Short Research Article

Is the Suppression Effect of the Color Red on Snack Food Consumption Reliable?

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Abstract. Two articles hypothesized that exposure to the color red would induce a state of avoidance motivation and reported that snack food consumption was decreased when the food was served on red plates, relative to white and blue plates. The current experiment combined their procedures and approximately tripled their group sizes. Participants were provided with pretzels on red, white, or blue plates in a mock sensory analysis task. The results indicated that more pretzels were consumed when presented on red plates, in direct contradiction of previous results. Alternative explanations, such as group differences in hunger or preference for pretzels, could not account for the results. The facilitation effect of red indicates that the color red does not always reduce snack food consumption and suggests that the reported inhibitory effect of red on snack consumption may not be reliable.

Keywords: color, red, avoidance motivation, snack consumption, replication

The prevalence of obesity in the United States continues to exceed 30% in most age and ethnic groups (Flegal et al., 2010; Ogden et al., 2014). There is widespread concern over this phenomenon because of the projected health and economic burdens associated with obesity (Wang et al., 2011). The consumption of snack foods has increased in both frequency and energy density of items over the same general time period (Piernas & Popkin, 2010). There is evidence that a variety of environmental factors will produce an increase in snack food consumption. Some factors are obviously related to consumption, like the effect of changes in portion sizes of snacks (Marchiori et al., 2011; Rolls et al., 2004, 2006). Other factors may be more subtle.

One subtle factor may be the color of the container. Genschow et al. (2012) and Bruno et al. (2013) have reported that the color red will reduce snack food consumption. Rohr et al. (2015) reported that a red color surround facilitated avoidance of drawings on unhealthy food. All reports cite the work of Elliot et al. (2007) and Mehta and Zhu (2009) as the basis for their experiments. Elliot and Maier (2012) summarized their work on the influence of red as *color-in-context* theory. Elliot et al. (2007) distinguished between the influence of red in achievement contexts and affiliation contexts. An achievement context is a situation in which competence is evaluated, and red carries the meaning of danger. Red impairs performance in achievement contexts. Elliot et al. (2007) reported that a brief exposure to the color red impaired anagram solutions, relative to green and black. But the influence of red is different in affiliation contexts involving heterosexual interaction. Here, red suggests romance. Elliot and Nestia (2008) reported that men rated photographs of women as being more attractive when the photograph was framed by a red border. Elliot et al. (2010) found that women rated men as more attractive when the male appeared on a red background.

Mehta and Zhu (2009) assumed that red always activates a state of avoidance motivation but that the effect on performance depends on the context. In contrast to Elliot et al. (2007), Mehta and Zhu (2009) reported that anagram solutions were facilitated if the anagrams involved words consistent with an avoidance interpretation. In another experiment, proofreading (an achievement context) was improved by the presence of red.

Genschow et al. (2012) hypothesized that exposure to red should trigger an unobtrusive *stop* reaction that would reduce snack food consumption based on their reading of Elliot et al. (2007) and Mehta and Zhu (2009). The first study in Genschow et al. (2012) recruited participants to evaluate three different soft drinks. The drinks were labeled with stickers, and the background color of the sticker was either red or blue for all three cups. The results for all

three beverages were that consumption from cups with the red stickers was less than cups with blue stickers. A problem with the first study is that it lacked a control condition. Red may have decreased consumption or blue may have increased consumption. The second study investigated consumption of pretzels on red, white, or blue plates. The study took place at a university information fair. Visitors were invited to respond to questionnaires. If they agreed to do so, then they were seated at a table with a red, white, or blue plate containing 10 pretzels. Visitors were invited to snack while filling out the questionnaires. Genschow et al. (2012) reported that approximately 1.5 fewer pretzels were eaten from the red plates relative to both the blue (d = 0.52) and white (d = 0.50) plates. Unfortunately, 21 of the 130 participants (16%) had to be excluded because they shared pretzels with other people.

