



Copycat snacks: Can students differentiate between school and store snacks?



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ABSTRACT

In 2014, the national *Smart Snacks in School* nutrition standards placed regulations on all snack foods sold in schools. Many food companies reformulated common snack food products for sale in schools, called “copycat snacks”, which look similar to nutritionally different foods sold in stores. It is possible that these snacks create consumer confusion among students. The purpose of this study was to determine if middle school students could differentiate, in taste and appearance, between school (copycat) and store versions of common snacks. Seventy-six middle school students evaluated three different food products offered in schools: Froot Loops, Rice Krispy Treats, and Doritos. Students tasted snacks in a series of triangle tests for difference, one for each snack food, including school and store versions. Students were also presented with packages, school and store versions of the same products, and asked to determine the expected taste, purchase intentions, and perceived healthfulness. Students could determine taste differences between school and store Rice Krispy Treats yet could not differentiate between Froot Loop and Dorito varieties. Students rated store versions of all three snacks with greater expected taste, higher intention to purchase, and as less healthy. While it seems product confusion concerning copycat snacks may not be severe in this sample, snack food brands are still a prominent feature in schools. It is possible that these copycat snacks can confuse students' perceptions of healthy foods. Alternative packaging for school foods or reformation of store versions of snack foods may be viable solutions to this problem.

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1. Introduction

In United States public schools, the intention of the National School Lunch and Breakfast Programs are to provide access to affordable and nutritious meals to encourage learning (US Department of Agriculture, 2013a, 2013b). Over 31 million students participate in the National School Lunch Program (NSLP) daily, and the potential impact through policy change could affect a large population (US Department of Agriculture, 2013c). Legislation established by the Healthy Hunger-Free Kids Act of 2010 has tightened nutrition standards in all public schools participating in the NSLP. In addition to new nutrition standards for breakfast and lunch, the Healthy-Hunger Free Kids Act 2010 included the creation of nutrition standards for all competitive foods. Competitive foods include foods sold in vending machines, school stores, for fund-raising efforts, and *à la carte* items, which are foods sold in the cafeteria outside of school meal programs (US Department of

Agriculture, 2013a). In July 2014, the *Smart Snacks in School* nutrition standards became effective. These standards were designed to help meet the goals set by Healthy People 2020 including an increase in the number of schools offering nutritious foods and beverages outside of school meals and increasing the number of districts requiring fruits and vegetables to be sold (US Department of Health and Human Services, 2010). Standards include calorie, saturated fat, total fat, sugar, and sodium restrictions for snack foods. In addition to these, foods must also meet one of the ingredient requirements: contain 50% or more whole grains by weight or have whole grains as the first ingredient (second if first is water), have a non-grain main food group as the first ingredient (fruit, vegetable, dairy, protein), or be a combination food with ¼ cup fruit or vegetable (US Department of Agriculture, 2013a). The proposal of these new standards showed promising changes that could occur after implementation of snack standards (US Department of Agriculture, 2015a, 2015b).

In response to the standards food companies were quick to reformulate products to maintain their sales market to students (Wilking, 2014). These new reformulated snacks, called “copycat

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snacks”, comply with the *Smart Snacks* guidelines but are not widely offered outside of schools. However, nearly identical yet less nutritious items are available for purchase in local stores, vending machines, and groceries which may create consumer confusion among parents and students (Harris, Hyary, & Schwartz, 2016). These foods are markedly different than foods sold before the implementation of the standards as they are nearly identical to foods outside of schools yet have different formulations. Reduced fat versions of snack chips, for instance, are sold outside of schools, though not using the same packaging nor package sizes as those inside school walls.

Furthermore, new school wellness policy requirements have been set in place which will take effect June 30, 2017 (US Department of Agriculture, 2010). Under these new requirements, schools must include policies that permit only marketing of foods and beverages consistent with the *Smart Snacks* standards. Even with the standards, this would allow for the marketing of brands often called “junk” foods, such as Doritos, Cheetos, Rice Krispy Treats and Froot Loops, among others (Harris et al., 2015, 2016). While these reformulated foods do technically meet the standards set forth by the United States Department of Agriculture, the overall health habits of the 50.04 million children attending these public schools are affected by these policies (Kena et al., 2016). Food companies are still selling foods often referred to as “junk” foods (snack chips, gummy candy, cereal) in schools that comply with the *Smart Snacks* standards.

