

Positive Effects of Peer Modeling and Positive Reinforcement on Healthy Food Intake in

Elementary School Children

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Abstract

The current study aims to discover the effects of “Food Dudes” peer modeling videos and positive reinforcement on vegetable consumption using a delayed multiple baseline design across subjects. Results suggest peer modeling and positive reinforcement as effective means to increase vegetable intake.

DESCRIPTORS: healthy food intake, peer modeling, positive reinforcement

The Effect of Peer Modeling and Positive Reinforcement of Vegetable Intake

Healthy eating behaviors are currently being stressed among youth of today because of the ever growing rate of chronic illnesses that are attributed to unhealthy lifestyles, including unhealthy eating behaviors. For this reason it is important to reinforce healthy eating behaviors and healthy lifestyle behaviors among our youth in order to have healthy future generations.

The current study aims to address the lack of healthy eating behaviors among youth by examining the effect of peer modeling videos and positive reinforcement on healthy eating behaviors in children. More importantly, the present study intends to differentiate the effectiveness of peer modeling videos from positive reinforcement of healthy eating behaviors. With that being said, the researchers predict that the “Food Dudes” peer modeling videos will slightly increase vegetable eating behaviors, but positive reinforcement will cause a greater increase in vegetable eating behaviors.

Considering the current importance of promoting healthy lifestyles, several studies have examined methods that may help increase healthy eating behaviors among youths. Related to this study there has been considerable research on the effects of peer modeling and positive reinforcement on healthy eating behaviors.

One interesting study looked at adolescents’ self-efficacy for healthy eating and peer support for healthy and unhealthy eating behaviors (Fitzgerald, Heary, Kelly, Nixon, & Shevlin, 2013). The study consisted of a large sample ($N=483$) of adolescents in Ireland, aged 13 to 18 years. Results indicated that peer support of unhealthy eating behaviors was associated with unhealthy food intake (Fitzgerald et al., 2013). This study demonstrates the connection between peers and an individual’s eating habits.

Another study with a large sample ($N=116$) examined whether a peer’s vegetable intake would predict the vegetable intake of the participant (Hermans, Larsen, Herman, & Engels, 2009). Contrary to the previous study that found a connection between peer’s support for unhealthy eating and participant’s unhealthy eating behaviors, this study found that the participant consumed more vegetables when they were exposed to a peer eating a large amount of vegetables than when they were exposed to a peer eating little or no vegetables (Hermans et al., 2009). This study supports the connection between peer’s vegetable intake and participant vegetable intake, and the effectiveness of peer modeling of vegetable intake.

Additionally, a study conducted by Granner and Evans (2012) examined the effects of parent modeling as well as peer modeling on the fruit and vegetable intake of a large sample ($N=843$) of adolescents (ages 11 to 15 years). Parent and Peer modeling were significantly correlated with both fruit and vegetable intake (Granner & Evans, 2012). The results of this study suggested that both parent and peer modeling were effective methods to improve vegetable intake in the adolescent sample.

Similar to the present study, Lowe and Horne (2009) examined the effectiveness of the food dudes program to increase children’s fruit and vegetable consumption. Results showed that the “Food Dudes” program increased children’s, aged four to 11 years, fruit and vegetable consumption through the use of role modeling, rewards, and repeated tasting (Lowe & Horne, 2009). This study supports the idea that peer modeling and the positive reinforcement of fruit and vegetable intake increases children’s fruit and vegetable consumption.

Method

Participants

Three participants from a kindergarten through eighth grade (K-8) charter school in southern Florida partook in the current study. The first participant was a seven year old African American male in the second grade with no known food allergies. He reported that his favorite food was macaroni and cheese, and his least favorite food was popcorn. Participant one mentioned that his favorite vegetable was carrots, and his least favorite vegetable was broccoli. When asked how he felt about eating vegetables he stated, "It's alright."