Bruno et al. (2013) investigated the red avoidance-motivation effect in three experiments. Independent groups of participants were presented with popcorn (N = 90), chocolate chips (N = 75), or moisturizing cream (N = 75) on red, white, or blue plates and asked to evaluate the product in a between-subject mock sensory analysis task. Bruno et al. (2013) reported that consumption of popcorn and chocolate chips and the use of cream were reduced when the items appeared on red plates. Chocolate chip consumption on red plates was reduced relative to both white (d = 0.45) and blue (d = 0.90) plates. Popcorn consumption on red plates was reduced relative to both white (d = 0.67) and blue (d = 0.51) plates.

Both Genschow et al. (2012) and Bruno et al. (2013) suggested that the color red could be used as a subtle environmental cue to reduce snack food consumption. Use of red as an environmental signal to stop eating would be easy to implement over a variety of situations and suggests important practical consequences for the effect. First, however, the result needs to be replicated to ensure that the effect is reliable. The importance of the issue of replication of published results has been addressed from several perspectives (e.g., the set of articles edited by Pashler & Wagenmakers, 2012).

The purpose of this experiment was to investigate whether exposure to the color red would reduce snack food consumption. The procedure was modeled after the study of Genschow et al. (2012) and Bruno et al. (2013). Participants were presented with pretzels, as in the report of Genschow et al. (2012), under the guise of a sensory analysis task, as in the report of Bruno et al. (2013). The color of the plates (red, white, or blue) was manipulated across participants, as in both prior studies. All effect sizes for contrasts involving red versus a control color were of medium size, at least, in both studies. G*power (Faul et al., 2007) was used to identify the minimum number of participants per group to find a medium size effect with a statistical power of 90%. The primary question was whether participants in the red-plate group ate fewer pretzels than the white- or blue-plate group.

Method

Participants

A total of 269 undergraduate students (175 women, 94 men) participated in the experiment for course credit. Their M_{age} was 19.6 years (SD = 1.5 years). No participants were excluded from the study. Post hoc analysis showed that statistical power was 95% with this number of participants. The study was approved by the Appalachian State University Institutional Review Board.

Materials

Frito Lay Rold Gold Tiny Twist and Frito Lay Rold Gold Stick pretzels were used. The 23-cm diameter red, white, and blue plastic plates were obtained from a local grocery store. A 150-mL clear cup provided water to drink during the session.

Procedure

Participants were randomly assigned to a color condition and were told that they would be comparing two types of pretzels along several dimensions in a taste comparison task. Participants entered the experimental room and were shown two plates, each covered with a paper napkin. The napkin on the left was labeled *A*, and the napkin on the right was labeled *B*. The questionnaire was placed between the plates, slightly closer to the participant, and a small cup of water was placed on the opposite side of the questionnaire.

Both plates were of the same color (red, white, or blue), and each contained either 10 whole twist pretzels or 10 whole stick pretzels. The two pretzel shapes were used to enhance the face validity that a comparison was to be made. Location of the twist and stick pretzels was counterbalanced across participants.

Two plates from each color group were analyzed with an (X-Rite, Ic., Grand Rapids, MI, USA) spectrophotometer to obtain objective measures of color. Table 1 presents the values of each of the two plates in CIE L*a*b* (CIELAB) color space notation. The L* dimension is a measure of lightness, a* defines the location on a chromatic red-green

Table 1. CIE L*a*b* colorimetric coordinates for two red, white, and blue plates

Color	L*	a*	b*
Red	32.8	57.7	32.2
	32.6	57.6	32.5
White	89.0	−2.2	−4.7
	89.0	−2.0	−4.6
Blue	32.8	−3.5	−50.4
	32.6	−3.6	−50.5

Note. Spectrophotometer readings for representative red, white, and blue plates that were used in the experiment. The L* dimension is a measure of lightness, a* defines the location along a chromatic red-green plane, and b* defines the location along a chromatic yellow-blue plane.

plane, and b* defines the location on a chromatic yellow-blue plane. Table 1 shows that the red and blue plates had equal lightness. Color measures of the pretzels are not reported because pretzels are variegated in color.

