Research Brief

Influence of Screen-Based Peer Modeling on Preschool Children's Vegetable Consumption and Preferences

Amanda E. Staiano, PhD; Arwen M. Marker, BA; Johannah M. Frelier, BS; Daniel S. Hsia, MD; Corby K. Martin, PhD

ABSTRACT

Objective: To determine the influence of screen-based peer modeling on children's vegetable consumption and preference.

Methods: A total of 42 children aged 3–5 years were randomly assigned to view individually a video segment of peers consuming a modeled vegetable (bell pepper), vs a nonfood video segment or no video. Analysis of covariance models examined bell pepper preference and consumption during initial video exposure (day 1) and without video exposure (days 2 and 7), adjusted for age, sex, body mass index, and initial bell pepper consumption.

Results: Children in the vegetable condition ate more bell peppers (15.5 g) than did those in the control condition (5.9 g; $P = .04$; model $\eta^2 = 0.85$) on day 7, with no differences on days 1 or 2. Among children who ate the modeled vegetable, those in the vegetable DVD condition reported greater preference for eating the vegetable again ($P = .01$).

Conclusions and Implications: Screen-based peer modeling is a promising tool to influence children's vegetable consumption.

Key Words: food preferences, child, preschool, video (*J Nutr Educ Behav*. 2016;■:1-5.)

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INTRODUCTION

One-third of American children aged ≤ 4 years consume no vegetables on a typical day.[1] Increased vegetable consumption is linked to improved diet quality and decreased total energy intake.[2] Food neophobia, or the fear of unfamiliar foods, may account for many preschoolers' low vegetable consumption.[3] Early life experiences involving vegetables may have a lasting positive impact on future dietary habits.[4,5]

Peer modeling influences preschoolers' food choices. In a prior trial, 17 children aged 2–4 years tasted and reported preference for 9 vegetables; then each child was seated in a lunchroom with 3 or 4 peers who selected the target child's least preferred vegetable to eat. By the fourth day of peer modeling, the majority of target children selected the previously least preferred vegetable to model peer behavior.[4] Because digital screens have become ubiquitous in children's lives, peer models are now being integrated into media platforms including DVDs. The *Food Dudes* DVD, which displays cartoon animated peers who enjoy eating fruits and vegetables in conjunction with an external rewards system (ie, stickers given for tasting or eating the fruit), significantly increased consumption of the modeled fruits and vegetables among children aged 4–11 years.[6] It is unknown whether screen-based authentic peers (ie, not animated) will influence younger viewers' food choices and preferences without an external rewards system that is contingent on behavioral response.

The current study was modeled on social learning theory, because children develop new patterns of behavior both by observing others and by direct experience.[7] The primary purpose was to examine the efficacy of screen-based authentic peer modeling on preschoolers' vegetable preference, selection, and consumption. It was hypothesized that children randomly assigned to view a DVD of peers consuming a modeled vegetable would be more likely to prefer, select, consume, and request the modeled vegetable, compared with children viewing a nonfood video segment or no video, during the initial exposure and 1 day and 1 week later.

METHODS

Study Design

This was a randomized controlled trial in which children were randomly assigned to 1 of 3 conditions: the *Copy-Kids Eat Fruits and Vegetables* DVD, the *Copy-Kids Brush Teeth* DVD, or a no-DVD control.

Pennington Biomedical Research Center, Baton Rouge, LA

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Address for correspondence: Amanda E. Staiano, PhD, Pennington Biomedical Research Center, 6400 Perkins Rd, Baton Rouge, LA 70808; Phone: (225) 763-2729; Fax: (225) 763-2887; E-mail: amanda.staiano@pbrc.edu

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Participants and Recruitment

A total of 42 children, aged 3–5 years and attending 1 of 2 full-day preschools, were recruited as participants. Pennington Biomedical Research Center's Institutional Review Board approved all study procedures and parents provided written informed consent. All procedures were explained in child-friendly terms, and a child could refuse to take part in the study at any time. Figure 1 shows the CONSORT diagram.

Procedures

After the consenting process, parents completed a survey that reported children's demographic information and eating behaviors. The researchers used block randomization to distribute age and sex evenly across conditions using a randomization schedule generated with SAS programming (SAS PROC PLAN, SAS Institute Inc., Cary, NC, 2013). Each of the 3 study visits lasted 15 minutes and occurred at the preschool during the child's normal morning snack time in a separate area that was quiet and free of distractions. Children attended study visits on 2 consecutive days (days 1 and 2) and a final visit 1 week later (day 7 ± 2 days).

