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Nudge to nobesity II: Menu positions influence food orders

Eran Dayan* Maya Bar-Hillel†

Abstract

"Very small but cumulated decreases in food intake may be sufficient to have significant effects, even erasing obesity over a period of years" (Rozin et al., 2011). In two studies, one a lab study and the other a real-world study, we examine the effect of manipulating the position of different foods on a restaurant menu. Items placed at the beginning or the end of the list of their category options were up to twice as popular as when they were placed in the center of the list. Given this effect, placing healthier menu items at the top or bottom of item lists and less healthy ones in their center (e.g., sugared drinks vs. calorie-free drinks) should result in some increase in favor of healthier food choices.

Keywords: choice architecture, menu, middle bias, edge bias, nudge, obesity, position effects.

1 Introduction

Obesity is a growing problem throughout the world. Fighting it via dieting is apparently ineffective (e.g., Mann et al., 2007; Garner & Wooley, 1991). In a companion paper, Rozin et al. (2011) present arguments and facts to substantiate these two claims, which we shall not repeat here. They then suggest that the war on obesity could benefit from nudges (Thaler & Sunstein, 2008), not only from heavy efforts and investments in resources. Nudges are small, cheap, easily implementable and often hardly noticed changes in the choice architecture (i.e., the manner or setting in which the choice set is presented) that do not affect the choice set itself, yet affect the appeal of different options in it. Rozin et al.'s nudge to nobesity is very simple: if you want to increase or decrease the popularity of a food item, make it easier or harder to access, respectively. In the same spirit, the present paper explores another possible nudge to nobesity. We show that placing a food item on a menu at the beginning or the end of its category increases its popularity compared to placing it in the middle.

Restaurants present customers with lists of their offerings. When the menu is displayed in writing, items are presented simultaneously. When a waiter recites the day's specials, items are presented sequentially. Our study involved only printed menus. Menu items may be organized in various ways, such as by type (e.g., Soups; Salads; etc.), or according to main ingredients (Fish dishes; Vegetarian dishes; etc.). Within each category they are typically listed in vertical ordering. When designing menus, does this order matter?

One may seek answers from two kinds of sources—the "how to" literature on menu design, and the psychological literature on position effects. Familiar position effects such as primacy and recency refer to stimuli presented sequentially, and their dependent variable is not usually choice. But the effect called "edge avoidance" (Rubinstein, Tversky & Heller, 1986), "centrality preferences" (Shaw et al., 2000), "middle bias" (e.g., Attali & Bar-Hillel, 2003), or "center-stage effect" (Valenzuela & Raghubir, 2009) refers to choice from among simultaneously presented options—and the various names indicate the typical findings: "People choosing from an array of identical options reliably prefer the middle ones" (Christenfeld, 1995). When items are not identical, the effect's manifestation is that when options are presented in the middle of an array they are chosen more often than when they are presented on its edges.

These studies do not, of course, apply to options for which position may be inherently important, such as theater or airplane seats, skyscraper floors, restaurant tables, or place in queues. Rather they use options for which it is hard to imagine why position would matter, such as: i. in which of 4 opaque boxes people choose to hide, or seek, a "treasure" (Rubinstein, Tversky & Heller, 1986); ii. similarly, in what position people place, or guess, answers in multiple-choice tests (Attali & Bar-Hillel, 2003); iii. which good they choose from a set of identical (Christenfeld, 1995; Shaw et al., 2000) or non-identical (Valenzuela & Raghubir, 2009) goods offered; iv. what stall they head for in a public bathroom (Christenfeld, 1995); etc. All these studies found that placing an item in the middle, rather than the edges, of the choice set enhanced its popularity.

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*The Hebrew University, Jerusalem

†Corresponding author: Address: Maya Bar-Hillel, Center for the Study of Rationality, The Hebrew University, Jersualem 91904, Israel. Email: maya@huji.ac.il.

Table 1: Item order in the four menus: A=Appetizers; E=Entrées; S=Soft drinks; D=Desserts.