The front page of the questionnaire was titled *Pretzel Taste Study*. Participants answered two measures concerning their hunger state. A subjective measure asked them to rate their hunger at that moment on a 1 (*not hungry*) to 9 (*extremely hungry*) scale. The midpoint (5) was labeled *moderately hungry*. An objective measure asked participants to indicate the amount of time in minutes since they had last eaten. Eating was defined as the consumption of any food or beverage, with the exception of water. The instructions were located immediately below the hunger measures and were as follows:

> This is an experiment on factors affecting your consumption of food. In front of you are two plates covered by napkins. After reading these instructions, you may uncover the plates and begin sampling pretzels from both of the plates, labeled *A* and *B*. Please form a stable impression of the characteristics of each set of pretzels as we will ask you to answer some questions comparing the two plates. Please continue sampling from both plates until you feel that you have developed a stable impression of the food on each plate. The cup of water is there for you to cleanse your palette while developing your impressions. Once you have formed a stable impression of the two, then cover each plate with the original napkin. Do not sample from the pretzels again after you have covered them with the napkins.
>
> After you have finished sampling the pretzels, then go to the next page.

The next page contained three blocks of letters and numbers. The participant was supposed to cross out and count the number of the letter P in the blocks. The purpose of this task was to suggest the participant that delays between tasting and evaluating tastes were also being examined.

The final page of the questionnaire asked the participants to indicate on an 11-point bipolar scale separating A and B which types of pretzels were the most salty, crunchy, flavorful, attractive, and most appealing in color. These questions were to enhance the face validity of the task, and their results were not analyzed. The last two questions asked the participants to rate how much they liked pretzels and how often they ate pretzels on a 9-point scale.

After the participant had left the room, the experimenter recorded the number of pretzels left on each plate. The experimenters were trained to count the pretzel as consumed, if most of the pretzel was eaten, to not count the pretzel as eaten if most of the pretzel was not eaten, or to use 0.5 to indicate that one-half of a pretzel remained. No data were excluded from the study. No other manipulations occurred and no other measures were recorded. Steele and Rash (2021) provide access to the experimental materials.

The results of Genschow et al. (2012) and Bruno et al. (2013) show that the total number of pretzels eaten should be decreased when they were presented on red plates because red should serve as a subtle signal to stop eating.

Results

Figure 1 shows the mean number of pretzels per person that were eaten during the experimental session. More pretzels were consumed when presented on red plates, in direct contradiction to the results reported by Genschow et al. (2012) and Bruno et al. (2013).

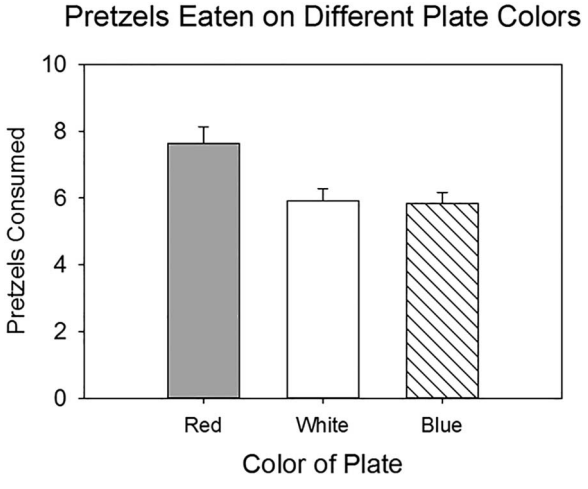

Figure 1. Effect of color on pretzel consumption. Mean number of pretzels eaten per person as a function of the color of the plate. Error bars indicate 1 *SE*.

