Attachment Security and Obesity in US Preschool-Aged Children

Sarah E. Anderson, PhD; Robert C. Whitaker, MD, MPH

Objective: To estimate the association between attachment security in children aged 24 months and their risk for obesity at 4½ years of age. Insecure attachment is associated with unhealthy physiologic and behavioral responses to stress, which could lead to development of obesity.

Design: Cohort study.


Participants: Children and mothers participating in the 2003 and 2005-2006 waves of the Early Childhood Longitudinal Study, Birth Cohort, conducted by the National Center for Education Statistics. Our analytic sample included 6650 children (76.0% of children assessed in both waves).

Main Exposure: Attachment security at 24 months was assessed by trained interviewers during observation in the child’s home. Insecure attachment was defined as lowest quartile of attachment security, based on the security score from the Toddler Attachment Sort–45 Item.

Outcome Measure: Obesity at 4½ years of age (sex-specific body mass index ≥95th percentile for age).

Results: The prevalence of obesity was 23.1% in children with insecure attachment and 16.6% in those with secure attachment. For children with insecure attachment, the odds of obesity were 1.30 (95% confidence interval, 1.05-1.62) times higher than for children with secure attachment after controlling for the quality of mother-child interaction during play, parenting practices related to obesity, maternal body mass index, and sociodemographic characteristics.

Conclusions: Insecure attachment in early childhood may be a risk factor for obesity. Interventions to increase children’s attachment security should examine the effects on children’s weight.


The importance of preventing childhood obesity is underscored by the persistence of obesity between childhood and adulthood, the health consequences of obesity throughout life, and the difficulties associated with obesity treatment. The obesity epidemic in the United States has affected even preschool-aged children, leading medical and public health experts to suggest that obesity prevention efforts should begin early in life. The approaches typically used to prevent childhood obesity aim to directly alter the balance between energy intake and expenditure by changing dietary, physical activity, and sedentary behaviors. However, because interventions using these approaches have not proved to be very effective, alternative strategies need to be considered.

A novel approach to preventing obesity is to help children develop healthy emotion regulation, controlling their physiologic and behavioral responses to emotions that arise from psychological stress. There is increasing evidence linking the stress response to obesity and the metabolic syndrome. High stress levels or an exaggerated response to stress can disrupt the functioning and development of the interrelated physiologic systems that affect energy balance, body weight, and fat distribution. These include the systems regulating sleep, mood, motor activity, and food intake. For example, it has been suggested that difficulties in regulating negative emotions, such as fear, sadness, anxiety, and anger, might cause eating in the absence of hunger.

A child’s stress responses and emotion regulation begin forming at the earliest stages of brain development. A secure attachment pattern is the best behavioral marker of whether a child has developed healthy emotion regulation and stress responses. Relying on the parent as a “safe haven,” securely attached children explore their environments freely, adapt eas-
ily to new people and situations, and are able to be comforted under stressful circumstances. \(^\text{30}\) Compared with children who have an insecure attachment pattern, those with a secure pattern perform better on tasks requiring emotion regulation \(^\text{31,32}\) and have healthier physiologic responses to stress. \(^\text{27,33}\) Interventions with parents have been shown \(^\text{34-36}\) to increase children's attachment security.

Despite what is known about the role of the physiologic and behavioral responses to stress in the development of obesity and how secure attachment reflects healthy emotion regulation and stress responses in children, we know of no studies that have examined children's early attachment security and obesity. Using data from a recent US cohort study, \(^\text{37}\) we examined the association between attachment security at 24 months of age and obesity at 4.5 years of age.

**STUDY METHODS**

We analyzed data from the Early Childhood Longitudinal Study, Birth Cohort, \(^\text{37}\) which was conducted by the National Center for Education Statistics and approved by its ethics review board. Parents provided written informed consent. The Ohio State University has a restricted-use data agreement with the National Center for Education Statistics and is required by this agreement to report unweighted sample sizes by rounding to the nearest 50.