Baseline menu:	A1, A2, A3, A4	E1, E2, E3, E4, E5, E6, E7, E8, E9, E10
	S1, S2, S3, S4, S5, S6	D1, D2, D3, D4, D5, D6, D7, D8
Mirror menu:	A4, A3, A2, A1	E10, E9, E8, E7, E6, E5, E4, E3, E2, E1
	S6, S5, S4, S3, S2, S1	D8, D7, D6, D5, D4, D3, D2, D1
Inside-Out base:	A2, A1, A4, A3	E5, E4, E3, E2, E1, E10, E9, E8, E7, E6
	S3, S2, S1, S6, S5, S4	D4, D3, D2, D1, D8, D7, D6, D5
Inside-Out mirror:	A3, A4, A1, A2	E6, E7, E8, E9, E10, E1, E2, E3, E4, E5
	S4, S5, S6, S1, S2, S3	D5, D6, D7, D8, D1, D2, D3, D4

We are aware of only three exceptions in which there seems to be an advantage to being first or last in a simultaneously presented choice set rather than in its middle. Nisbett and Wilson (1977) asked their subjects to consider a linear array of 4 identical pairs of stockings (a fact of which their subjects were not aware), and serendipitously found a "pronounced left-to-right position effect, such that the right-most object in the array [which was also the last perused] was heavily over-chosen" (p. 243)—namely, "last-is-best". In contrast, Koppell and Steen (2004) analyzed real ballot-voting data that was almost like a controlled study, inasmuch as "the order of candidates' names was rotated by precinct" (p. 267), and found that "candidates received a greater proportion of the vote when listed first than when listed in any other position" (p. 267)—namely, "first-is-best". Finally, Christenfeld (1995) asked respondents to choose a route between two points, either on hypothetical maps or for real. The destination point could not be reached by walking a straight line, but the paths to be chosen from had the same total length and number of turns. Respondents showed a preference for the path reached by making the first turn as late as possible. The paths cannot be classified into first, last, or middle, but the possible points of taking the first turn can, and in that sense, respondents preferred the last.

In contrast to all the above-mentioned findings, the restaurant trade publications on menus advocate *both* edges (namely, the first *and* last) as the positions where one should place the items whose popularity one wants to enhance (e.g., "A menu item's position within a list can also affect sales. People tend to remember the top two items on a list and the bottom item…", Panitz, 2000, p. 82; "People do not read menus, they scan them … As a result, the most frequently selected items are those in the first and last position in the category list…" Main, 1998, p. 80). These recommendations, however, were never backed by research, and none, to the best of our knowledge, exists (Panitz's claim is certainly valid, but it is not clear why one needs to rely much on memory when choosing from a menu). Moreover, when Kincaid and Corsun (2003) attempted to put other accepted truths regarding "the impact of menu layout on item sales" to an empirical test, their title question, "Are consultants blowing smoke?" (p. 226), was answered in the affirmative. However, since they did not study "edge bias" specifically, we have no direct menu results to either contrast with or add to the "edge avoidance" we reported above.

In the present study, therefore, we did not hypothesize a bias either in favor of or against middle positioned items, but rather checked whether one exists, using 2-tailed significance testing.

2 Study 1

2.1 Method

Participants. 240 Hebrew University students, ages 19–35, 52% female, were recruited individually around the campus. Participants were assigned at random to the 4 conditions, in equal numbers.

Design, stimuli and procedure. Four menu versions were prepared, differing only in order of item presentation within category. The menu offered 4 appetizers (A), 10 entrées (E), 6 soft drinks (S) and 8 desserts (D), in that order. The names of the items and their descriptions were copied from that of an Israeli pizzeria chain. No prices were displayed. The four menus (in Hebrew) appeared in four different orders, shown schematically in Table 1. Call one the Baseline (arbitrarily designated). Then the other three were: Mirror (that reversed the Baseline order completely within each category); Inside-Out Base (that reversed the Baseline order within the top half and within the bottom half of each category, but not the top and bottom halves themselves, thereby turning middle items into extreme items and vice versa); Inside-Out Mirror. Each participant received a single menu, and was asked to choose a single item from each category. They were promised that one participant would be chosen by lottery, the winner to be rewarded with a real meal at the pizzeria, consisting of his or her exact questionnaire choices. The reward was sufficiently motivating that participants volunteered the few minutes needed to make their menu selections.