An ANOVA showed a main effect of color, $F(2,266) = 6.28$, $p = .002$, $\eta^2 = .004$. Post hoc comparisons showed that more pretzels were consumed when presented on red versus white plates, $t(178) = 2.78$, $p = .006$, $d = 0.42$, and red versus blue plates, $t(177) = 2.98$, $p = .003$, $d = 0.45$. The number of pretzels eaten on blue versus white plates were not significantly different, $t(177) = 0.15$, $p = .88$, $d = 0.02$.

One alternative explanation to a facilitation effect of the red plates on pretzel consumption is that by chance the red-plate group was more hungry than the other groups. We performed two sets of analyses to test this possibility. The first set examined whether the groups differed in hunger at the start of the experiment. ANOVAs were performed for both the objective measure (time since eaten) and the subjective measure (self-rating of hunger). There was no difference among the groups prior to the start of the experiment for the objective measure, $F(2,266) = 0.63$, $p = .53$, or the subjective measure of hunger, $F(2,266) = 0.94$, $p = .39$).

A second set of analyses examined whether the effect of color would remain if differences in the amount of hunger across groups were statistically controlled using an analysis of covariance. The main effect of color was present when the objective measure of hunger was the covariate, $F(2,265) = 6.37$, $p = .002$, and when the subjective measure of hunger was the covariate, $F(2,265) = 5.95$, $p = .003$. Post hoc comparisons indicated that red plates still produced more consumption of pretzels for both ANCOVAs.

The final liking and consumption-frequency questions were analyzed to see if preexisting attitudes among the groups might explain the differences in pretzel consumption. There was no significant difference among the color groups for either liking pretzels, $F(2,266) = 1.37$, $p = .26$, or frequency of consumption of pretzels, $F(2,266) = 1.41$, $p = .25$.

Men ate more pretzels ($M = 7.57$, $SD = 4.68$) than women ($M = 5.87$, $SD = 3.29$), $t(267) = 3.46$, $p = .001$, $d = 0.44$. The distribution of sexes within groups was examined to see if the increased consumption could be explained as due to more men in the red-plate group. The pattern was the reverse. The red-plate group contained less men (21 men, 69 women) than either the blue (35 men, 54 women) or white (38 men, 52 women) group.

One observation of interest was that participants typically consumed each pretzel completely and ate the same number of each type of pretzel. The difference in number consumed between each type of pretzel per participant was small ($M = 0.23$, $SD = 1.4$) although 10 twist pretzels ($M = 15.9$ g, $SD = 0.64$) weighed approximately three times as much as 10 stick pretzels ($M = 5.2$ g, $SD = 0.48$).

Discussion

Genschow et al. (2012) and Bruno et al. (2013) reported reduced consumption of snack foods when the food was presented on red plates. The purpose of this experiment was to investigate whether we would replicate that result, thereby adding to the reliability of the reports. Our procedure was modeled after those studies. The snack food was pretzels, as used by Genschow et al. (2012), and was presented under the guise of a sensory analysis task, as used by Bruno et al. (2013). The procedure was a between-groups comparison, as used by both studies. Our sample size was 89 or 90 participants per group, approximately three times the number of participants per group compared to the other two studies, and the obtained statistical power of the present comparisons was greater than 95%.

The major result was that the presence of red increased pretzel consumption, in contradiction to the inhibitory results reported by Genschow et al. (2012) and Bruno et al. (2013). The amount of the increase was about 1.8 pretzels per person, a medium statistical effect size. Other results in the study support the main result as a valid effect. There were no systematic differences in hunger across the color groups that would explain the increased consumption in the red-plate group whether an objective measure of hunger (time since last eaten) or a subjective rating of hunger was used. Men ate more pretzels than women, a sex difference previously observed with the consumption of potato chips (Rolls et al., 2004, 2006). But men were not overrepresented in the red-plate group, and both sexes showed increased consumption of pretzels on red plates. Finally, participants ate equal amounts of stick and twist pretzels although the twists were three times heavier in weight, which is consistent with the literature showing a dissociation between consumption and caloric intake (Marchiori et al., 2011).

