

Contingent Choice: Exploring the Relationship Between Sweetened Beverages and Vegetable Consumption

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## Abstract

Adults and children are repeatedly exposed to the pairing of food and drink as found in meal deals and “combos.” There may arise from this indoctrination, a contingent relationship between drink context and food preference. Our multi-method research examines food and drink combining. A survey-based study examines the food and drink pairing preferences of adults ( $N = 60$ ), while a laboratory study with young children ( $N = 75$ , aged three to five) examines the role of drink context on vegetable consumption. The adult survey finds strong food and drink combining preferences. The pairing of soft drinks with calorie dense foods is regarded favorably, while the pairing of soft drinks with vegetables is not. In child food trials, vegetable consumption is not influenced by the child’s fussiness but is influenced by the drink accompaniment. In limited contexts, these findings demonstrate the contingent relationship between drink context and food consumption. Both palate preference and associative learning may be mechanisms driving the effects of drink context on food consumption. The findings suggest simple consumer strategies that might be employed to change dietary patterns (e.g., drink water with meals), and hold straightforward policy implications (e.g., increase water as the default option in meal deals).

Keywords: food choice, marketing, children, vegetables, soft drink, soda, palate

It has recently been suggested that one's developed palate may play a role in the obesity epidemic faced in many societies (Cornwell & McAlister, 2011). The thinking is that, despite being malleable over time, the taste preferences for sugar, salt and fat that are developed early in life set the stage for diets high in calories and low in nutrients. Although not addressing food and drink combining, Cornwell and McAlister's study of young children did find that knowledge of fast-food and soda brands was linked to development of a preference for sugar, salt and fat. This raises the question of how one comes to hold food and drink preferences and the role they play in dietary intake. We suggest in this research that marketing may play a role in establishing expected food and drink combinations. Empirically, we examine the relationship between beverage context and food preference and choice.

Beverage consumption and the relationship of drink to food consumption is an area seeing increasing researcher attention and with good reasons. First, individuals do not appear to compensate for calories in their total energy intake when those calories are consumed as a beverage (Stookey, 2010). Second, the eating rate for liquids allows rapid ingestion and this is positively related to energy intake (Viskaal-van Dongen, Kok & Graaf, 2011). Third, modern diets tend to involve high intake of sugar-sweetened beverages (Lasater, Piernas & Pokin, 2011) and at the same time not enough water (Armstrong, 2010; Patel & Hampton, 2011). Importantly, children's intake of sweetened beverages is positively associated with BMI, waist circumference, and poor dietary choices (Collison et al., 2010) while the intake of water is associated with preferable dietary profiles in children (Stahl et al., 2007) and weight management (specifically reduced excess weight gain, Stookey, 2010).

Early learning about food and drink is influenced by availability within a child's environment (Aldridge, Dovey & Halford, 2009) and so in many cultures, commercially

available food and drink combinations may influence preference and choice. International research conducted in Cardiff, Wales gives some insight to the practical and social challenges of food and drink choice. This qualitative study of the dental health of thirty-three parents/caregivers of children aged three years and under found many barriers to giving young children water to drink, including child rejection and negative adult feelings that it was “cruel” to offer water instead of a sweet drink and drinking water was a signal of poverty (Chestnutt, Murdoch & Robson, 2003).

Meal deal “combos” and “bundled” food products are popular and have behavioral consequences. Generally speaking, food and drink items are valued more highly (Venkatesh & Kamakura, 2003) and consumed in greater amounts (Stremersch & Tellis, 2002) when offered as part of a bundle. Although not focused on food combining per se, research on young adults’ restaurant choice shows correlates with dietary patterns (Larson et al., 2011) and particular restaurants are known for their use of combo meals. In Larson et al.’s study of over two thousand young adults, frequent use of fast-food restaurants serving burgers and fries was associated with high risk of overweight/obesity, high caloric intake and, interestingly, high intake of sugar-sweetened beverages and fat. “Those who reported burger-and-fries restaurant use on three or more occasions per week consumed nearly one additional sugar-sweetened beverage per day as compared to those who reported burger-and-fries restaurant use on less than one occasion per week” (Larson et al., 2011, p. 1696). By contrast, Larson and colleagues also found that full service (sit down and order) restaurant use was unrelated to weight status but positively related to higher intake of vegetables. Researchers have expressed concern that combo meals (i.e., soda and fries paired with an entrée) not only inflate caloric intake but also threaten the potential efficacy of proposed policy interventions. For example, Sharpe and Staelin

(2010) argue that proposed soda taxes may have little effect on reducing overall caloric intake when bundles incorporating soda remain available.