2.2 Results

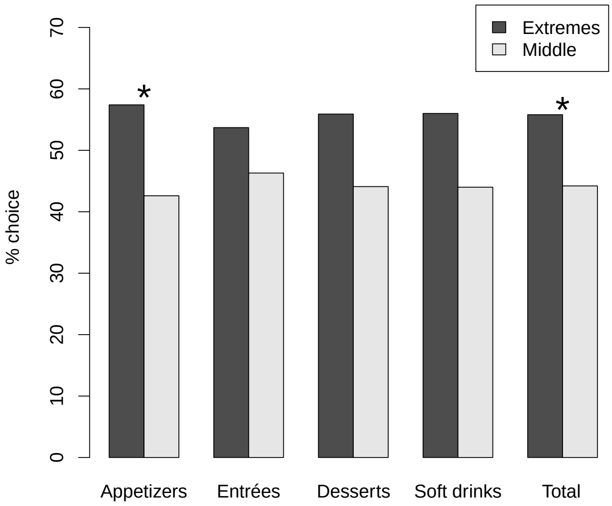
Table 2 shows the popularity of the items (namely, the number of orders they received) as a function of their within-category position. Since we used only four different orders, not all items appeared in all possible positions (excepting the Appetizers). All items did, however, appear both in the top half and in the bottom half of their category offers (this was assured by the Mirror reversals). Additionally, items that were either first or last in their category (A1, A4; E1, E10; S1, S6; D1, D8) always exchanged positions with items in its middle (e.g., A2, A3; E5, E6; S3, S4; D4, D5, respectively). Because all categories had an even number of offerings, this "middle" consisted of 2 items. Among the items that were neither at the extremes nor in the middle, some nonetheless moved closer to, or further from, the middle (as when E2, E9 and D2, D7 exchanged positions with E4, E7 and D3, D6, respectively), but some retained their position vis-à-vis the middle or the extremes in all 4 menu orders (this was the case for E3, E8, S2, and S5). The latter could not provide data for our hypothesis, so although their data are reported in Table 2, they were ignored in the position analyses.

In Table 2, M+ and M- designate the middle positions, where M+ is atop M-; M++ and M-- designate positions just above or just below the middle ones, respectively; PU is the penultimate position.

Since Table 2 gives the data in full, all questions can be answered from it directly. Nonetheless, for reader ease, we prepared another table derived from it. Table 3 omits the hypothesis-irrelevant menu items (E3, E8, S2 and S5). It also omits menu items which were chosen by fewer than 24 (i.e., 10%) of the participants (E1, E2, E4, E5, E6, S4, D1 and D4). This removed 107 observations from the table, which are nonetheless included in all analyses at the category level. Table 3 also converts frequencies to percents, to facilitate between-item comparisons. Finally, item order is rearranged, from the item showing the greatest benefit for an extreme position, D7, to that showing the least benefit for an extreme position, D5 (which, in fact, was the only item that showed a deficit for the extreme position). This is shown in the rightmost column (which sums the percent of choices of the top and bottom items).

All but one item (D5 Carmela) of the 16 individual items in Table 3 (and all but 4 items of the 28 items in Table 2) show that an individual item, no matter how

Figure 1: The mean percent of choices made when an item was on the top or bottom vs. in the middle of its food category, sorted by category type. * indicates p<.05, two tailed.



popular or unpopular, benefits from being placed at the beginning or end of its category list rather than at its middle (2-tailed sign test, p=0.0005 and p=0.0002, respectively). Although the individual items show that advantage to range up to 64%, none was significant. At the category level, the advantage ranged up to 57%, with the Grand Total being a significant 56% overall (p<.001 by 2-tailed sign-test). Even in the category of "unpopular items" (namely those ordered so infrequently that they were left out of Table 3), the advantage was 54%.

The category results are visually displayed in Figure 1.

Although this paper is concerned exclusively with middle-vs.-edges position effects, the data afford an opportunity to check for primacy and recency effects as well. None, however, was found: 50.5% of the choices were for the items at the top half of their category vs. 49.5% for the bottom half. Moreover, the Total percents show a striking symmetry around the middle (see the bottom line of Table 3). Item popularity as a function of distance from the middle was 21%–20% (first vs. last); 7%–7% (second vs. penultimate); 5%–6% (M++ vs. M--); 17%–16% (M+ vs. M-).

These data also show, somewhat surprisingly, that the edge advantage was not larger for first/last position vs. middle than for second/penultimate position vs. near-middle (notice how items of the former and the latter kind interleave throughout the table, which is ordered by the magnitude of the effect). The enhanced popularity of the first/last positions was 55% (out of 674 observations), and that of the second/penultimate positions was 57% (out of

Table 2: Number of orders as a function of item position.