The current study combined the procedures of Genschow et al. (2012) and Bruno et al. (2013). Some might object that our results would have been more powerful if we had used the method of only one of the studies to produce a direct replication. The idea that one can literally copy the method of another study at will is wrong. There will be always differences among experiments. Many factors are never described in method sections. Schmidt (2009) made this point clearly when he introduced the distinction between direct and conceptual replications. Schmidt concluded that there were no clear-cut criteria to distinguish between the two types of replications. Instead, the question that needed to be asked prior to a replication is, whether the researchers knowingly introduce differences between the procedures that should be predicted to affect the results? We modeled our procedure after Bruno et al. (2013) because it produced

tighter control over participant behavior. The substitution of pretzels (as used successfully by Genschow et al., 2012) was chosen because pretzels have a longer shelf life than popcorn. We saw no differences in our method that would lead us to anticipate a reversal of the effect.

A related contradiction of results involving red has been reported in another research area. Guéguen and Jacob (2014) investigated the hypothesis of Elliot and Niesta (2008) that the color red enhanced the attractiveness of women to men. Guéguen and Jacob (2014) recruited 11 waitresses and manipulated the color of the T-shirt that each waitress wore during a lunch hour. Each waitress wore six colors of T-shirts, randomized across days. Guéguen and Jacob (2014) hypothesized that the increased attractiveness on days a waitress wore a red T-shirt would produce an increase in both the number and amount of tips for men only. The results supported both hypotheses. Only the color red produced an increase in the number and amount of tips, and only in men.

Lynn et al. (2016) attempted to replicate the effect of red clothing on tip amounts. Their procedure was different from Guéguen and Jacob (2014). The procedure used an online survey where participants were shown a picture of a waitress or waiter, wearing a red, white, or black shirt, and presented with a hypothetical bill for a meal. Participants were asked to indicate the tip amount that would leave for that bill and later asked to rate the attractiveness of the server. The result of interest is that men left significantly lower tip amounts for waitresses wearing a red shirt, directly contradicting the results of Guéguen and Jacob (2014). Additionally, wearing red did not increase the attractiveness of a person to people of the opposite sex, contrary to the results of Elliot and Niesta (2008) and Elliot et al. (2010).

There are theoretical concerns with the red avoidance-motivation hypothesis as presented by Mehta and Zhu (2009), Genschow et al. (2012), and Bruno et al. (2013). First, there are unexplained gaps in the development of predictions. Mehta and Zhu (2009) reported that red increased speed of solutions of avoidance-themed words (although the effect could not be replicated by Steele, 2014.) Genschow et al. (2012) applied these results to a hypothesis about the consumption of snack foods. Bruno et al. (2013) generalized the pretzel consumption results to an effect on the use of skin cream. It is unclear why one would expect this pattern of transfer of effects to occur.

Reutner et al. (2015) introduced an additional distinction in prediction of the effect of red on food consumption. A general avoidance of red would be dysfunctional since red may signal either edibility (ripe fruits) or inedibility (poisonous Holly berries). They posited that the suppressive effect of red would occur with unhealthy foods but not with healthy foods. Reutner et al. (2015) reported that consumption of chocolate (the unhealthy food) was decreased when presented on red plates, but the amount of dark grapes (the healthy food) consumed was unaffected whether it was presented on red or white plates. A second experiment examined the consumption of bread cubes. Bread was classified as healthy (brown flour), neutral (mixed flour), or unhealthy (white flour). Participants were presented with a plate of one type of bread in which the cubes were indicated by small red or green flags and asked to choose a bread cube. Reutner et al. (2015) reported that avoidance of the red-flag option was highest in the unhealthy bread condition and lowest in the healthy condition.