The design of the study has been described. \(^\text{37}\) Briefly, a clustered list-frame design was used to select a probability sample of 14,000 US births in 2001. Children were excluded if they were born to mothers younger than 15 years or died or were adopted before 9 months of age. The final study cohort of 10,700 was formed when the children were approximately 9 months; 9,850 were assessed at 24 months, and 8,750 of these children were assessed at approximately 4.5 years. Data collection took place in the children's homes and consisted of an interview with the child's mother (or in a few cases, the father or other guardian) and direct assessment of the mother and child.

**MAIN EXPOSURE**

Our primary exposure variable was the child's attachment security at 24 months of age, assessed with the Toddler Attachment Sort–45 Item, a modified version of the Attachment Q-sort. \(^\text{38-40}\) In-home data collection allowed the data collector to observe the mother and child for approximately 2 hours. After the home visit, the data collector sorted 45 "cards" based on how well the behavior described on each card applied to the child. The descriptions on the cards included phrases such as "seeks and enjoys being hugged by mother"; "when crying or upset, is easily comforted by contact with the mother"; and "if asked, lets friendly adult strangers (ie, the data collector) hold or share toys." Data collectors received more than 5 hours of training and were required to demonstrate their ability to administer the attachment sort in a reliable and valid manner. \(^\text{40}\) From the attachment sort, a continuous measure of attachment security (security score) was derived, which could range from −1 to 1, with higher values indicating a more secure child. \(^\text{38-40}\) Such a child would be described as affectionate, cooperative, and sociable, as well as not clingy, demanding, or aloof. In our sample, attachment scores ranged from −0.86 to 1 and were skewed toward positive values, with a mean of 0.49; this distribution is consistent with studies that have used the Attachment Q-sort. \(^\text{39}\)

For our analyses, we classified children in the lowest quartile of the security score as insecurely attached and those in the upper 3 quartiles as securely attached. We chose the lowest quartile (rather than some other cutoff point) with the rationale that it would be preferable to misclassify children with insecure attachment as having secure attachment rather than vice versa; doing so would be likely to make our estimate of any association between insecure attachment and later obesity a conservative one. Based on the attachment sort, it is also possible to derive a 4-level classification of attachment type (secure, ambivalent, avoidant, or disorganized); we report a secondary analysis using this alternative classification.

**OUTCOME MEASURE**

We defined children's obesity status at 4.5 years of age relative to the 2000 US growth reference. \(^\text{41}\) Children's height and weight were measured using a standardized protocol. \(^\text{42}\) We determined body mass index (BMI) (calculated as weight in kilograms divided by height in meters squared) and categorized children as obese if they had a sex-specific BMI at or above the 95th percentile for age. \(^\text{5,9,43}\)

**COVARIATES**

Potential confounding variables were grouped into 5 domains: (1) mother's interaction with child, (2) child's interaction with mother, (3) parenting practices associated with obesity, (4) maternal health, and (5) sociodemographic characteristics. We investigated the extent to which these variables might be an alternative explanation for an association between attachment security and obesity. The first 2 domains assess the quality of the social-emotional interaction between mother and child and were coded from videotapes of a semi-structured 10-minute mother-child play period. \(^\text{44}\)

**Mother's Interaction With Child**

Maternal responsiveness was coded from videotaped mother-child play at 24 months. The variable was based on a composite of 3 areas: sensitivity (reacting warmly and consistently to the child's signals and gestures), intrusiveness, and positive regard toward the child. \(^\text{45}\) Each area was coded separately using Likert scales, where 1 indicated not at all characteristic and 7 indicated very characteristic. The 3 scores were summed, with intrusiveness being reverse coded. We created 4 categories of maternal responsiveness that approximated quartiles: low (≤14), medium (15-16), high (17), and very high (≥18).