		Number of orders as a function of item position							
Item name	N	1st	2nd	M++	M+	M-	M--	PU	Last
A1 Ensalada Verde	55	14	- [1]	-	11	10	-	-	20
A2 Caprese	101	29	-	-	22	23	-	-	27
A3 Empanada	50	16	-	-	10	12	-	-	12
A4 Colorada	34	7	-	-	7	8	-	-	12
Appetizer total	240	66	-	-	50	53	-	-	71
E1 Cumbia	8	2	-	-	3	2	-	-	1
E2 Milonga	9	-	3	2	-	-	2	2	-
E3 Lambada	47	-	-	12,13 [2]	-	-	10, 12	-	-
E4 Tango	15	-	4	5	-	-	3	3	-
E5 Candombe	14	4	-	-	3	1	-	-	6
E6 Friconne	63	17	-	-	16	15	-	-	15
E7 Samba	24	-	5	8	-	-	4	7	-
E8 Salsa	2	-	-	0, 1	-	-	0,1	-	-
E9 Meringue	28	-	10	6	-	-	6	6	-
E10 Rumba	30	9	-	-	6	7	-	-	8
Entrée total	191 22,27	32	22	21 12,14	28	25	15 10,13	18	30
D1 Cookies ice-cream	21	4	-	-	6	4	-	-	7
D2 Choc-chip ice-cream	24	-	7	5	-	-	6	6	-
D3 Strawberry ice-cream	26	-	7	3	-	-	9	7	-
D4 Cappuccino ice-cream	16	4	-	-	3	4	-	-	5
D5 Carmela	30	6	-	-	8	9	-	-	7
D6 Nicoletta	69	-	22	11	-	-	16	20	-
D7 Chaja	33	-	8	5	-	-	7	13	-
D8 Dulce de Leche ice-cream	21	7	-	-	5	4	-	-	5
Desserts total	240	21	44	24	22	21	38	46	24
S1 Orange Juice	50	18	-	-	12	11	-	-	9
S2 Sprite	5	-	1,1	-	-	-	-	2,1	-
S3 Coca Cola	75	21	-	-	16	14	-	-	24
S4 Fanta	3	0	-	-	1	1	-	-	1
S5 Soda water	2	-	0,0	-	-	-	-	1,1	-
S6 Lemonade	105	34	-	-	24	23	-	-	24
Soft drinks total	233 4,3	73	- 1,1	-	53	49	-	- 3,2	58
Grand total	904 26,30	192	66 1,1	45 13,14	153	148	53 10,13	64 3,2	183

[1] Here (and in the other tables), - occurs in a cell that was not represented by a position.

[2] Double entries in a cell occur when the item appeared in the same position in two different menu orders.

Table 3: Item popularity in percents as a function of item position.

	Item position								
Item name	1st	2nd	M++	M+	M-	M--	PU	Last	% extreme
D7 Chakha	-	24	15	-	-	21	39	-	**64**
A1 Ensalada Verde	25	-	-	20	18	-	-	36	**62**[1]
D6 Nicoletta	-	32	16	-	-	23	29	-	**61**
S3 Coca Cola	28	-	-	21	19	-	-	32	**60**
E9 Meringue	-	36	21	-	-	21	21	-	**57**
E10 Rumba	30	-	-	20	23	-	-	27	**57**
A3 Empanada	32	-	-	20	24	-	-	24	**56**[2]
A4 Colorada	21	-	-	21	24	-	-	35	**56**[2]
A2 Caprese	29	-	-	22	23	-	-	27	**55**
S6 Lemonade	32	-	-	23	22	-	-	23	**55**
D2 Choc-chip ice-cream	-	29	21	-	-	25	25	-	**54**
S1 Orange Juice	36	-	-	24	22	-	-	18	**54**
D3 Strawberry ice-cream	-	27	12	-	-	35	27	-	**54**
E6 Friconne	27	-	-	25	24	-	-	24	**51**
E7 Samba	-	21	33	-	-	17	29	-	**50**
D5 Carmela	20	-	-	27	30	-	-	23	**43**
Appetizer total	28	-	-	21	22	-	-	30	**57 ***
Entrée total	17	12	11	15	13	7.9	9.4	16	**53**
Desserts total	8.8	18	10	9.2	8.8	16	19	10	**56**
Soft drinks total	31	-	-	23	21	-	-	25	**56**
Grand total	21	7.3	5	17	16	5.9	7.1	20	**56***

[1] Here and elsewhere, irregularities in sums (e.g., 25+36=61, but table shows 62) are due merely to rounding errors.
[2] Here, and elsewhere, apparent ties (e.g., between A3 and A4) were broken by the next digit, not shown.
* indicates significance at the .05 level or better, 2-tailed.

228 observations; the difference is not significant).