Consumption of combo meals often begins early in life, with most children having consumed a combo meal (typically soda, fries, and burger) by age three or four (Schlosser, 2001). In addition to restaurants, grocery stores provide parents with options such as Lunchables (pre-packaged combinations of food and drink) targeted for children. Lunchables offered in the US include, for example, the Turkey + Cheddar Sub (turkey and cheddar on a wholegrain sub, packaged with sweet wafers, and spring water with Kool-Aid sweetening singles) or as an alternative, the Lower Fat Turkey and Cheddar Cracker Stackers (turkey and cheddar packaged with crackers and including a Capri Sun sweetened drink and fat free chocolate pudding). In response to concerns over obesity, Lunchables in the UK, as of 2004, no longer contain Capri Sun.

Whether it is through palate training or through other psychological mechanisms, individuals may come to anticipate certain items in combination and purchase them together even after a promotional effort has ended. As an example, increased consumption of Coke with breakfast has been credited to a late 1980s campaign that suggested “I need a Coke in the morning” (Schmeltzer, 2007). Of interest in the present research, is the notion that the seemingly pervasive practice of bundling particular “types” of food and drink may habituate individuals to the complementary tastes of the paired items.

Taste habituation, if it were observed, would hold important implications not only in the marketplace but also in consumer-planned consumption. For example, experience with a burger/cola combo in a fast-food restaurant may result in an individual seeking a similar entrée when consuming a glass of cola at home. The development of taste preferences that favor food

and drink combining might drive decision-making but an alternative explanation might be found in associative learning (De Houwer, Thomas & Baeyens, 2001) or even cueing (Gall, Barnett, Lew & Selmants, 1987). Associative learning would suggest that past experiences lead to expectations about liked combinations, whereas cueing theory would suggest that the presence of one cue such as cola makes the person think of its savory accompaniment or visa versa. Before further examination, the stereotype of combining behaviors needs to be documented as a pervasive tendency.

The present research includes a survey study with young adults and lab work with young children. The purpose of the Study 1 survey is to establish the extent to which stereotypical food combinations are prevalent. As indicated above, we anticipate that marketplace offerings will have instilled in consumers an expectation that particular food and drink items belong together. Hence, we predict that adults will agree that certain combinations make sense, while other food/drink pairings will be perceived as “wrong.”

### Study 1: Survey Study with Young Adults

#### Survey Method

A short survey was designed to explore expectations regarding acceptable food/drink combinations. Following University of Michigan Institutional Review Board approval, undergraduate students were asked to participate. Data were collected in the Fall of 2009. As part of a larger study, 60 participants responded to questions about their food/drink preferences. Students were invited to provide demographic information, however, this was a soft requirement and not all participants complied. The available data indicate that the age range was roughly 19 to 23 years (only undergraduate students were recruited and this was the age range obtained from those who provided their demographic information), and the gender split was roughly even.

Students were recruited via an invitation in class across four programs in kinesiology: movement science, athletic training, physical education and sport management. Participants were not compensated for participation. Eight items regarding the participants' agreement with various food and drink combinations were posed. For example, participants were asked if "Pizza goes well with tap water or plain bottled water." A five-point scale was used to record responses (response anchors were 1 = disagree; 5 = agree).

