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Fussy infants find food more rewarding, putting them at higher risk for obesity

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In the study, infants were taught to press a button to earn a reward. Credit: University at Buffalo

Babies that seem to get upset more easily and take longer to calm down may be at higher risk for obesity while babies that exhibit more "cuddliness" and calm down easily are less likely at risk, according to a University at Buffalo study.

The purpose of the research, published July 22 online ahead of print in *Childhood Obesity*, is to explore new ways to identify infants at risk for

becoming overweight or obese in order to intervene as early as possible.

"The research tells us that differences in behavior begin as early as infancy and those differences can influence health behaviors that impact future health risks," said Kai Ling Kong, PhD, first author and assistant professor of pediatrics in the Jacobs School of Medicine and Biomedical Sciences at UB. Kong conducts research in the Division of Behavioral Medicine in the UB Department of Pediatrics.

In the study, 105 infants from nine to 18 months old were taught to press a button to earn a reward. They completed the task twice, and received either a piece of their favorite food as a reward or ten seconds of a non-food reward, such as blowing bubbles, watching a Baby Einstein DVD or hearing music. Parents were instructed to say only specific phrases while the child completed the task.

As the task went on, it became increasingly difficult for the infant to earn the reward as they had to press the button more times. The amount of "work" they were willing to do was calculated by counting the number of times the child was willing to press the button to get the reward.

The child's temperament was assessed through a detailed, 191-question online questionnaire that parents completed.

"We found that infants that rated higher on what we call cuddliness —the baby's expression of enjoyment and molding of the body to being held—had lower food reinforcement," explained Kong. "That means they were willing to work more for a non-food reward versus a food reward. So an infant who enjoyed being held closely by a caregiver was less motivated to work for food."

The researchers measured cuddliness by asking parents specific questions such as, "When being held, how often did your baby pull away

or kick?" and "While being fed on your lap, how often did your baby snuggle even after they were done?"

Infants received either a piece of their favorite food as a reward or ten seconds of a non-food reward, such as blowing bubbles. Credit: University at Buffalo

Infants who rated high on how quickly they could recover from crying or being distressed also were less motivated to work for food compared to non-food alternatives.

Conversely, infants who rated lower on cuddliness and who took longer to recover from distress and arousal, had higher food reinforcement—that is, they were willing to work harder for a food reward.

Kong said that correlating these differences in temperament with their relative food reinforcement will help researchers identify ways to encourage healthier diets among the youngest individuals.

Parents who identify these characteristics in their infants also can benefit, she said.

"If a parent sees high relative food reinforcement in their child, it is not cause for immediate concern," she said. Instead, she noted, the parent could evaluate their child's relationship to food, encouraging the child to engage in activities other than eating, especially as a reward.

"Using rewards other than food, such as a trip to the playground or engaging in active play with their parents, may help reduce the child's tendency to find pleasure in food," she said. Making available a wide array of toys, activities and playmates so food isn't the main focus and sole source of pleasure also can be beneficial.

Kong added that children can learn healthier lifestyles when parents model healthy behaviors themselves, pay close attention to children's satiety cues (noting when they are full) and don't immediately use food to comfort a child who is crying or fussing.

Along with Kong, other UB co-authors are Rina D. Eiden, PhD, senior research scientist, Research Institute on Addictions; Leonard H. Epstein, PhD, SUNY Distinguished Professor and director of the Division of Behavioral Medicine in the Department of Pediatrics; Stephanie Anzman-Frasca, PhD, assistant professor; Denise M. Feda, PhD, research assistant professor; Corrin L. Stier, senior research support specialist, all in the Department of Pediatrics and Neha N. Sharma, PhD, a student in the Jacobs School of Medicine and Biomedical Sciences.

Provided by University at Buffalo

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