Depending on the condition, on day 1 the child viewed 1 of 2 video clips or sat quietly for 7.5 minutes. Two plates of snacks (the modeled vegetable and a comparison food) were placed in front of the participant in a standardized format (green bell peppers on the right and dry cereal on the left) on separate, identical white Styrofoam plates (Figure 2). Children were instructed to eat as much or as little as they wished during this time. The video segments were played concurrently during the food presentation; a timer was set for 7.5 minutes for the control condition. Study staff weighed 0.5 cups of the modeled vegetable (ie, approximately 80 g of raw, sliced green bell pepper) and 0.5 cups of the comparison food (ie, approximately 16 g of Multi Grain Cheerios; General Mills, Minneapolis, MN) using a transportable scale before and after snack presentation on days 1, 2, and 7. The nutrient composition of bell peppers and Multi Grain Cheerios was as follows: 18 kcal, 0.2 g fat, 3 mg sodium, 4.3 g carbohydrates, 2.2 g sugar, and 0.8 g protein; and 54 kcal, 0.6 g fat, 58mg sodium, 11.8 g carbohydrates, 3.1 g sugar, and 1.2 g protein, respectively.[8]

On days 2 and 7, food items were presented for 7.5 minutes without the concurrent video presentation. At the end of each visit, children were allowed to select a sticker as a token of appreciation. Researchers did not inform parents regarding which foods were presented to the children.

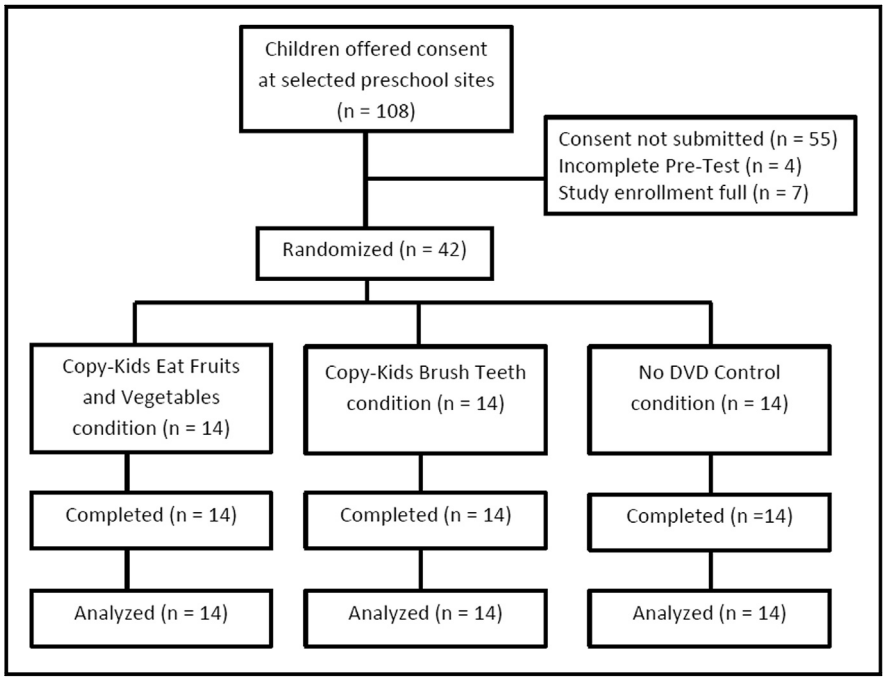

Figure 1. CONSORT diagram of study enrollment.

DVD Stimuli

The *Copy-Kids* DVD series (Santa Monica, CA) is commercially available and designed to encourage positive eating habits in young children (aged 6 months to 5 years). The *Copy-Kids Eat Fruits and Vegetables* DVD contains individual segments for 6 vegetables and 6 fruits. The bell pepper segment features individual clips of 5 similarly aged toddlers (80% aged 3–4 years; 60% female; 40% non-white) happily eating and vocally interacting with the food item (eg, "bell peppers" stated 4 times; creatively playing with bell peppers by building a roller coaster out of slices). The *Copy-Kids Brush Teeth* DVD was produced by the same company and features 8 children of similar ages (88% aged 3–4 years; 50% female; 37% non-white) modeling tooth brushing. Both segments were spliced to be 7.5 minutes in duration. The DVD was displayed on a Dell Latitude E6540 laptop with a 15-in screen (Dell Inc., Round Rock, TX). The sound level and laptop distance from the child were standardized within each school.

Measurements

The parent pre- and postsurvey collected: (1) child demographic information; and (2) dietary habits and purchasing trends, including the child's usual appetite (measured on a scale from 1 to 4, in which 1 = excellent and 4 = poor), current dietary habits (On an average day, how many cups of fruits does your child eat?), and home availability (ie, How many fruits and vegetables are available in the home?).[9] Parents selected fruits and vegetables consumed by their children on a regular basis, eaten in the past week, mentioned or requested in the past week, and purchased or available in the home during the past week, from a 12-item list of various fruits and vegetables (including bell pepper, the food featured in the 7.5-minute *Copy-Kids* DVD stimulus). A handout was provided with examples of fruits and vegetables apportioned into 1 cup to aid parents.[10] Finally, media