3 Study 2

Clear and unambiguous as the results of Study 1 are, they are nonetheless hypothetical choices, made—for better or for worse—under controlled, but artificial, conditions. In contrast, Study 2 was run on the real choices of real customers in a Tel Aviv café. The menu, naturally, listed prices (in New Israeli Shekels; see Appendix). The management cooperated with the study manipulations in two respects. First, they agreed, for the study period, to alternate (across days) the usual menu with one identical to it in every respect except for the order of some menu items. Second, they recorded customer orders for our benefit, as detailed below.

The café is a small town-center coffee-shop, open 7 days a week, from 8am till one or two hours after midnight, and catering primarily to students and young professionals. It consists of seven tables and a counter, and offers a wide selection of hot or cold drinks based on coffee, tea, or ice-cream, and served with or without alcohol, as well as a selection of sodas and fresh juices. It also serves desserts such as cakes and ice-cream. There were altogether about 60 listings on the menu, some of which stand for multiple possibilities (e.g., "coffee" can be had in a caffeinated and decaffeinated version; "ice-cream" comes in many flavors; some canned drinks can be had in a diet version; etc.). The study focused on only 3 categories (which appear as such on the menu): Coffee

Table 4: 20 menu items and the number of times they were ordered in two menu versions. A=Alcoholic coffee; S=Soft drinks; D=Desserts.

Base Menu	Freq	I/O menu	Freq
A1 Frangelico Quarto	2	A2	8
A2 Kahlua / Grappa Quarto	3	A1	2
A3 Frangelico Espresso	4	A4	17
A4 Irish Cream	17	A3	5
Alcoholic coffee total	26	-	32
S1 Mineral water	51	S3	78
S2 San Pelegrino	85	S2	87
S3 Coke / Diet Coke	50	S1	45
S4 Sprite / Diet Sprite	41	S6	5
S5 Nut drink	5	S5	8
S6 Passionfruit drink	6	S4	46
Soft drinks total	238	-	269
D1 Croissant	18	D5	35
D2 Brownie	16	D4	24
D3 Coffee cake	29	D3	35
D4 Banana bread	28	D2	11
D5 ried fruit cake	29	D1	9
D6 Cookie platter	20	D10	8
D7 Carrot cake	39	D9	2
D8 Tiramisu	2	D8	4
D9 Chocolate souffle	2	D7	42
D10 Fruit salad	7	D6	26
Desserts total	190	-	196

with alcohol—4 items; Soft drinks—6 items; Desserts—10 items. An exact replica of the menu, translated into English, appears in the Appendix.

During the period of the study, all orders made from these categories were recorded, separately and discreetly, by the waiters. Orders placed without resort to the menu (e.g., by some regular customers) were not recorded.

The study took place in summer, though not on a daily basis. Each form was given on 15 days, alternating, with exactly the same distribution over the days of the week (thus controlling for possible systematic variations in days of the week). The Baseline menu is the café's standard menu. The Inside-Out version changed only the positions of the items in the study's 3 target categories, exchanging items on the two ends of the category with items from the middle of the category, as shown in Table 4.

3.1 Method

Participants. Participants were the self-selected clientele who ordered from the three target categories during the period when observations were collected. We cannot say exactly how many customers were involved, only how many orders were involved (459 from the Base menu, and 492 from the I/O [Inside-Out] menu). Some customers may have ordered more than one item during a single visit, and some may have been repeat customers, but no records were made of these possibilities.

Design, stimuli and procedure. There were two versions of the menu, in which 20 items out of the 60 in the menu differed only in their order within their category (see Table 4). Data were collected with no particular protocol. We are aware that asking the café's waiters (who necessarily were not blind to the manipulation, but were blind to the hypothesis) to record the data is a possible source of noise, adding to the naturally occurring noise from having no control over the customers and their choices. However, it is hard to imagine how any biases, including those that are time sensitive (e.g., more sloppiness at the end of the day, due to waiter fatigue, or less sloppiness at the end of the day, due to waiter "warm up"), might interact with our variable of interest.

3.2 Results

Table 4 lists the categories and item names that were manipulated in Study 2. It shows the two orderings of the menu side-by-side, and the number of times each item was requested during the study period.

Table 5 was derived from Table 4 in the same manner as Table 3 was derived from Table 2. Thus, it does not show the hypothesis-irrelevant items (S2, S5, D3, D8), and it does not show items whose total number of orders over the study period fell under 24 (A1, A2, A3, S6, D9, D10—a total of 56 orders). The latter were nonetheless included in the category-level percents, shown at the bottom of the table, and in all analyses. Frequency of customer orders was replaced by percent of all orders from that category, and items are listed in the table from that showing the most benefit for an extreme location (D1 Croissant), to that showing the least benefit (D4 Banana bread).