### Study 1 Results

Survey findings are detailed in Table 1. Participants' strongest feelings pertained to foods paired with soda. Highest agreement was observed when soda was paired with French fries ( $M = 4.20, SD = .93$ ) or with pizza ( $M = 4.17, SD = 1.06$ ). By contrast, participants disagreed with soda being a suitable complement to raw or cooked vegetables ( $M_s = 1.83$  and  $1.93$ , respectively). The difference between average ratings of soda paired with the aforementioned energy dense foods ( $M = 4.19$ ) and vegetables ( $M = 1.85$ ) was significant,  $t(1, 59) = 20.16, p < .001$ . On the other hand, plain water received mostly average ratings, indicating that it was a reasonable complement to most foods.

Insert Table 1 about here.

### Study 1 Discussion

The finding that participants were more accepting of pairings of high-calorie foods and soda is consistent with our expectations. One could argue that calorie dense foods "naturally" pair well with soda but this would seem to vary across cultures, for example, green tea is commonly paired with calorie dense foods in Japan (McDonald's, 2011). From an associative learning perspective, we know that many taste related perceptions and decisions are decidedly

complex and culturally based. For example, food consumption habits influence the perception of taste. In a cross-cultural study, French and Vietnamese participants tasted mixed solutions of sweet lemon, sweet vanilla, sour lemon and sour vanilla (Valentin, Chrea & Nguyen, 2006). Interaction comparisons showed that French participants experienced sweet enhancement in the presence of vanilla with the logic being that vanilla is used in France to flavor sweet dishes but this is not the case in Vietnam. The cultural influence of regular food and drink pairings may represent the same type of subtle, largely unexamined learning. Thus, important to our second study is the finding that sweet beverages are not perceived to combine well with vegetables in this sample of young US adults. When we consider this in light of the previously mentioned resistance on the part of parents and caregivers to serve young children water, the result is a drink context for the child that may negatively impact vegetable consumption.

#### Study 2: Lab Study of Children's Taste Preferences

The lab study examines children's acceptance of raw vegetables as a "snack" paired with either a sweetened beverage or with plain water. It builds on the survey study findings by using measures of actual physical consumption, rather than a survey measure of acceptance of various combinations. Children are the population of interest because there is a need to understand how preferences develop at a young age. Interventions targeting dietary change may be more effective with younger participants (McAlister & Cornwell, 2010). Hence, we are interested in learning about conditions that might influence food consumption among very young children. Though beverage context (sweet drink vs. water) is central to our interests, our study addresses the possibility that fussiness may explain vegetable consumption (or lack thereof) among preschool children.

Importantly for our research, established food preferences in childhood influence food



choice over the lifespan and have both short- and long-term health consequences (Kemmer, 1987). Research on the development of taste preferences finds repeatedly that children prefer sweet and salty tastes (Wardle & Cooke, 2008). Fewer studies document a preference for sour tastes in children (Blossfeld, et al., 2007; Liem & Mennella, 2003). While the taste contribution of fat has not been as frequently studied in children; in animal studies, the enhancing nature of fat when combined with sucrose results in avid consumption (Naleid, et al., 2008). Vegetable bitterness has been established as one reason for child resistance to trial but repeated exposure to vegetables has been shown to increase liking in children aged five to seven (Wardle et al., 2003), as well as school aged children (Lakkakula et al., 2011).

Northstone and colleagues (2005) used multivariate analysis to consider a UK survey of diets of families with children at age four and again when seven. Using principal components analysis, three dietary patterns were established cross-sectionally: a diet based on “junk-type foods” having high sugar and fat from processing; a “traditional” diet based on meat, potatoes, and vegetables; and a “health conscious” diet associated with vegetarian foods, rice, pasta, salad, and fruit. Children with the “junk” diet showed increased tendency to be a “difficult eater” as compared to those in the traditional and healthy patterns. Since the research was correlational, there was no discussion of causality. Thus, it may be that having a difficult eater is likely to result in a parent offering junk food to encourage a child to eat or, alternatively, it may be that having a junk food dietary pattern results in parents reporting difficulties with feeding a child. This research finding opens a question: Is the picky, fussy or difficult eater developed through food exposure patterns? Importantly for this research, it suggests that fussiness is a variable to consider.