The second participant was a five year old African American male in kindergarten with no known food allergies. He reported that his favorite food was chicken, and his least favorite food was apples. Participant two indicated that his favorite vegetables were red bell peppers and tomatoes, and his least favorite vegetable was Brussels sprouts. When asked how he felt about eating vegetables he said, "It's okay."

Lastly, the third participant involved in the current study was a seven year old African American female in the second grade with no known food allergies. She reported that her favorite food was pizza, and her least favorite foods were celery and peanut butter. Participant two mentioned that her favorite vegetable was carrots, and her least favorite vegetables were potatoes and celery. When asked about how she felt about eating vegetables she indicated that she enjoys eating certain vegetables.

Setting and Materials

The present study took place in a K-8 charter school in southern Florida. Sessions were conducted during an aftercare program and were held in a storage room on the first floor of the elementary building. The storage room was approximately seven feet by 15 feet in area. A door to the outside was positioned behind the experimenter and a hallway with classrooms was positioned behind the participant.

About a half pound of rinsed raw snow peas on a black Styrofoam tray were used during every session. In addition, an iPhone mounted by a tripod was used to record every session for interobserver agreement. The first intervention used downloadable "Food Dudes" clips via the internet and a laptop. The second intervention used reinforcers including pencils (traditional and mechanical), stickers, stackable crayons, magic towels, toy cars, coloring kits, card decks, and erasers. The mentioned reinforcers were selected because of a functional assessment consisting of parent interviews, teacher interviews, and participant interviews that indicated that the selected objects would be reinforcing to vegetable consumption behavior.

Experimental Design and Variables

A *delayed multiple baseline design across participants* was used for the current study. The first independent variable was implementation of the "Food Dudes" clips, which consisted of peer modeling aspects. The second independent variable was positive reinforcement of vegetable intake behavior. The dependent variable throughout the study was vegetable intake measured by per piece eaten.

Procedure

Baseline.

The experimenter took one participant out of the aftercare classroom and walked him or her to the research setting. Once both the participant and the experimenter were seated the

experimenter set up the camera and tripod. Next, the researcher took out the raw snow peas and placed them in front of the participant and in the view of the camera. The researcher then indicated to the participant that they may start tasting and recorded for two minutes. When two minutes passed the researcher indicated to the participant that they were finished while ending the recording and putting away the raw snow peas. Once the first participant's behavior achieved a stable baseline, the researcher started the baseline procedure with the second participant. Lastly, when the second participant's behavior reached stability in baseline, the researcher began the baseline procedure with the third participant.

Intervention one (peer modeling videos).

Again, the researcher took one participant out of the aftercare classroom and walked him or her to the experimentation setting. Once the experimenter and participant were both seated the experimenter set up the camera, tripod, and laptop. Then, the experimenter opened the file of "Food Dudes" video clips and played two minutes of the clips as the participant watched. After the "Food Dudes" video clips concluded, the experimenter took out the tray of raw snow peas, placed the tray in front of the participant, and indicated that the participant could start tasting. Once the participant had the opportunity to taste for two minutes the researcher indicated that they were finished while ending the recording and putting away the snow peas. Once the first participant's behavior achieved stability during the intervention phase, the researcher started the baseline procedure with the second participant. Lastly, when the second participant's behavior reached stability in the intervention phase, the researcher began the intervention procedure with the third participant.

Intervention two (positive reinforcement).

As in the baseline phase and first intervention phase, the researcher took one participant out of the aftercare classroom and walked him or her to the experimentation setting. Once the researcher and participant were both seated the researcher set up the camera and tripod for recording. Next, the researcher took out the tray of snow peas and placed them in front of the participant. The researcher then began recording and indicated that the participant may start tasting. As the participant finished one snow pea he or she was presented with a reinforcer. Once two minutes concluded the researcher indicated they were finished, ended the recording and put away the snow peas. Once the first participant's behavior achieved stability during the intervention phase, the researcher started the baseline procedure with the second participant. Lastly, when the second participant's behavior reached stability in the intervention phase, the researcher began the intervention procedure with the third participant.