**Child's Interaction With Mother**

This domain is represented by 2 variables: child engagement and child negativity. As with maternal responsiveness, the variables were based on coding of videotaped mother-child play at 24 months using the same 7-point Likert scale. For child engagement, a high score indicated a child who frequently attempted to interact with the mother in play and a low score indicated a child who ignored or rejected the mother or who occupied himself/herself without including the mother. \(^\text{46}\) We created 4 categories of child engagement that approximated quartiles: low (≤3), medium (4), high (5), and very high (≥6). For child negativity, a high score indicated a child who frequently or intensely hit or pushed the mother, threw toys, screamed, or excessively whined or cried. A low score indicated that these behaviors were never displayed or rarely displayed. Because scores were highly skewed, we created 3 categories of child negativity: very low (1), low (2), and medium/high (≥3).
Parenting Practices Associated With Obesity

This domain is represented by 5 variables: duration of breastfeeding, introduction of solid foods, regularly eating dinner as a family, adequate nighttime sleep, and limited weekday television/video/DVD viewing. The first 2 variables were assessed at 9 months of age. Mothers were asked whether they had ever breastfed the child and, if so, the age of the child at weaning.46 We categorized breastfeeding duration as never, less than 2 months, 2 to 5 months, and 6 months or longer. For the second variable, mothers were asked how old the child was (in months) when solid food was first introduced.46 We created 3 age categories: 0 to 3 months, 4 to 3 months, and 6 months or older. The last 3 variables, household routines that are associated with lower obesity prevalence,47 were assessed when children were 4½ years: regularly eating dinner as a family (≥6 nights per week), adequate nighttime sleep (≥10½ hours), and limited weekday television/video/DVD viewing (≤2 hours).

Maternal Health

Four variables were included in this domain: maternal weight, smoking status, depressive symptoms, and self-reported health. All were assessed when the child was 9 months. Mothers were weighed with the same protocol used for the children but self-reported their height. If maternal weight was missing at 9 months but available at 24 months or 4½ years, we substituted the first available weight value to calculate maternal BMI. Maternal cigarette smoking status was categorized as yes/no, and maternal depressive symptom scores were categorized based on a score from the modified version of the Center for Epidemiologic Studies Depression Scale as none (0-4), mild (5-9), moderate (10-14), and severe (≥15).48 Maternal self-reported health was based on response to the question, “Would you say your health in general is excellent, very good, good, fair, or poor?”46

Sociodemographic Characteristics

Eleven variables were included in this domain: child age, sex, race/ethnicity, birth weight, twin status, number of siblings, residence with both biologic parents, primary childcare arrangement, household income to poverty ratio (relative to 2002 US poverty levels),49 maternal age, and maternal educational level. All these variables were assessed at 9 months except childcare arrangement and child age, which were assessed at 24 months, and birth weight, which was recorded from the child’s birth certificate.

STATISTICAL ANALYSIS

Of the 8750 children assessed at 24 months and 4½ years, we restricted our analytic sample to 6650 children. We excluded 550 children who were missing data on either attachment at 24 months or obesity at 4½ years. Because of the importance of the quality of parent-child interaction as a potential confounding variable,50 we excluded an additional 1550 children who did not have videotapes of mother-child interaction at 24 months. Thus, the analytic sample included 76.0% of children assessed at 24 months and 4½ years. We applied sampling weights, which included adjustments for planned oversampling and for nonresponse at each wave of data collection.52 To construct confidence intervals (CIs) that accounted for the sampling design, we used a jackknife procedure with replicate weights as implemented in SAS version 9.2 statistical software.54

We determined the association of covariates with the prevalence of insecure attachment at 24 months and with obesity at 4½ years. We used logistic regression models to estimate the odds for obesity at 4½ years associated with insecure attachment at 24 months and to control for potential confounding. We present odds ratios (ORs) and 95% CIs that are unadjusted, as well as adjusted for increasing numbers of covariates. We entered covariates in domains in the order described in the “Covariates” subsection of this section. The final regression model included 6250 children; 400 children were excluded from the final model because information was missing on at least 1 covariate. Maternal BMI, maternal age, child age, and birth weight were included in our regression models as continuous variables; other covariates were included as categorical variables. We used interaction terms to examine whether the association between attachment security and obesity differed according to sex, racial/ethnic group, maternal educational level, income to poverty ratio, or maternal BMI.