The main hypotheses addressed in this study are as follows:

H1: There will be a significant negative relationship between fussiness and children's acceptance of vegetables. Children with higher fussiness scores will consume smaller amounts of vegetables than children with lower fussiness scores.

From the survey study, we found strong inclinations against the pairing of soft drinks with cooked or raw vegetables.

H2: There will be a significant relationship between type of beverage (sweetened drink vs. water) and children's acceptance of vegetables. Children will consume a smaller amount of vegetables on the sweet drink taste trial than on the water trial.

## Study 2 Method

*Participants.* Following University of Michigan Institutional Review Board approval, consent was obtained to work with 75 children. This sample included 40 boys and 35 girls, aged 3y6m to 5y3m ( $M = 4y6m$ ,  $SD = 6m$ ). This sample showed variance in children's BMI scores (adjusted for age and gender), however, these scores are not considered in analyses since BMI data were missing for 15 children. For the 60 children whose BMI data were obtained from the preschool nurse, adjusted scores ranged from 14.10 to 21.10 ( $M = 16.35$ ,  $SD = 1.53$ ). Data were collected from February to May of 2010.

One parent of each child was asked to participate in a brief survey. Survey responses were obtained from 52 of the 75 participating families. Participating parents included five fathers and 47 mothers aged 21 to 55 ( $M = 31.63$ ,  $SD = 9.50$ ). Families were recruited from a large and diverse preschool that had many middle class families. Parents were recruited for participation (theirs and their child's) via requests sent home in children's backpacks. Each participating family was offered a \$10 gift card.

*Materials and procedure.* As detailed below, parents completed a survey about their

child's fussiness regarding eating, and exposure to various foods. Children took part in two trials of a taste-sampling task. Child activities were conducted one-on-one in a quiet room at the preschool. Each child was seen on separate occasions (two times for the separate taste-test trials).

The take-home survey used seven items for parents to rate their child's fussiness with eating (e.g., "My child is afraid to eat things s/he has never had before."). We preferred this over the one-item scale measuring a child as a difficult eater as utilized in prior research (Northstone et al., 2005). Items utilized were adapted from Pliner's (1994) Food Neophobia Scale and included two reverse-coded items (e.g., "My child will eat almost anything."). Responses to fussiness items were recorded on a five-point scale (1 = strongly disagree, 5 = strongly agree). The fussiness scale showed high internal consistency ( $\alpha = .92$ ). Hence, a fussiness scale score was calculated for each child by averaging across the seven items. Note that two teachers also completed this section of the survey for each child. Teacher and parent ratings were highly correlated, indicating that parents were honest in reports regarding their children, thus, parent data are used in the analyses.

Parents were asked to report, on average, how many times per week their child was served each of the following foods: raw red bell pepper; water as the only drink with a meal; Cheese Nips, Goldfish or similar (savory cracker snacks); raw mini carrots or carrot sticks; Hawaiian Punch (sweetened beverage) with a meal; Oreo, Chips Ahoy or similar (sweet cookie snacks); Hawaiian Punch Lite or other artificially sweetened beverage; celery sticks; soda or pop; grapes (green, red or purple); "fast food." These food and drink items were selected to represent a variety of foods typically served to young children. Of particular interest were the items relating to red peppers, carrot sticks, Hawaiian Punch, and water, since these items are

used in the taste test with the child participants. These vegetables were selected because they are readily available year round (our youngest participants might not remember an avocado from last season), were relatively familiar to young children, and easily served.

Children completed two taste-test trials. Each trial lasted a maximum of five minutes, although children were permitted to finish early if they wished. On each occasion, children were served a drink and raw vegetables. Children could drink as much as 180mL of the beverage, but there was no limit to the amount of vegetables served during the five-minute period. The vegetables on offer were the same for both trials, namely, carrot sticks and red pepper. The child could choose one or both of the vegetables offered. The drinks differed per trial: one trial offered water and the other offered Hawaiian Punch. The order of administration of trials was counterbalanced. For each trial, the experimenter recorded the amount of drink consumed (0 – 180mL), the time taken (0 – 5min), and the total weight of vegetables consumed (pepper and carrot combined).

