote

1 Density at both time points is significantly related to the mediator, maternal responsiveness, net of the sociodemographic controls (Density₃₆ $b = -1.15$ ($SE = .51$) Density₁₅ $b = -1.33$ ($SE = .55$)). As a partial check on spuriousness, the density and maternal responsiveness terms were entered in reverse order in both of the regression equations for Density at 15 and 36 months. If a third, unspecified variable accounted for the effects of density and maternal responsiveness, reversing the terms should not have affected the results of our regression analyses. However reversing the terms of the equation did significantly alter the results. Specifically in both equations, maternal responsiveness had a significant effect on school readiness, after controlling for income-to-needs ratio, gender, maternal age, maternal education and partialling out the effects of density. These results for both Density₁₅ and Density₃₆ do not support the alternative hypothesis of spuriousness.

* $p < .05$

** $P < .01$

¹ Note: density at 15 months is accumulated exposure to household density (people/room) measured from birth to 15 months of age based on mean people per month and mean rooms per month since the child's birth, thus taking into account any changes in residence or in number of people. Density at 36 months is the comparable index from birth to age 36 months.

Table 2

Little Rock Regression of 36 Month School Readiness onto Density, including Statistical Controls for Income-to-Needs Ratio, Child Gender, and Maternal Age and Education

Predictor	Total R^2	F (total R^2)	b	SE of b
Density ₃₆	.21	3.60**	-15.02*	6.99
Density ₁₅	.21	3.56**	-14.33*	6.77
Density ₃₆ with additional control for maternal responsiveness	.26	3.76**	-12.90	6.93
Density ₁₅ with additional control for maternal responsiveness	.25	3.65**	-11.66	6.82

* $p < .05$

** $P < .01$

Table 3

UK Descriptive Statistics and Zero-order Correlations

Variables	Mean (SD)	2	3	4	5	6	7
1. Density ₉₋₃₆ ¹	.74 (.25)	-.29**	-.13*	.02	-.10*	-.35**	-.41**
2. School readiness	105.53 (15.83)		.16**	.12*	.19**	.35**	.33**
3. Maternal responsiveness	3.82 (.57)			.01	.12*	.13*	.11*
4. Gender (1=Male, 2= Female)	Male 51%				.00	.00	.01
5. Maternal age	29.24 (5.71)					.29**	.34**
6. Maternal ed. (1=no qualification - 5 university qualification or equivalent)	2.52 (1.56)						.46**
7 Household Income (British Sterling)	385.26 (268.07)						

* $p < .05$

** $P < .01$

¹ Density in the UK sample was the mean of people per room at 9 and 36 months of age.

Table 4

UK Regression of 36 Month School Readiness onto Density, including Statistical Controls for Household Income, Child Gender, and Maternal Age and Education

Predictor	Total R^2	F (total R^2)	b	SE of b
Density ₉₋₃₆	.17	316.20**	-9.34**	.79
Density ₉₋₃₆ with additional control for maternal responsiveness	.18	284.46**	-8.77**	.78

* $p < .05$

** $P < .01$