Children were, on average, 24.3 months (median, 24.0; interquartile range, 1.0) at the 24-month assessment and 52.4 months (median, 52.3; interquartile range, 6.2) at the 4½-year assessment. Insecure attachment was associated with low maternal responsiveness, low child engagement, high child negativity, maternal smoking, poor maternal health, male sex, nonwhite race/ethnicity, low birth weight, being a twin, low maternal educational level, low income to poverty ratio, not residing with both biologic parents, and young maternal age (Table 1). The prevalence of obesity at 4½ years was 18.4% (95% CI, 17.1%-19.8%). Obesity was associated with many of the same covariates as insecure attachment (Table 1).

For children with insecure attachment (4th or lowest quartile of security score), the prevalence of obesity at 4½ years was 23.1% (95% CI, 19.9%-26.3%) compared with 16.6% (15.3%-17.8%) for children with secure attachment (top 3 quartiles of security score). The prevalence of obesity was 19.0% (95% CI, 17.0%-21.0%), 14.6% (12.4%-16.8%), and 17.0% (14.7%-19.4%) in the 3rd, 2nd, and 1st quartiles, respectively. Unadjusted for covariates, the odds of obesity at 4½ years among insecurely attached children were 1.48 (95% CI, 1.23-1.79) times those of securely attached children (Table 2). With adjustment for mother’s interaction with the child and child’s interaction with the mother, the OR was 1.40 (95% CI, 1.15-1.71). With further adjustment for parenting practices, maternal health, and sociodemographic characteristics, the OR was 1.30 (95% CI, 1.05-1.62). We observed no evidence that the association between attachment security at 24 months and obesity at 4½ years differed by levels of sex, racial/ethnic group, maternal educational level, income to poverty ratio, or maternal BMI (P > .10 for all interaction tests).

Our findings were similar when we used the 4-level classification of attachment and compared the risk of obesity in insecurely attached children (combining the ambivalent, avoidant, and disorganized groups) with the risk in securely attached children. Using this method, 36.7% of children were classified as insecurely attached. The odds of obesity at 4½ years were higher among insecurely attached children than securely attached children in unadjusted (OR, 1.40; 95% CI, 1.18-1.66) and fully adjusted (1.20; 0.98-1.45) logistic regression models.
Our prospective analysis of a large national cohort of US children born in 2001 indicated that 24-month-old children with an insecure attachment pattern were at increased risk for obesity at 41⁄2 years. This association persisted after accounting for factors that could provide alternative explanations, including mother-child interaction during play, parenting practices related to obesity, maternal BMI, and sociodemographic characteristics. To our knowledge, this is the first study to investigate the role of children’s attachment security in the development of obesity.