The reasoning behind the results of Reutner et al. (2015) is difficult to follow. It is true that a general avoidance effect by red would be dysfunctional, but it was unexplained why the suppression should be tied to unhealthy foods. The issue of snack food consumption is complex, but snacking is a worldwide phenomenon and the amount of snack food consumed per capita has increased in recent years (Bellisle, 2014; Piernas & Popkin, 2010). Major corporations that provide access to calorie-dense, high-fat, and high-sugar foods often feature prominently the color red in their logos and packaging (e.g., Pizza Hut, Kentucky Fried Chicken, McDonald's, Wendy's, and Coca-Cola). Such widespread use of the color red by the fast-food industry appears to contradict the assumption that red should suppress consumption of unhealthy foods. Spence et al. (2015) found that *sweet* was the most common flavor associated with red across several countries.

There is an important difference between the experiments of Genschow et al. (2012), Bruno et al. (2013), Reutner et al. (2015), the current experiment, and exposure to red from the fast-food corporations. The aforementioned experiments involved a brief exposure to red with no programmed affective consequences. McDonald's and other corporations expose people to their red on many occasions, and those exposures are accompanied by programmed emotional appeals. One way to reconcile the different results of Genschow et al. (2012), Bruno et al. (2013), and the current experiment is to posit that the effects are transient variations on an initial exposure that may not indicate the long-term effect of exposure to the color red in that situation. A question to be answered is, whether repeated exposures to pretzels or chocolate chips on a red plate leads to a long-term reduction in consumption?

In sum, the current study tripled the number of participants and followed the procedures used by Genschow et al. (2012) and Bruno et al. (2013) in an attempt to verify their reports that exposure to a snack food on red plates produced a decrease in food consumption. The results of the current study showed the opposite effect. More pretzels were eaten when they appeared on red plates. The

safest conclusion is that use of the color red may not be a reliable way to reduce snack food consumption.

References

Bellisle, F. (2014). Meals and snacking, diet quality and energy balance. *Physiology & Behavior*, *134*, 38–43. https://doi.org/10.1016/j.physbeh.2014.03.010

Bruno, N., Martani, M., Corsini, C., & Oleari, C. (2013). The effect of the color red on consuming food does not depend on the achromatic (Michelson) contrast and extends to rubbing cream on the skin. *Appetite*, *71*, 307–313. https://doi.org/10.1016/j.appet.2013.08.012

Elliot, A. J., & Maier, M. A. (2012). Color-in-context theory. *Advances in Experimental Social Psychology*, *45*, 61–125. https://doi.org/10.1016/b978-0-12-394286-9.00002-0

Elliot, A. J., Maier, M. A., Moller, A. C., Friedman, R., & Meinhardt, J. (2007). Color and psychological functioning: The effect of red on performance attainment. *Journal of Experimental Psychology: General*, *136*(1), 154–168. https://doi.org/10.1037/0096-3445.136.1.154

Elliot, A. J., & Niesta, D. (2008). Romantic red: Red enhances men's attraction to women. *Journal of Personality and Social Psychology*, *95*(5), 1150–1164. https://doi.org/10.1037/0022-3514.95.5.1150

Elliot, A. J., Niesta Kayser, D., Greitemeyer, T., Lichtenfeld, S., Gramzow, R. H., Maier, M. A., & Liu, H. (2010). Red, rank, and romance in women viewing men. *Journal of Experimental Psychology: General*, *139*(3), 399–417. https://doi.org/10.1037/a0019689

Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, *39*(2), 175–191. https://doi.org/10.3758/bf03193146

Flegal, K. M., Carroll, M. D., Ogden, C. L., & Curtin, L. R. (2010). Prevalence and trends in obesity among US adults, 1999-2008. *Journal of the American Medical Association*, *303*(3), 235–241. https://doi.org/10.1001/jama.2009.2014

Genschow, O., Reutner, L., & Wänke, M. (2012). The color red reduces snack food and soft drink intake. *Appetite*, *58*(2), 699–702. https://doi.org/10.1016/j.appet.2011.12.023

Guéguen, N., & Jacob, C. (2014). Clothing color and tipping: Gentlemen patrons give more tips to waitresses with red clothes. *Journal of Hospitality & Tourism Research*, *38*(2), 275–280. https://doi.org/10.1177/1096348012442546