Interobserver Agreement.

Interobserver agreement was calculated by having a separate party review a random sample of 11 sessions out of the total 36 sessions (about 30%). The interobserver agreement on the number of snow peas consumed by each participant during the observation sessions of the current study was 100%.

Results

The visual analysis of data has proven sufficient in single subject methodology (Richards, Taylor, & Ramasamy, 2014). The visual analysis of the data from the current study suggests that the "Food Dudes" videos, which implemented the use of peer modeling, slightly increased participants' vegetable consumption. Additionally, a visual analysis of the data shows that positive reinforcement of participants' vegetable consumption has a significant effect on increasing participants' vegetable consumption than the peer modeling videos alone.

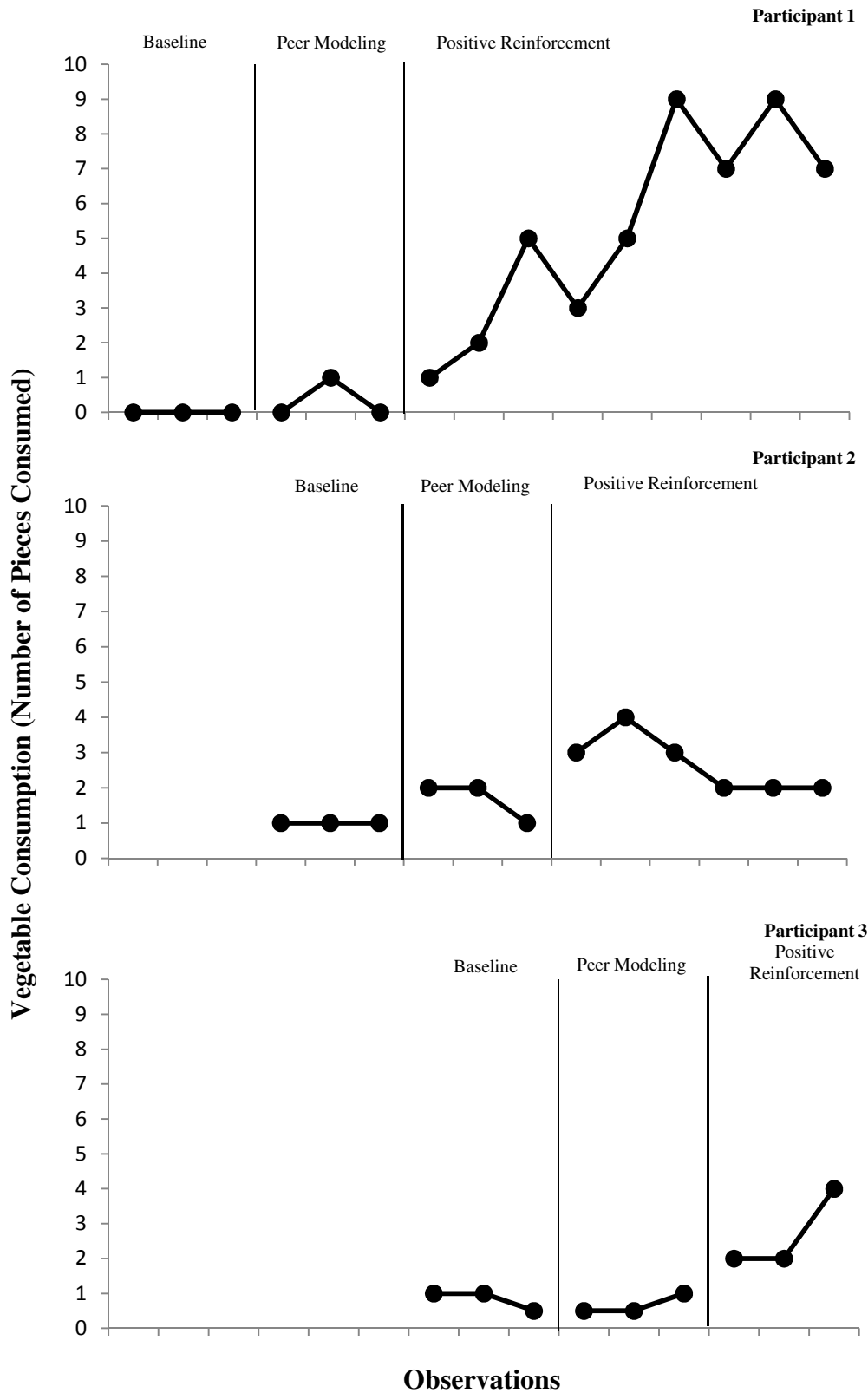


Figure 1. Using a *delayed multiple baseline across participants*, data displays the number of vegetable pieces consumed across baseline, intervention one (peer modeling videos), and intervention two (positive reinforcement).

Discussion

The current research shows and differentiates the effectiveness of peer modeling videos and positive reinforcement on increasing participants' vegetable consumption in the single subject research *delayed multiple baseline across participants* design. The current research supported the hypothesis that peer modeling videos slightly increased participants' vegetable consumption, and positive reinforcement of participants' vegetable consumption resulted in an even greater increase in the target behavior.

The findings of the current research are useful and beneficial to the ongoing effort to help improve the diets of younger generations. On February 9, 2010, First Lady Michelle Obama launched her campaign, *Let's Move!*, to improve the health of the nation's youth (Office of the First Lady, 2013). First Lady Michelle Obama's initiative focuses on providing real support to families and young people to live healthier lives (Office of the First Lady, 2013). The support created by the *Let's Move!