Children at the test site were either on a morning or afternoon schedule. Morning program children consume breakfast at the preschool each day, shortly after arriving. Afternoon program children consume lunch at the preschool every day, shortly after arriving. For our experimental taste test trials, children were brought to the test area at least one hour after finishing whichever meal was served to them by the preschool. Thus, all sessions occurred at approximately the same time relative to the most recent meal. The food and drink were not discussed as being a “snack” because this might evoke ideas about the typical food and drink the child would have as a snack, rather the children were told that they would be offered food and drink.

## Study 2 Results

*Characterizing fussy eaters.* Fussiness with eating was first examined by checking the distribution of fussiness scale scores among the children sampled. The scale showed good variance and a mean near the mid-point ( $M = 2.84, SD = 1.19$ ). Hence, the sample includes some fussy eaters and some easily pleased eaters, but overall the group is “normal.”

*Fussiness as it relates to food exposure and food sampling.* Prior to testing H1 (that fussier eaters will eat smaller amounts of vegetables on each of the taste-test trials), we first examined the extent to which fussiness is related to a child’s history of exposure to various foods. In particular, we were interested to learn whether fussy eaters were any less familiar with the vegetables served during the taste test, than were less fussy eaters. Therefore, we examined correlations between fussiness and parent reports of how frequently they serve each of these vegetables to their child. No significant findings emerged. Child fussiness was not related to frequency of exposure to red pepper ( $r = .05, p = .72$ ), nor to carrot ( $r = -.25, p = .07$ ), nor any other foods or beverages (see Table 2).

Insert Table 2 about here.

We next examined the hypothesis that fussiness would influence the amount of vegetables consumed on each of the taste-test trials. Though the trend was in the expected direction, no significant results emerged. Fussiness scale scores were not significantly related to the amount of vegetables consumed with Hawaiian Punch ( $r = -.16, p = .34$ ), nor to the amount of vegetables consumed with water ( $r = -.12, p = .44$ ). H1 was not supported.

*Beverage type and vegetable consumption.* Initial checks showed no differences in the amount of drink or vegetables consumed on either trial, as a function of either trial order (water trial first vs. Hawaiian Punch trial first) nor as a function of time of day (morning vs. afternoon testing). Hence, these variables are not included in the analysis or subsequent discussion.

During data collection sessions, we had observed that Hawaiian Punch seemed more popular than water. This was supported by the finding that the average amount of Hawaiian Punch consumed ( $M = 123.56\text{mL}$ ,  $SD = 64.77\text{mL}$ ) was greater than the average amount of water consumed ( $M = 54.60\text{mL}$ ,  $SD = 55.15\text{mL}$ ),  $F(1, 68) = 57.56$ ,  $p < .001$ , partial  $\eta^2 = .78$ .

Importantly, support was found for H2. Children ate a larger portion of vegetables on the water trial ( $M = 19.06\text{g}$ ,  $SD = 20.21\text{g}$ ) than on the Hawaiian Punch trial ( $M = 14.07\text{g}$ ,  $SD = 14.61\text{g}$ ),  $F(1, 69) = 7.33$ ,  $p = .009$ , partial  $\eta^2 = .10$ .

### Study 2 Discussion

These findings show that vegetables are more popular when the drink consumed is water. Since a child's fussiness regarding food has been ruled out as an explanation for variance in vegetable consumption, it seems that consumption is in part dependent on the beverage available to children. Our findings on the relationship between food fussiness and vegetable intake may have been influenced by our choice of vegetables (these are not bitter tasting) and the choice allowed the child. Carrot sticks were commonly offered in the preschool and were thus known to be familiar and the child could avoid the less familiar red pepper by choosing only carrots.

The findings suggest that the consumption of a sweetened beverage such as Hawaiian Punch might "prime" a child's palate to be less accepting of raw vegetables. The amount of vegetables consumed on the Hawaiian Punch trial was not significantly related to the amount of drink consumed ( $r = .07$ ,  $p = .55$ ). Even after consuming only a small amount of the sweetened drink, children were relatively disinterested in eating vegetables. This may suggest that the consumption of even a small amount of sweetened beverage leads a child to be less accepting of vegetables.

