



## Observed differences in child picky eating behavior between home and childcare locations



Virginia Luchini <sup>a</sup>, Salma Musaad <sup>b</sup>, Soo-Yeun Lee <sup>c</sup>, Sharon M. Donovan <sup>d,\*</sup>

<sup>a</sup> Division of Nutritional Sciences, University of Illinois at Urbana-Champaign, 905 S. Goodwin Ave, Urbana, IL 61801, USA

<sup>b</sup> Department of Human Development and Family Studies, University of Illinois at Urbana-Champaign, 2031 Doris Kelley Christopher Hall, 904 W. Nevada Ave, Urbana, IL 61801, USA

<sup>c</sup> Department of Food Science and Human Nutrition, University of Illinois at Urbana-Champaign, 351 Bevier Hall, MC-182, 905 S. Goodwin Ave, Urbana, IL 61801, USA

<sup>d</sup> Department of Food Science and Human Nutrition, University of Illinois at Urbana-Champaign, 339 Bevier Hall, 905 S. Goodwin Ave, Urbana, IL 61801, USA

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### ABSTRACT

Picky eating (PE) is a common mealtime difficulty that is reported by up to 50% of caregivers. Most of the research to date on PE has focused on parents, even though millions of children also eat meals in home- or center-based childcare settings. Currently, little is known about PE behaviors manifested by the child across the home and childcare settings, or how these behaviors differ between home-based childcare (HBCC) and center-based childcare (CBCC) locations. The objectives of this study were to compare PE behaviors between the child's home and HBCC or CBCC environments, and compare PE behaviors between HBCC and CBCC environments. Children, ages 3–5 years, were recruited from CBCC (n = 26) or HBCC (n = 24) locations. Caregivers and children were videotaped consuming two different lunchtime meals in their home and childcare. Picky eating behaviors were coded from the videos using a codebook created for the study. Observational results showed that children in CBCC displayed more PE behaviors when at home than at childcare, while HBCC children displayed PE behaviors more similarly between the two locations. Thus, interventions to reduce PE behaviors should be personalized for location-specific intervention programs focused on raising healthy eaters across multiple locations.

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### 1. Introduction

Food preferences are formed early in life and tend to persist into adulthood, making childhood an important time to support the development of healthy eating habits (Birch, Savage, & Ventura, 2007; Blissett, 2011; Neelon & Briley, 2011). A variety of factors influence the formation of food preferences, including genetics (Birch, 1999), food availability and exposure (Hearn et al., 1998; Wardle, Herrera, Cooke, & Gibson, 2003), caregiver feeding styles (Hubbs-Tait, Kennedy, Page, Topham, & Harrist, 2008; Patrick & Nicklas, 2005), and the mealtime environment (Birch & Fisher, 1998).

A common barrier to the development of healthy eating habits is a child's picky eating (PE) behavior (Carruth, Ziegler, Gordon, &

Barr, 2004). Picky eating is often classified as having low dietary variety and rejecting both familiar and unfamiliar foods (Carruth et al., 1998a, 2004; Dovey, Staples, Gibson, & Halford, 2008). Picky eating behaviors have been linked to depression (Zucker et al., 2015), increased risk for developing an eating disorder (Marchi & Cohen, 1990), underweight (Dubois, Farmer, Girard, & Peterson, 2007), and parental concern about the child's growth (Cullen, Baranowski, Rittenberry, & Olvera, 2000a).

Much of the existing literature on PE involves parents even though millions of children also eat meals at childcare in the presence of their childcare provider. It is estimated that 33% of children spend an average of 35 h per week at childcare where they can consume up to one half of their daily nutrient needs (Dev, McBride, & STRONG Kids Research Team, 2013; Larson, Ward, Neelon, & Story, 2011; Laughlin, 2013, pp. 1–23). This makes the childcare setting a prominent influencer in childhood eating habit formation.

The most common type of non-parental childcare is center-

\* Corresponding author.

E-mail addresses: [luchini1@illinois.edu](mailto:luchini1@illinois.edu) (V. Luchini), [smusaad@illinois.edu](mailto:smusaad@illinois.edu) (S. Musaad), [soolee@illinois.edu](mailto:soolee@illinois.edu) (S.-Y. Lee), [sdonovan@illinois.edu](mailto:sdonovan@illinois.edu) (S.M. Donovan).

based childcare (CBCC), which is attended by 67% of children in non-parental childcare arrangements (Laughlin, 2013, pp. 1–23). Center-based childcares are a structured, “school-like” environment; typically they contain multiple classrooms comprised of children of similar ages separated in each classroom with a set teacher to student ratio. Center-based childcares are usually well regulated with policies the childcare must follow (American Academy of Pediatrics, National Resource Center for Health, Safety in Child Care (US), American Public Health Association, & United States. Maternal & Child Health Bureau, 2002).

Home-based childcares (HBCC) are environments where children are cared for in the caregiver's house and encompass around 30% of children in non-parental childcare arrangements (Laughlin, 2013, pp. 1–23). There are usually fewer children in HBCC than in CBCC and typically there is only one caregiver (National Institute of Child Health and Human Development (NICHD) Early Child Care Research Network, 2000). Home-based childcares have more freedom in terms of policies that need to be followed, especially depending on their licensing status or involvement in programs such as the Child and Adult Care Food Program (Kaphingst, French, & Story, 2006).

