

# Testing the Effectiveness of In-Home Behavioral Economics Strategies to Increase Vegetable Intake, Liking, and Variety Among Children Residing in Households That Receive Food Assistance

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## ABSTRACT

**Objective:** To test the effectiveness of behavioral economics strategies for increasing vegetable intake, variety, and liking among children residing in homes receiving food assistance.

**Design:** A randomized controlled trial with data collected at baseline, once weekly for 6 weeks, and at study conclusion.

**Setting:** Family homes.

**Participants:** Families with a child (9–12 years) will be recruited through community organizations and randomly assigned to an intervention (n = 36) or control (n = 10) group.

**Intervention:** The intervention group will incorporate a new behavioral economics strategy during home dinner meal occasions each week for 6 weeks. Strategies are simple and low-cost.

**Main Outcome Measure(s):** The primary dependent variable will be child's dinner meal vegetable consumption based on weekly reports by caregivers. Fixed independent variables will include the strategy and week of strategy implementation. Secondary dependent variables will include vegetable liking and variety of vegetables consumed based on data collected at baseline and study conclusion.

**Analysis:** Mean vegetable intake for each strategy across families will be compared using a mixed-model analysis of variance with a random effect for child. In additionally, overall mean changes in vegetable consumption, variety, and liking will be compared between intervention and control groups.

**Key Words:** vegetable, behavioral economics, low-income, children, protocol (*J Nutr Educ Behav.* 2015;47:e1-e9.)

Accepted December 18, 2014.

## INTRODUCTION

Childhood obesity remains a significant public health concern in the US, especially among populations with low socioeconomic status.<sup>1,2</sup> Although the direct relationship between vegetable intake and weight

status among children remains unclear, replacing high energy-dense foods with vegetables has the potential to lower dietary energy intake, thereby reducing the risk of obesity.<sup>3</sup> According to National Health and Nutrition Examination Survey (NHANES) data (2007–2008), approxi-

mately 95% of children aged of 9–13 years do not meet the dietary recommendation for total daily vegetable intake.<sup>4</sup> To address this concern, the National School Lunch Program provides nutritious meals, including vegetable choices, to low-income children at a free or reduced cost.<sup>5</sup> Although programs such as the National School Lunch Program address the issue of availability in schools, additional efforts are necessary to encourage vegetable selection and consumption among children at home.

The relatively new field of behavioral economics is proposed as a means to improve dietary behavior based on the effectiveness of small, environmental changes known as nudges to alter choice behavior.<sup>6</sup> Nudges are made by someone with control over the choice environment,

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*Conflict of Interest Disclosure:* The authors' conflict of interest disclosures can be found online with this article on [www.jneb.org](http://www.jneb.org).

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<http://dx.doi.org/10.1016/j.jneb.2014.12.006>

but not in a way that imposes objectionable restrictions. They guide the consumer into making particular choices (eg, healthier foods), often without the consumer noticing. Nudges work best when they address behaviors based on quick, automatic decisions that may represent a departure from a strictly rational model of beliefs, preferences, and decision making. Behavioral economics strategies have strong appeal because they are potentially easy to implement and inexpensive, and influence desired choices. Nudges have been successfully applied to change food choice and intake among children in school cafeterias, but these strategies have been explored less often in the home setting.<sup>7</sup> Children consume

about two-thirds of their daily calories from foods prepared in the home<sup>8</sup>; therefore, using behavioral economics strategies at home has the potential to affect overall vegetable intake.

The purpose of the current study is to test the effectiveness of 9 behavioral economics strategies or nudges (Table 1) for improving vegetable intake, liking, and variety of vegetables consumed by children (aged 9–12 years) during dinner. Researchers will use the socioecological model as a framework for addressing eating behavior based on how individual, social, physical, and macro-level environments influence food choices.<sup>9</sup> Caregivers will implement the behavioral strategies or nudges to improve the food choice set for chil-

dren by manipulating the home physical and/or social environment (Table 1). The goal of the study is to select 6 of these 9 strategies for incorporation into future Cooking Matters for Families courses conducted in the Minneapolis/Saint Paul area. Cooking Matters for Families is a program implemented in many states in the US in which parents and children learn to prepare food together.<sup>10</sup>

## METHODS

### Participants

Researchers will recruit caregivers of at least 1 child (aged 9–12 years) and the 9- to 12-year-old child through local agencies and organizations such as

**Table 1.** Behavioral Economics Strategies Tested for Effectiveness

Strategy/Example	Rationale
Pair vegetables with other foods the child already likes. For example, add beans (less liked) to tacos (liked).	Associative conditioning (flavor–flavor learning) has promoted vegetable intake among middle school children. <sup>27</sup>
Make vegetables more easily available and visible than other foods at the dinner meal. For example, place the vegetable serving dish on the dinner table and keep other foods in another room and/or out of sight.	Increasing the prominence and convenience of certain foods while decreasing the accessibility and convenience of other foods has resulted in changes in intake of each food. <sup>28</sup>
Serve vegetables before the rest of the meal. For example, serve vegetables while dinner is being prepared.	Removing competition with other foods or decreasing non-fruit or vegetable options improved fruit intake among preschool children. <sup>29</sup>
Use a dinner plate that shows the amount of vegetables to eat for a meal. Use paper plates provided for all family members for 3 meals with sections printed according to MyPlate (MyPlate Paper Portion Plate, Positive Promotions, 15 Gilpin Ave, Hauppauge, NY).	Use of assortment allocation cues (pictures in school lunch tray compartments) has improved selection and consumption of vegetables among school-aged children. <sup>30</sup>
Offer the child 2 vegetable options for dinner, 1 liked and 1 less liked. Then let the child choose what is served.	Contrasting a liked option against the competition of a less liked option (asymmetric dominance) has resulted in changes in consumer decision making. <sup>31</sup>
If the caregiver puts vegetables on the child's plate, give more than usual. If children typically serve themselves, put a larger spoon than normally used with the vegetable so they get more than usual.	Using a larger serving spoon makes the default option a larger serving and has increased ice cream intake among nutrition experts. <sup>32</sup>
Eat dinner together with an adult(s) modeling vegetable consumption.	Decision making may be influenced by parental social (descriptive) norms representing a departure from the assumption of rationality. Associations have been established between parental normative influence and vegetable intake of children. <sup>33</sup>
Serve at least 2 vegetables with dinner meals. Include 2 different vegetables as side dishes OR 1 side dish of vegetables plus another food item with vegetables.	Increasing variety of vegetables offered has increased selection and consumption among children. <sup>34,35</sup>
Let the child help prepare vegetable dishes. For example, ask the child to get vegetables out and wash them.	Individuals have liked and preferred products they made themselves over those made by others. The mere act of preparing a certain food enhanced liking and consumption among adults. <sup>36</sup>

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