Lynn, M., Giebelhausen, M., Garcia, S., Li, Y., & Patumanon, I. (2016). Clothing color and tipping: An attempted replication and extension. *Journal of Hospitality & Tourism Research*, *40*(4), 516–524. https://doi.org/10.1177/1096348013504001

Marchiori, D., Waroquier, L., & Klein, O. (2011). Smaller food item sizes of snack foods influence reduced portions and caloric intake in young adults. *Journal of the American Dietetic Association*, *111*(5), 727–731. https://doi.org/10.1016/j.jada.2011.02.008

Mehta, R., & Zhu, R. (2009). Blue or red? Exploring the effect of color on cognitive task performances. *Science*, *323*(5918), 1226–1229. https://doi.org/10.1126/science.1169144

Ogden, C. L., Carroll, M. D., Kit, B. K., & Flegal, K. M. (2014). Prevalence of childhood and adult obesity in the United States, 2011–2012. *Journal of the American Medical Association*, *311*(8), 806–814. https://doi.org/10.1001/jama.2014.732

Pashler, H., & Wagenmakers, E. J. (2012). Editors' introduction to the special section on replicability in psychological science. *Perspectives on Psychological Science*, *7*(6), 528–530. https://doi.org/10.1177/1745691612465253

Piernas, C., & Popkin, B. M. (2010). Snacking increased among U.S. Adults between 1977 and 2006. *Journal of Nutrition*, *140*(2), 325–332. https://doi.org/10.3945/jn.109.112763

Reutner, L., Genschow, O., & Wänke, M. (2015). The adaptive eater: Perceived healthiness moderates the effect of the color red on consumption. *Food Quality and Preference*, *44*, 172–178. https://doi.org/10.1016/j.foodqual.2015.04.016

Rohr, M., Kamm, F., Koenigstorfer, J., Groeppel-Klein, A., & Wentura, D. (2015). The color red supports avoidance reactions to unhealthy food. *Experimental Psychology*, *62*(5), 335–345. https://doi.org/10.1027/1618-3169/a000299

Rolls, B. J., Roe, L. S., Kral, T. V. E., Meengs, J. S., & Wall, D. E. (2004). Increasing the portion size of a packaged snack increases energy intake in men and women. *Appetite*, *42*(1), 63–69. https://doi.org/10.1016/s0195-6663(03)00117-x

Rolls, B. J., Roe, L. S., & Meengs, J. S. (2006). Larger portion sizes lead to a sustained increase in energy intake over 2 days. *Journal of the American Dietetic Association*, *106*(4), 543–549. https://doi.org/10.1016/j.jada.2006.01.014

Schmidt, S. (2009). Shall we really do it again? The powerful concept of replication is neglected in the social sciences. *Review of General Psychology*, *13*(2), 90–100. https://doi.org/10.1037/a0015108

Spence, C., Wan, X., Woods, A., Velasco, C., Deng, J., Toussef, J., & Deroy, O. (2015). On tasty colours and colourful tastes? Assessing, explaining, and utilizing crossmodal correspondences between colours and basic tastes. *Flavour*, *4*(1), 1–17. https://doi.org/10.1186/s13411-015-0033-1

Steele, K. M. (2014). Failure to replicate the Mehta and Zhu (2009) color-priming effect on anagram solution times. *Psychonomic Bulletin and Review*, *21*(3), 771–776. https://doi.org/10.3758/s13423-013-0548-3

Steele, K. M., & Rash, L. L. (2021). Open materials and data for "Is the suppression effect of the color red on snack food consumption reliable?". https://doi.org/10.17605/osf.io/7erud

Wang, Y. C., McPherson, K., Marsh, T., Gortmaker, S. L., & Brown, M. (2011). Health and economic burden of the projected obesity trends in the USA and the UK. *The Lancet*, *378*(9793), 815–825. https://doi.org/10.1016/s0140-6736(11)60814-3

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