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Abstract

Toddlerhood, the period from 12 to 36 months, represents striking changes in children’s development. Along with mastery of skills such as walking, talking, self-feeding, sleeping through the night, and bowel and bladder control, toddlers strive for autonomy as they learn to regulate their emotions. Toddlers’ increasing autonomy impacts feeding behavior and may increase or restrict their food exposures. Baby-led weaning, allowing infants to participate in the family meal by selecting food and feeding themselves, exposes children to the family diet. Food neophobia, a normal developmental phase whereby children reject novel foods, may limit children’s exposure to high-quality foods. Food preferences formed during toddler and preschool years often persist into adulthood, making toddlerhood an ideal time to help children build healthy habits. Toddlerhood can be both joyful and challenging as children acquire new skills and assert their autonomy. Effective parenting practices include providing age-appropriate structure and opportunities for toddlers, reading toddler’s signals, and responding promptly, appropriately, and with nurturance. Responsive parenting ensures that toddlers receive the guidance and nurturant care needed to develop healthy feeding behavior and emotional well-being.

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Introduction

Toddlerhood (age 12–36 months), the transition between infancy and the preschool years, is a period of multiple developmental changes. During toddlerhood, children consolidate many of the skills that begin to emerge during infancy. Walking with a wide-based gait becomes steady walking, running, and jumping. Single words become multiword sentences. Being fed by a caregiver becomes self-feeding along with food preferences. These advances represent toddlers’ increasing neurocognitive, motor, and language skills along with their desire for autonomy and their emerging ability to regulate their behavior and emotions. This chapter begins with a review of the development changes that occur during toddlerhood and then addresses toddler eating behavior, focusing on how toddlers’ advancing developmental skills impact their eating behavior, dietary preferences, and mealtime habits.

Toddler Development

The home is a central environment for toddlers [1], with caregivers helping toddlers develop daily habits and routines. Patterns developed in toddlerhood related to diet, sleep, and physical activity set the stage for lifestyle patterns throughout childhood and adolescence [2]. Toddlers’ increasing autonomy impacts their feeding behavior and may increase or restrict their food exposures. Dietary patterns established during toddlerhood often persist into adulthood, making toddlerhood an ideal time to increase children’s dietary diversity [1]. Toddlers benefit from parenting that is responsive, while ensuring that their introduction to the family meal includes exposure not only to nutrient-rich food but also to healthy mealtime behaviors.

Growth, Motor Skills, and Physical Activity

During toddlerhood, the rate of weight and height gain slows down from the rate of growth during infancy, body fat declines, muscle tone increases, and body proportions change as toddlers take on the physical appearance of children rather than infants. Excess weight gain during toddlerhood can increase the risk of overweight and obesity throughout childhood and adolescence [3, 4], which renders toddlerhood an ideal time to establish healthy dietary and physical activity habits. In 2014, 14.5% of US children aged 2–4 years who were participating in the Special Nutrition Supplemental Program for Women, Infants, and Children were obese (age- and sex-specific body mass index ≥ 95th percentile) [5], underscoring the increasing rates of excess weight gain in toddlers that have been observed globally.
Gross motor skills progress rapidly as toddlers become adept at walking and running without falling. Balance improves, and they are eager to jump and climb. Gradually toddlers build coordination, although skills such as riding a tricycle and catching a ball are often not accomplished before age 3 years.

Gross motor skills and physical activity are related and stimulate reciprocally. A recent review found that among children under 5 years of age, moderate-to-vigorous physical activity was consistently associated with motor development, fitness, and bone and skeletal health [6]. The World Health Organization has recently released guidelines for physical activity among children under 5 years of age [7], emphasizing the importance of toddlers developing appropriate physical activity habits.

By 12 months of age, oral motor skills, including tongue laterality, have progressed to enable toddlers to handle increasingly complex food by chewing, moving food to the back of the oral cavity, and swallowing. Fine motor skills also advance as toddlers practice picking up and manipulating small items, such as blocks and toys. They learn to stack blocks and to color with crayons. Applied to self-feeding, toddlers progress from using their hands to using utensils, and from drinking from a cup with a protective spout to an open cup. Although the advancing skills are often accompanied by spills and messes, they add to toddlers’ sense of mastery and autonomy.