* campaign includes increased access to health information for families, improved meals provided by schools, increased availability of healthy affordable foods, and increased opportunities for physical activity in different communities (Office of the First Lady, 2013). Evidently, the United States of America is taking great measures to ensure that the nation's youth is living to their full potential through improving their overall physical health. As outlined by the *Let's Move!* campaign focusing on improving children's diets, as the current study has done, is a central part to improve their overall health.

One limitation of the study is that the study did not have sufficient resources to conduct a follow up phase, to determine the maintenance of participants' vegetable intake without the use of either intervention. It is recommended that the current research be replicated with more demographically diverse participants, in order to further display the effectiveness of peer modeling and positive reinforcement of vegetable intake on increasing vegetable intake. It is also recommended that more research be conducted investigating the maintenance of healthy food intake during a follow up phase of study.

References

- Fitzgerald, A., Heary, C., Kelly, C., Nixon, E., & Shevlin, M. (2013). Self-efficacy for healthy eating and peer support for unhealthy eating are associated with adolescents' food intake patterns. *Appetite, 63*, 48-58. doi: 10.1016/j.appet.2012.12.011
- Granner, M. L., Evans, A. E. (2012). Measurement properties of psychosocial and environmental measures associated with fruit and vegetable intake among middle school adolescents. *Journal of Nutrition Education and Behavior, 44*, 2-11. doi: 10.1016/j.nbe.2011.03.031
- Hermans, R. C. J., Larsen, J. K., Herman, C. P., & Engels, R. C. M. E. (2009). Effects of social modeling on young women's nutrient-dense food intake. *Appetite, 53*, 135-138. doi:10.1016/j.appet.2009.05.004
- Lowe, C. F. & Horne, P. J. (2009). Food Dudes: Increasing childrens' fruit and vegetable consumption. *Cases in Public Health Communication & Marketing, 3*, 61-185.
- Office of the First Lady. (2013 February 27). *First lady Michelle Obama to embark on national tour celebrating third anniversary of let's move*. Retrieved from <http://www.whitehouse.gov/the-press-office/2013/02/20/first-lady-michelle-obama-embark-national-tour-celebrating-third-anniver>
- Richards, S. B., Taylor, R. L., & Ramasamy, R. (2014). *Single subject research: Applications in educational and clinical settings*. Belmont, CA: Wadsworth.