These findings have biopsychosocial plausibility.55 There is evidence that obesity and the metabolic syndrome are biologically linked through shared genetic and environmental risk factors.16,17,56 Moreover, the psychosocial influences on child development have been highlighted as a critical area for intervention to prevent obesity.56,57 Our results are consistent with these observations and emphasize the need for future research to further explore the mechanisms underlying the relationship between attachment security and obesity.
Table 1. Prevalence of Insecure Attachment at 24 Months of Age and Obesity at 4½ Years of Age According to Sample Characteristics (continued)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>No. (Column %)</th>
<th>Insecure Attachment at 24 mo</th>
<th>P Value&lt;sup&gt;c&lt;/sup&gt;</th>
<th>Obesity at 4½ y</th>
<th>P Value&lt;sup&gt;c&lt;/sup&gt;</th>
</tr>
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<td><strong>Sociodemographics</strong></td>
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<tr>
<td>Sex</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Female</td>
<td>3300 (48.7)</td>
<td>20.6 (18.2-23.0)</td>
<td>&lt;.001</td>
<td>16.4 (14.6-18.2)</td>
<td>.002</td>
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<td>Male</td>
<td>3350 (51.3)</td>
<td>29.4 (27.0-31.8)</td>
<td></td>
<td>20.3 (18.5-22.1)</td>
<td></td>
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<td>Racial-ethnic group</td>
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<td>White, non-Hispanic</td>
<td>3000 (55.9)</td>
<td>22.4 (19.7-25.1)</td>
<td>&lt;.001</td>
<td>15.9 (14.3-17.5)</td>
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<tr>
<td>Black, non-Hispanic</td>
<td>1150 (15.4)</td>
<td>28.5 (25.2-31.8)</td>
<td>&lt;.001</td>
<td>21.4 (18.1-24.7)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Hispanic, any race</td>
<td>1150 (22.6)</td>
<td>29.1 (25.8-32.4)</td>
<td>&lt;.001</td>
<td>21.8 (19.1-24.5)</td>
<td>&lt;.001</td>
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<td>Other race, non-Hispanic</td>
<td>1350 (6.1)</td>
<td>26.4 (22.3-30.5)</td>
<td>&lt;.001</td>
<td>21.8 (17.5-26.1)</td>
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<td>Birth weight</td>
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<tr>
<td>Very low, &lt;1500 g</td>
<td>650 (1.2)</td>
<td>33.3 (29.4-37.2)</td>
<td>&lt;.001</td>
<td>8.7 (6.3-11.1)</td>
<td>&lt;.001</td>
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<tr>
<td>Moderately low, 1500-2500 g</td>
<td>1000 (6.2)</td>
<td>28.4 (25.3-31.5)</td>
<td>&lt;.001</td>
<td>12.3 (9.9-14.7)</td>
<td>&lt;.001</td>
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<tr>
<td>Normal, &gt;2500 g</td>
<td>4900 (92.6)</td>
<td>24.8 (22.6-27.0)</td>
<td>&lt;.001</td>
<td>19.0 (17.6-20.4)</td>
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<td>Twin</td>
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<td>.001</td>
<td>18.6 (17.2-20.0)</td>
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<tr>
<td>Yes</td>
<td>950 (2.5)</td>
<td>30.5 (26.8-34.2)</td>
<td>&lt;.001</td>
<td>12.3 (9.4-15.2)</td>
<td>&lt;.001</td>
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<td>Siblings</td>
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<td>1</td>
<td>2200 (33.2)</td>
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<td>17.6 (12.5-22.6)</td>
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<td>≥4</td>
<td>200 (2.6)</td>
<td>24.8 (14.8-34.7)</td>
<td></td>
<td>15.1 (7.5-22.7)</td>
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<td>Maternal educational level</td>
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<tr>
<td>College graduate</td>
<td>1950 (26.4)</td>
<td>19.4 (16.7-22.1)</td>
<td>&lt;.001</td>