Learning

Toddlers learn through 3 primary processes: observation/imitation, exploration, and play. Imitation begins within the first 72 h after birth as newborns imitate mouth openings and tongue protrusions [8]. Young children continue to learn by observing and modeling [9]. Exploration occurs through toddlers’ developing sensory and motor skills, illustrated by their interest in touching, smelling, and putting things into their mouth – both food and nonfood items. Through play, toddlers practice their emerging skills, initially by touching items to experience their sensations and then by manipulating them to figure out how they can be used. By approximately 2 years of age, toddlers develop symbolic thinking and the capacity to solve problems mentally rather than exclusively through trial and error (e.g., ability to place a square block into a square hole). In Piagetian terms, by mid-toddlerhood they progress from the sensorimotor period of relying on their senses to the preoperational period of figuring out how things work or how they come apart. Applying imitation and exploration through active play enables toddlers to learn and to develop autonomy and a sense of mastery – understanding their environment through their own actions.

The desire to explore and touch is so strong that toddlers will repeatedly touch things, even if warned that the objects are dangerous or off limits. Tod-
Toddlers often strive to engage in activities and touch things that they observe family members doing even if they lack the prerequisite skills. Consequently, the prevalence of unintentional injuries is high during toddlerhood. In 2018, the prevalence of deaths due to unintentional injuries among 2-year-old children in the United States (9.9/100,000) exceeded the prevalence of deaths among children aged 4–15 years more than twofold (3.9/100,000), with deaths among 3-year-old children at 6.7/100,000 [10]. It was not until children reached 16 years of age (the age when youth can obtain a driver’s license) that the prevalence of deaths exceeded that of toddlers (11.4/100,000). Although toddlers are increasing in mobility, exploration, and problem-solving skills, their ability to recognize danger is not well developed, and their risk of injuries is high. Thus, toddlers require careful supervision to avoid potential hazards, often within their home.

**Language**

Toddlers’ language skills increase along with their advancing cognitive skills. Toddlers in multilingual settings learn to understand and speak multiple languages, and most toddlers are speaking in sentences that can be understood by nonfamily members by age 3 years. Toddlers also use their language skills to engage in pretend play, often re-enacting situations that they observe in daily life. Their ability to use symbols and imagination to engage in pretend play enables toddlers to re-enact household issues or to practice make-believe interactions with others.

Advances in language include both the number of words that children understand and speak and also complex language-specific structures. Children benefit from language-rich environments, based on contingent language in which caregivers talk about what the toddler is experiencing, and build reading into daily routines. Dialogic reading, with books becoming a stimulus for turn-taking conversations between toddlers and caregivers, has been shown to promote literacy in multiple countries [11]. Dialogic reading is the basis of Reach Out and Read, a program that has been implemented globally in homes (www.reachoutandread.org).

**Sleep**

Sleep patterns consolidate during toddlerhood as toddlers sleep through the night with a mid-day nap and shift from cribs to beds [12]. The American Academy of Pediatrics recommends that toddlers receive 11–14 h of sleep daily with bedtime before 9:00 PM [13]. Toddlers who receive less than the recommended amount of sleep are at increased risk for excess weight gain, emotional dysregulation, impaired growth, injuries, and lower academic achievement. In addition,
shortened nighttime sleep increases the likelihood of next-day sedentary behavior [14]. With the exception of sleeping, toddlers should not be sedentary or inactive for more than 1 h at a time.

Attachment and Separation Anxiety
Infants differentiate familiar from unfamiliar people and form attachment relationships with primary caregivers that continue into toddlerhood [15]. Toddlers often use attachment relationships as a “secure base” to explore new situations. That is, knowing that the attachment figure is nearby, toddlers feel secure exploring new situations. Toddlers may also experience separation anxiety and feel anxious when primary caregivers are out of sight, illustrating a lack of understanding that the separation is temporary. Separation anxiety can be stressful for toddlers and their caregivers, particularly because toddlers may also experience frustration when they are reunited with their caregivers, particularly if they are temperamentally “difficult.” In most situations, separation anxiety abates as toddlers gain more sophisticated object permanence skills and comfort in dealing with novel people and situations.

Temperament refers to children’s personality or behavioral style in handling situations. The 3 primary domains of temperament are “easy,” “slow to warm up,” and “difficult.” A child with an easy temperament goes with the flow, adjusts to changes in patterns of eating, sleeping, and playing without difficulty. A child with a slow-to-warm-up temperament may be hesitant initially but slowly adapts. A child with a difficult temperament has trouble adapting to changes or new situations, and may be negative and difficult to handle. Although temperament is thought to be intrinsic in nature, caregivers can learn to manage their toddler’s temperament by providing opportunities for the toddler to experience success and learn to adapt to novel or changing situations.