While the potential for consumer confusion among parents and older children has been explored (Harris et al., 2016), there remains the quandary if students could actually distinguish between the school copycat snacks and matching store versions both in packaging and in taste. If students are unable to detect a difference in products by taste, it may be possible to reformulate all snacks sold. If they can detect a difference, it may be in the best interest of food manufacturers to create notably different packaging for foods sold in schools.

The overall project goal was to determine if middle school age children could distinguish, in both package and taste, between select copycat snacks (Froot Loops, Rice Krispy Treats, and Doritos) and their matching store versions. Unlike previous studies, students were able to complete the survey independent of their caregivers and were able to examine the packages in person (Harris et al., 2016). The project hypotheses were that students would not be able to discern between copycat snacks and store versions in both taste and packaging.

2. Methods

2.1. Participants

Students in a private southern United States middle school, including grades 6–8, in physical education class were recruited to participate. Students enrolled in physical education courses during the fall semester participated in the study, accounting for 21% of the middle school. Middle school students were targeted because middle schools are often the first time students are transitioning into making independent food choices on a regular basis: there is often more autonomy in public middle schools compared to elementary schools for snack selection, on average 66.2% of schools allowed students to purchase snack foods or beverages in 2014 (Demissie et al., 2015). However, private school students were selected for this study as they have not been exposed to snacks standards, nor copycat snacks. These students will not be familiar with the copycat snack packages and would not be able to identify them as those permitted under the standards. Foods sold to students in this study are the same foods available in a local grocery

store. Demographic information (age, ethnicity, gender) as well as sensory and package responses were collected via RedJade (RedJade[®] Sensory Software Suite, 2016). Participation was voluntary and parental consent was obtained prior to the study. The University of Mississippi Institutional Review Board approved study instruments and protocol.

2.2. Sensory

Participants evaluated three food items commonly sold in schools: Doritos, Rice Krispy Treats, and Froot Loops (Harris et al., 2015). Sensory triangle tests for difference were used to determine if samples were perceptibly different between school and matching store snacks and has been used in children (Garcia, Ennis, & Prinyawiwatkul, 2012; Meilgaard, Carr, & Civille, 2016). Participants were presented three sets of samples, one of each snack type. In each set, there were two like samples and one different sample. Participants were asked to taste each sample and identify which sample was different from the other two, taking bites of crackers and sips of water between samples (Ross, Hinken, & Weller, 2007). If participants correctly detected the difference, the survey software provided a prompt to elaborate. Each set of samples was presented in the following order: Froot Loops, Rice Krispy Treats, and Doritos. Participants were given school and store versions in each snack set in balanced arrangements, each labeled with 4-digit codes, generated by RedJade. Students entered their samples into RedJade on computers to verify order of sampling.

2.3. Package evaluations

Participants were asked to evaluate six product packages. The products included both school and store versions of Doritos, Rice Krispy Treats, and Froot Loops. Each student completed evaluations in a balanced order. Packages were coded with numbers and were not identified to participants as school or store versions. Participants rated each snack on perceived nutritional value (“It is healthy” 1–9), expected taste (“I would like the taste” 1–9) and intention to purchase (“I would buy it” 1–9) using a survey in RedJade modified from previous research (Harris et al., 2016).

2.4. Statistical analysis

Paired t-tests were used to evaluate package differences between store and school versions of the snack foods. The triangle test, an overall difference sensory test, was used to determine if the school samples differed from the store samples. Statistical parameters for the triangle test were $\alpha = 0.05$, $\beta = 0.05$, and a proportion of discriminators (p_d) of 30%. Chi-square analysis was used to determine the number of correct observations needed to declare a difference between the two samples: store and school snacks. Based on these parameters, 34 correct observations of 76 total participants would be required. Responses to package comparisons were analyzed based on triangle test response using independent-samples t-tests.

3. Results

Seventy-six private school students participated in the study, mean age of 12.6 (range 11–14). Forty-eight (63%) were male. Students self-classified as Caucasian (77%), African-American (12%), American Indian or Alaskan Native (4%), Other (4%), and two students preferred not to answer (2%). The nearest public middle school had approximately 90% Caucasian students, 6% African-American students, 1% American Indian and 3% Hispanic students in 2016 (TN Department of Education, 2016).

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