While millions of children consume meals at childcare and at home, to our knowledge no studies have investigated how child mealtime behavior differs between these environments. Anecdotally, it is common for parents to report that children are pickier at home than at childcare (MacInnes, 2012), but to our knowledge no scientific studies have confirmed this by observing the child consume meals both at home and at their childcare location. Interestingly, previous research conducted at the University of Illinois showed that the parent and childcare provider of the same child had different views on the child's level of pickiness, but the researchers did not determine why their perceptions differed (MacInnes, 2012).

Additionally, even though 1/3 of children in childcare attend HBCC, most studies focus on CBCC, leaving a gap in the literature addressing HBCC. Some studies have investigated child well-being via higher caregiver sensitivity and lower noise levels in home versus center-based childcare centers and found that well-being was greater for children in home-based centers (Groeneveld, Vermeer, van IJzendoorn, & Linting, 2010). Other studies have found that families with higher education tend to utilize center-based childcare centers vs home-based (Fuller, Holloway, & Liang, 1996). These differences in center vs. home-based childcare centers could result in differences in behavior. However, very few studies investigate the feeding environment between the types of childcare and, to our knowledge, none have compared children's PE behavior between the two settings.

Therefore, the objectives of this study were to compare PE behaviors between the child's home and their respective childcare environment, and compare PE behaviors between children who attend HBCC versus those who attend CBCC. It was hypothesized that children would express more PE behaviors in their home than in their childcare environment. Additionally, it was hypothesized that children would be pickier at HBCC than at CBCC given the potential similarities between the family home and the caregiver's home.

## 2. Methods

### 2.1. Participants

Center- and home-based childcare providers in the Champaign-Urbana area were contacted via phone call, community group meetings, or flyers to participate in the study between March of 2013–November of 2013. Three classrooms from one CBCC on the

University of Illinois campus and twelve HBCCs were recruited. Parents utilizing these childcares were then invited to participate in the study. All materials and methods were approved by the University of Illinois Institutional Review Board.

A total of 50 child-parent pairs were recruited, 26 from CBCC and 24 from HBCC. Participation requirements included having at least one child aged 3–5 years with no food allergies. The 3–5 year old age range was selected based on previous literature indicating that picky eating behaviors peak during this age range (Cardona Cano et al., 2015; Carruth et al., 1998a). If parents had two children meeting the inclusion criteria, both children could be enrolled in the study, if desired. This occurred once each for the CBCC and HBCC groups, resulting in 26 children and 25 parents from CBCC and 24 children and 23 parents from HBCC.

### 2.2. Observations

Children were observed consuming lunch in their home and childcare locations. To control for changes in behavior due to differences in food, everyone present at the meal was given the same food during every observational visit. Parents, childcare providers, and children were instructed to act as they typically would during a normal lunch. Children were observed four times, twice at home, once consuming a “non-popular” meal and once consuming a “popular” meal, and twice at childcare consuming the same “non-popular” and “popular” meals. This resulted in a total of 200 mealtime observations. The “non-popular” meal consisted of a whole wheat sandwich with turkey and cheese, fresh broccoli, ranch dressing, and grapes and contained 384 kcal (Fig. 1a). The “popular” meal consisted of grilled chicken strips, tortilla chips with salsa, and a banana and contained 481 kcal (Fig. 1b). Non-popular and popular menus were created based on previous literature reporting typical toddler food preference and consumption patterns (Boquin, Smith-Simpson, Donovan, & Lee, 2014; Fox, Pac, Devaney, & Jankowski, 2004; MacInnes, 2012). Both meals met the criteria for healthy school lunch and contain foods that are readily available and common within the American diet. Because the CBCC lunches were on a rotating menu, both meals became part of the CBCC rotating menu lunch schedule, therefore exposing CBCC children to the food items within the meal before the observations were conducted. Due to the variability in how each HBCC offered and served lunch, the same could not be said regarding HBCC. Therefore it is not known if HBCC children had been exposed to the foods in the meals provided during observed lunches, though each of the foods in the meals are commonly found in the American diet.

Due to the recruitment method of the study in which parents and children were recruited through the childcare providers, the first contact for the meals during the observations was in almost all cases at childcare. However, the average duration between observations at childcare and the family home was 30 days. This ensured that observations between locations were not too close together, which prevented potential changes in mealtime behavior due to participant fatigue of the food being provided during the observations.

Mealtimes were recorded using video cameras discreetly placed in the meal environment. Upon arrival at the mealtime location, researchers would set up the cameras, leave the house/childcare, and return once the meal was over. This was done to minimize alterations in behavior in participants due to the presence of researchers. After the meal was complete, caregivers were asked to rate how typical the meal was. A typical meal was defined by the caregiver. If the caregiver responded that the meal was “Fairly Typical” or “Very Typical” it was considered typical and not rescheduled. Atypical meals were rescheduled (6 out of 200, or <5% of all meals) until a typical meal was captured on camera.

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