Autonomy and Independence
The acquisition of multiple skills, along with a desire to explore and model what they observe, contributes to toddlers’ sense of autonomy. As their mobility increases, toddlers want to do things themselves, often without help from others. Effective caregivers have rules for toddlers to enhance their development, to socialize them as family members, and to protect them from potential dangers. When toddlers perceive that rules are in conflict with their independence, they experience frustration. With their need to rely on caregivers, and their limited impulse control, temper tantrums can result. Temper tantrums are difficult for toddlers and caregivers. With effective management, often by helping the toddler focus on developmentally appropriate activities, temper tantrums can be prevented. As toddlers mature and acquire more cognitive and self-regulatory
skills and better impulse control, their ability to handle autonomy and independence improves, and temper tantrums can be averted.

In summary, child development is cumulative and dynamic during toddlerhood, building on skills acquired during infancy. Gross motor advances (crawling, walking, running, and climbing) enable toddlers to explore their physical environment as they engage in goal-directed behavior. Fine motor advances enable toddlers to pick up small objects, manipulate eating utensils, and self-feed. Oral motor and language developments enable toddlers to chew complex foods, to express themselves and communicate, and to negotiate. With enhanced cognition, toddlers can solve problems, recall the location of hidden objects, and play simple games. Toddler’s social development includes prosocial skills, such as empathy and recognition of others’ emotions, and self-regulation, such as controlling their thoughts or behavior in response to specific contexts and situations. These emerging skills bring increasing autonomy, often accompanied by impulsivity to satisfy their desires immediately. When combined with toddlers’ changing nutritional needs, their increasing autonomy can present challenges to caregivers, especially during meals.

**Toddler Eating Behavior**

The World Health Organization recommends exclusive breastfeeding of infants until approximately 6 months of age and then transition to complementary feeding, defined as the period when breast milk alone is no longer sufficient to meet infants’ nutritional requirements. Complementary feeding extends from approximately 6 to 18 months well into toddlerhood. Breastfeeding often continues in the second year as food occupies an increasingly larger proportion of toddlers’ diet. Guidelines for complementary feeding have focused primarily on toddlers’ nutrient requirements and advances in flavor and texture as their diet expands and begins to approximate the family diet [16].

**Baby-Led Weaning**

The traditional method of complementary feeding, which begins at approximately 6 months of age, is to serve purees, spoon-fed by the caregiver, and gradually increase the flavors and consistency of foods until approximately 12 months of age, when the child transitions to the family diet [17]. Baby-led weaning, introduced in England in 2008, provides softened, bite-size foods directly to the child. Children choose when and what food they will eat (from a choice of healthy options), the rhythm of the meal, and the amount of food that they will eat while primarily feeding themselves [18]. Baby-led weaning is based on pre-
assumptions that young children have the motor skills to self-feed, along with the regulatory skills to signal hunger and satiety. Caregivers play supportive, rather than direct roles, with infants often seated with the family during meals, which facilitates modeling and enables toddlers to be included in mealtime interactions.

Three recent reviews [18–20] found that baby-led weaning typically occurs in the context of the family meal, with the child consuming food that is softened and cut into bite sizes. In comparison with traditional methods of complementary feeding, baby-led weaning was positively associated with infants’ self-regulation and satiety, with timing of the initiation of complementary feeding consistent with guidelines, and with adequacy of weight gain, with some evidence of overweight among the spoon-fed group and of underweight among the baby-led group. Although there were no group differences in rates of choking or micronutrient intake, there was some suggestion that the baby-led group was at higher risk of choking and of not obtaining adequate micronutrients, often because micronutrient-rich food was offered infrequently [18]. Advantages of baby-led weaning included exposure to a wide variety of food, more interaction with the food, and exploration of multiple textures. Baby-led weaning has been adopted by families in many countries, including England, New Zealand, and Brazil, for example. Evidence addressing the nutrient intake and long-term impact of baby-led weaning on children’s nutrient intake and eating patterns is emerging.