The greater average amount of vegetables consumed on the water trial hints that

provision of water as the only beverage at meal or snack times might encourage greater consumption of vegetables among young children. This possibility is discussed in greater detail in the General Discussion, however, it is important to also note that the amount of vegetables consumed by the children in this study was relatively small. When compared to USDA (2003) guidelines for the recommended serving size of children's "snacks," our participants' consumption of an average of 19.06 grams of vegetables on the water trial equates to roughly half of the standard snack size which is set at 1.25oz (35.43 grams equivalent). Thus, although the amount taken varied, it could be considered for most participating children, to be a small snack.

### General Discussion

Our survey study lends empirical support to the notion that young adults do indeed hold strong drink and food combining preferences. While plain water (bottled or from the tap) pairs reasonably with most foods, soda is perceived as clashing with cooked and raw vegetables but pairing very well with foods such as French fries and pizza. This finding across young adults allows for the possibility that early, learned preferences contribute to adult consumption patterns.

In the lab study, children's acceptance of raw vegetables was related to the type of drink consumed, and was not an outcome of their general fussiness regarding eating. This finding reiterates what was learned in the survey study. Vegetables offered in combination with a sweetened beverage are not looked upon as favorably as vegetables offered in combination with water. This finding points to a variety of behavioral change strategies that might be employed to encourage healthier eating among young children (detailed in the next section).

Additional research is needed to more fully understand the mechanisms by which sweetened beverage consumption reduces child acceptance of raw vegetables. We suggest two

competing hypotheses, which may not be mutually exclusive. First, a physiological mechanism may be at play, wherein children's palates are less accepting of certain flavor combinations. The sweetness of Hawaiian Punch may not sit well with the less sweet (and somewhat bitter) taste of raw vegetables. Alternatively, psychological mechanisms might explain the observed results. Although children are relatively inexperienced with marketing, these youngsters do have some limited experience with pairings in their culture. At any age, consumers rely on heuristics to aid their decision-making (Scheibehenne, Miesler & Todd, 2007), however, children with their limited cognitive capacities may be more likely to rely on stereotype judgments of which food/drink combinations they believe are appropriate.

Extending on this notion of associative learning, the combination of Hawaiian Punch with vegetables might be novel for these children. If children are simply not used to eating vegetables with sweetened drinks, this might explain the lower vegetable consumption on the sweet drink trial. If this is true, an implication might be that in circumstances where parents feel that sweetened drinks "belong" (e.g., perhaps as a treat at birthday parties), vegetables and other healthful foods should be made available so that children do not learn that the presence of a sweetened beverage necessarily indicates that healthful foods "do not belong."

Whether the influence of drink type on vegetable consumption is physiological or psychological, there is suggestion that the influence is quite powerful and therefore deserving of intervention. Given that the amount of Hawaiian Punch consumed did not correlate with the amount of vegetable consumption, we know that even limited exposure results in lessened acceptance of vegetables. Seeing the Hawaiian Punch may bring to mind for the child associations with contexts in which vegetables are rarely served. Alternatively, tasting even a small sip of a sweetened beverage may prime the palate to anticipate foods regularly paired with



sweet drinks. Additional research could examine whether children's consumption of foods typically paired with sweet drinks (e.g., chips, French fries, pizza) is heightened when the beverage consumed is sweet versus when water is served.

Fussiness was a non-predictor of how frequently children had been served various vegetables. The trend suggests that a larger sample might find fussiness does play a role in food choice but it also leaves open the possibility that drink context is an important and previously unaccounted for variable. Fussiness was also not a predictor of consumption in this study but as mentioned, these vegetables were not bitter and the child had a choice of vegetable.

It is important to consider these findings in light of other studies that examine vegetable intake. Firstly, the current work is different from many flavor-flavor learning studies (e.g., Hausner, Olsen & Møller 2012) that explore sweetening vegetables to support taste learning or serving one target vegetable for consumption with a well-liked one (Olsen et al 2012). In the current work, the sweet drink serves as the eating context of interest and is what the child experiences before and during vegetable consumption. While, a sweet drink might be used in flavor-flavor learning, or given to the child as a reward for trying a vegetable several times (for other reward work see Cooke et al. 2011), our orientation is toward the development of palate without sugar or other sweeteners.