<td>13.3 (11.7-14.9)</td>
<td></td>
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<tr>
<td>Some college</td>
<td>1750 (26.7)</td>
<td>23.0 (19.9-26.1)</td>
<td>&lt;.001</td>
<td>18.2 (15.1-21.3)</td>
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<tr>
<td>High school degree or equivalent</td>
<td>1800 (28.9)</td>
<td>27.7 (23.8-31.6)</td>
<td>&lt;.001</td>
<td>20.2 (17.7-22.7)</td>
<td>&lt;.001</td>
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<td>Less than high school degree</td>
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<td>32.7 (28.6-36.8)</td>
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<td>23.8 (20.9-26.7)</td>
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<td>Income to poverty ratio</td>
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<td>&gt;3.00</td>
<td>1750 (25.7)</td>
<td>20.1 (17.4-22.8)</td>
<td>&lt;.001</td>
<td>15.1 (12.9-17.3)</td>
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<td>1.86-3.00</td>
<td>1800 (28.1)</td>
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<td>1.00-1.85</td>
<td>1550 (23.5)</td>
<td>28.5 (25.4-31.6)</td>
<td>&lt;.001</td>
<td>22.3 (19.2-25.4)</td>
<td>.002</td>
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<td>0.50-0.99</td>
<td>800 (12.7)</td>
<td>29.9 (25.4-34.4)</td>
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<td>20.6 (16.9-24.3)</td>
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<tr>
<td>&lt;0.50</td>
<td>750 (10.0)</td>
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<td>17.7 (13.8-21.6)</td>
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<td>Child residing with both biologic parents</td>
<td>5250 (79.1)</td>
<td>23.9 (21.7-26.1)</td>
<td>.003</td>
<td>17.6 (16.2-19.0)</td>
<td>.01</td>
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<td>No</td>
<td>1400 (20.9)</td>
<td>29.5 (26.0-33.0)</td>
<td></td>
<td>21.5 (18.6-24.4)</td>
<td>.01</td>
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<td>Maternal age, y</td>
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<td>≥35</td>
<td>1300 (17.5)</td>
<td>19.9 (16.6-23.2)</td>
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<td>18.0 (14.5-21.5)</td>
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<tr>
<td>&gt;30-35</td>
<td>1700 (25.6)</td>
<td>23.1 (20.0-26.2)</td>
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<td>16.5 (14.3-18.7)</td>
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<tr>
<td>&gt;25-30</td>
<td>1600 (25.7)</td>
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<td>&lt;.001</td>
<td>19.2 (16.5-21.9)</td>
<td>.47</td>
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<td>&gt;20-25</td>
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<td>30.1 (26.6-33.6)</td>
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<td>19.6 (16.9-22.3)</td>
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<tr>
<td>15-20</td>
<td>450 (7.3)</td>
<td>33.2 (27.1-39.3)</td>
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<td>19.8 (14.9-24.7)</td>
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<tr>
<td>Primary childcare arrangement</td>
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<tr>
<td>&lt;10 h/wk of nonparental care</td>
<td>3600 (54.4)</td>
<td>24.8 (22.3-27.3)</td>
<td></td>
<td>17.1 (15.5-18.7)</td>
<td>.14</td>
</tr>
<tr>
<td>In child’s home, nonparental&lt;sup&gt;d&lt;/sup&gt;</td>
<td>700 (9.5)</td>
<td>29.0 (23.3-34.7)</td>
<td>.08</td>
<td>21.4 (16.5-26.3)</td>
<td></td>
</tr>
<tr>
<td>Outside of the home, non-center-based</td>
<td>1400 (21.1)</td>
<td>26.6 (23.3-29.9)</td>
<td></td>
<td>19.0 (15.9-22.1)</td>
<td></td>
</tr>
<tr>
<td>Outside of the home, center-based</td>
<td>950 (15.0)</td>
<td>21.7 (18.4-25.0)</td>
<td></td>
<td>20.7 (17.2-24.2)</td>
<td></td>
</tr>
</tbody>
</table>