Food Neophobia

Food neophobia, defined as refusal or fear to eat unfamiliar foods, is a normal developmental phase during toddlerhood that declines during childhood. From an ethological perspective, neophobia is adaptive because it protects children from novel foods that may be harmful or bitter. Food neophobia differs from selectivity or pickiness, defined as specific food preferences and dislikes, regardless of familiarity. A recent systematic review and meta-analysis of neophobia and picky eating emphasized the relevance of considering the social context and bidirectional parent-toddler aspects of feeding, including factors at the biological, child, parent, and household levels [21].

Evidence has shown that 10 or more presentations of the novel food may be necessary to overcome neophobia [21]. Food neophobia is often managed through familiarity and modeling with family members eating the novel foods. If familiarity and modeling are not effective, caregivers may remove the novel food from the toddler’s diet or attempt to force the toddler to eat the novel food. Limiting the toddler’s food choices denies access to healthy foods and teaches the toddler the power of refusal. Using force or pressuring techniques may in-
crease resistance and lead to confrontational mealtimes, particularly among children who are temperamentally difficult.

Neophobia can transition into pickiness, especially if caregivers attempt to use controlling or coercive strategies. The autonomy that toddlers have developed makes them want to be agents of their own preferences and actions [22]. They may resist food that looks or smells unfamiliar or unappealing or because they can resist. If their resistance results in conflict, a negative pattern may result whereby caregivers perceive the toddler to be resistant or picky, and they then implement maladaptive strategies. A reconceptualization of neophobia has been suggested to consider the roles and perceptions of both caregivers and toddlers, to reduce the tension in their interaction, to move away from the “picky eater” term, and to focus on caregivers’ expectations of children’s eating and mealtime interactions [22].

**Responsive Feeding**

Responsive feeding, a derivative of responsive parenting, is based on the principle that feeding young children is bidirectional and guided by toddlers’ internal sense of hunger and satiety. Responsive feeding is embedded in a parenting style that includes both structure and responsivity [23]. The structure refers to caregivers’ establishing routines, with consistent meal patterns, timing, context, food choices, and expected behavior (e.g., eating food, no throwing food). Distractions, such as television and other screens, are removed, and meals are coordinated with others eating to provide appropriate modeling (Fig. 1). Responsivity is guided by the caregiver’s perceptions of the toddler’s characteristics, including size, health, feeding skills, and especially by the toddler’s signals of

![Responsive Feeding Diagram](image)
hunger and satiety. Caregiver responses are prompt, clear, nurturant, and developmentally appropriate. When the toddler signals satiety, the caregiver ends the meal and maintains a pleasant demeanor.

A recent review identified 3 food parenting practices used with young children, including toddlers: coercive control, structure, and autonomy support (Fig. 2) [24]. Coercive control refers to controlling practices, including pressure to eat, threats, and bribes, and using food to control negative emotions. Structure refers to rules and limits, limited/guided choices, monitoring, meal- and snack time routines, modeling, food availability and accessibility, and food preparation. Autonomy support includes facilitating self-feeding, child involvement, and encouragement. The structure and autonomy support constructs are consistent with responsive feeding guidelines.

In spite of global recommendations that responsive feeding be implemented, there is no consensus on measures to be used to measure responsive feeding. A recent review identified 15 instruments developed for children from birth to 2 years of age and 28 for children aged 3–5 years [25]. Only 3 of the 43 instruments showed rigorous validation and reliability testing. Most relied on caregiver report and had not been validated against observations. There is clearly a need for a validated assessment of responsive feeding for toddlers to facilitate communication across investigations and the evaluation of intervention trials.
In summary, toddlerhood is a transitional period that can be both joyful and challenging, as children acquire new skills and assert their autonomy. Feeding is particularly challenging because there are clear expectations for caregivers to ensure that their toddlers receive adequate nutrients. Recently recognized strategies, including baby-led weaning, may facilitate the transition to complementary feeding and the family diet. However, additional research is needed to ensure that infants can feed themselves safely and acquire micro- and macronutrients required. Although neophobia is developmentally normal and typically resolves, it introduces challenges to families and can transition into pickiness. Effective parenting practices include the structure of providing healthy food and age-appropriate settings and opportunities for toddlers to feed themselves. In addition, responsive feeding requires caregivers to read toddlers’ signals and to respond promptly, appropriately, and with nurturance. This pattern ensures that toddlers receive the guidance and nurturant care that is needed to develop healthy feeding behavior and emotional well-being [26].

Conflict of Interest Statement

Maureen M. Black has no conflicts of interest.

References