The current research opens many questions and may also provide a missing explanation of the drivers of food intake. For example, it may be the case that home exposure to vegetables as well as successful researcher interventions showing developed vegetable liking (Lakkakula et al., 2010) may be subsequently sabotaged by drink context effects. Even if a child chooses a liked vegetable in a school cafeteria, they might not consume this vegetable when the chosen drink pairs well with the main course (hamburger, pizza) but not the vegetable.

*Policy implications and suggestions for change.* Our survey study of young adults suggests that contingent relationships between food and drink are real and powerful. Against a backdrop of past research where young adults frequenting burger-and-fries type restaurants are found to drink additional sugar-sweetened beverages, the research questions the role of food bundling and combo meals in dietary intake patterns.

If even the smallest exposure to sweetened beverages affects children's acceptance of vegetables, there is need for action. Eating environments should foster positive dietary habits, rather than discourage vegetable consumption, especially since eating patterns established early in life persist over time and are linked to adult health outcomes (Kemmer, 1987). Possible voluntary industry decisions include offering only water as the default drink in combo meals, especially when targeting children. Likewise, buffet restaurants – where children frequently serve themselves – might limit visual and physical access to soda by replacing all-you-can-drink soda fountains with water fountains. If soda is offered, access to it may be less convenient (e.g., having to order soda rather than being able to help oneself). Similar measures could be implemented in the home environment. For example, parents could implement the very straightforward policy of serving only water with meals, particularly if their child is already overweight/obese. Sweetened beverages could be kept out of sight, or not be kept in the home.

While some of these changes may sound radical, many are already being trialed in California preschools. The Healthy Beverages in Child Care act was signed into law in California in 2010. The act specifies provisions, which go into effect in 2012, and require that licensed child day care facilities in California must serve no beverages with added sweeteners (either natural or artificial) and must make clean and safe drinking water readily available and accessible for consumption throughout the day (Robert Wood Johnson Foundation, 2011). It

would be valuable to ascertain if policy changes such as this regarding beverages also influence food consumption. Governments, municipalities, schools and individuals are perplexed by the food and drink landscape that appears to relentlessly foster obesity. On balance, the potential of a simple move to water as the drink context for meals offers few downside risks and many potential advantages.

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Table 1

*Survey study: Participants' agreement with various food/drink pairings*

Item	<i>M</i>	<i>SD</i>
French fries go well with a cola beverage such as Coke, a flavored soda, or Fanta.	4.20	.93
Pizza goes well with a cola beverage such as Coke, a flavored soda, or Fanta.	4.17	1.06
Raw vegetables such as carrot or celery sticks go well with tap water or plain bottled water.	4.15	1.14
Pizza goes well with tap water or plain bottled water.	3.51	1.08
Steamed vegetables such as asparagus and broccoli go well with tap water or plain bottled water.	3.20	1.38
French fries go well with tap water or plain bottled water.	2.86	1.11
Steamed vegetables such as asparagus and broccoli go well with a cola beverage such as Coke, a flavored soda, or Fanta.	1.93	.96
Raw vegetables such as carrot and celery sticks go well with a cola beverage such as Coke, a flavored soda, or Fanta.	1.83	.84



Table 2

*Child lab study: Correlations between fussiness and how frequently children are served various types of food and drink*

Vegetables / fruits	Beverages (as the only drink served with a meal)	Snacks / meals
Red bell pepper: .05	Water: .10	Cheese Nips, Goldfish or similar: -.08
Carrot: -.25	Hawaiian Punch: -.18	Oreos, Chips Ahoy or similar: -.10
Celery sticks: -.14	Hawaiian Punch <i>Lite</i> : -.03	Fast food: -.07
Grapes: -.13	Soda or pop: -.09	

*Note: None of these correlations is significant at the .05 level.*