Abbreviations: BMI, body mass index (calculated as weight in kilograms divided by height in meters squared); CI, confidence interval.

<sup>a</sup> Sample sizes are unweighted, and each cell has been rounded to the nearest 50 to conform with reporting guidelines. Percentages may not total to 100 owing to rounding, and sample sizes may not total to 6650 owing to rounding or missing information. Information was missing on breastfeeding duration (<75 children); introduction of solid foods (<10); family dinner (<10); sleep (<10); maternal smoking status (<10); maternal BMI (<250); maternal depressive symptoms (<150); mother’s self-reported general health (<100); and birth weight (<100).

<sup>b</sup> Sampling weights applied; 95% CIs account for complex survey design.

<sup>c</sup> Rao-Scott (design-corrected) likelihood ratio χ².

<sup>d</sup> Includes children (<50) in multiple childcare arrangements, with none as the primary source of care.

drome can result from physiologic and behavioral responses to psychological stress. The physiologic mechanisms appear to be related to neuroendocrine pathways, such as those involving cortisol, insulin, leptin, and neuropeptide Y. The behavioral mechanisms may include impaired sleep or eating to cope with negative emotions. Empirical observations support the possibility that children with a secure pattern of attachment are more easily comforted in stressful situations and are better able to regulate negative emotions; these behaviors are re-
flected in healthier patterns of physiologic responses to stress. Secure attachment could reduce the risk for childhood obesity by preventing frequent or exaggerated stress responses from interrupting the normal functioning and development of physiologic systems that affect energy balance, body weight, and fat distribution. Securely attached children who are better able to regulate their emotions may be less likely to eat in response to emotional distress in early childhood when the systems in the limbic brain that regulate emotion and appetite are developing concurrently.

We noted an association between attachment security and obesity after controlling for measures of mother-child interaction (maternal responsiveness, child engagement, and child negativity). It is likely that children’s relationships with adults other than the mother, such as with fathers, grandparents, teachers, or childcare providers, also influence children’s attachment security. However, these other relationships were not assessed in this study.

Our research has limitations. We chose to restrict our analyses to children who had videotaped mother-child interaction at 24 months; this criterion excluded 1550 children. To the extent that the association between attachment security and obesity is different in children with and without missing data, there is a possibility of bias in our estimates. We controlled for a large number of potentially confounding variables, but we cannot exclude the potential for bias due to uncontrolled confounding or measurement error. We may also have “over-controlled” for potential confounding by including too many variables, such as television/video/DVD viewing and the frequency of eating family dinners, which could be part of the causal pathway between attachment security and obesity. We used logistic regression models to estimate ORs; when an outcome is not rare, the OR will be farther from 1 than the equivalent risk ratio. Height and weight of children were directly measured, but a limitation of all analyses that rely on ratios (eg, BMI) of weight to height to assess obesity is that these measures reflect body build and musculature in addition to adiposity. More direct adiposity measures are difficult to obtain in large cohorts, and BMI is typically used despite the potential for some misclassification. Our measure of attachment security was derived from observations of the mother and child in their home. It is possible that behavior exhibited on the day of the assessment was not representative of children’s typical behavior.

Obesity is a complex condition, and the high prevalence in children in the United States is the result of multiple causes. Solutions to the public health problem of obesity must take many forms, and successful approaches to the prevention of obesity in early childhood are lacking. We provide evidence that insecure attachment in 24-month-old children is a potential risk factor for early childhood obesity. To our knowledge, data about this risk factor have not been reported.

If these findings are confirmed in other studies, it may be possible to develop obesity prevention strategies that include working with parents to increase children’s attachment security. Parents play a key role in the development of the stress response in how they protect children from extreme levels of stress, respond supportively and consistently to normal levels of stress, and model behavioral responses to stress. The role of secure attachment in contributing to positive social and emotional outcomes for young children has been established, and evidence from randomized trials suggests that it is possible to increase children’s attachment security. Making obesity prevention another potential outcome of interventions to promote attachment security could revitalize strategies to improve parenting skills, aligning efforts in the fields of pediatrics, nutrition, public health, and child development.

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Correspondence: Sarah E. Anderson, PhD, Division of Epidemiology, College of Public Health, The Ohio State University, 320 West 10th Ave, Starling Loving Hall, Room B216, Columbus, OH 43210 (sanderson@cph.osu.edu).

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Study concept and design: Anderson and Whitaker. Analysis and interpretation of data: Anderson and Whitaker. Drafting of the manuscript: Anderson and Whitaker. Critical revision of the manuscript for important intellectual content: Anderson and Whitaker. Statistical analysis: Anderson and Whitaker. Obtaining funding: Anderson and Whitaker. Administrative, technical, and material support: Whitaker. Study supervision: Whitaker.

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