Only one item of the 10 items in Table 5 (D4; A4 is tied), and only 2 of the 18 items in Table 4 (D4 and D10; A1, A4 and D8 are tied), show an advantage to a middle position (2-tailed sign test: $p=.04$; $p<.007$, respectively). At the category level, this advantage ranges up to

Table 5: Item popularity in percents as a function of two item positions.

Item	Popularity in percents as a function of item									
	N	1st	2nd	M++	M+	M-	M--	PU	Last	% extreme
D1	27	67	-	-	33	-	-	-	-	**67**
S3	128	61	-	-	39	-	-	-	-	**61 ***
D2	27	-	59	41	-	-	-	-	-	**59**
D6	46	-	-	-	-	43	-	-	57	**57**
D5	64	-	-	-	-	45	-	-	55	**55**
S4	87	-	-	-	-	48	-	-	53	**53**
S1	96	53	-	-	47	-	-	-	-	**53**
D7	81	-	-	-	-	-	48	52	-	**52**
A4	34	-	-	-	-	50	-	-	50	**50**
D4	52	-	46	54	-	-	-	-	-	**46**
A total	58	17	-	-	8.6	36	-	-	38	**55**
S total	322	40	-	-	30	14	-	-	16	**56 ***
D total	316	17	13	12	12	9	13	14	10	**54**
Grand total	696	28	5.7	5.6	20	14	5.9	6.3	15	**55 ***

* indicates significance at the .05 level or better, two-tailed.

56%, with a grand mean of 55%—just a tad lower than the advantage found in Study 1 (56%). At the category level, only Soft drinks was significant. All in all, Study 2 showed much the same advantage to being placed at the beginning or end of a menu category as was shown in Study 1.

In this study, there was a larger gain when an item moved from the exact middle to the extreme end (55%), than when it moved from the near-middle to the near-end (51%; n.s.). Table 5 also seems to show an advantage to being listed in the top half of a category (59% of the choices; p<0.0001, 2-tailed sign test). However, we did not use a Mirror ordering here, so the effect of side is confounded with the nature of the items themselves, and thus cannot be attributed to position. Therefore, there is no point in checking for symmetry in Table 5 as we did in Table 3.

The category results are visually displayed in Figure 2.

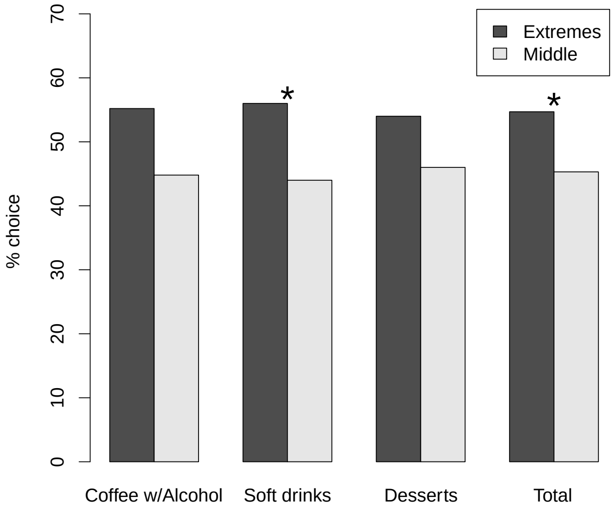
4 Discussion

Menu consultants may be wrong in some of their recommendations (Kincaid & Corsun, 2003; Reynolds, Merritt & Pinckney, 2005), but apparently they are not wrong on the particular one studied here. In two studies, one eliciting hypothetical choices and one observing real choices, we found that placing menu items at the beginning or end of their category increases their popularity by about 20% (namely the gain from 45% of the time when an item appeared in the middle of its category, to 55% of the time when it appeared at one of the ends of its category). This effect depended neither on the kind of foods in the category, nor on its size (4 items, 6 items, 8 items or 10 items—albeit the two were somewhat confounded).

We cannot offer a satisfying explanation for why menu choices would differ from the many other contexts in which different, usually even opposite, biases were found, surveyed in our introduction. Indeed, we found not one single study that showed an advantage to being both first *and* last over being in the middle. We are dismissing, of course, the vast literature on the serial position effect, because "position" there is temporal, not spatial, and the dependent variables are related to memory, not to choice. We must also dismiss the results in our companion paper, although Rozin et al. (2011) also found an edge advantage—placing food items at either side row of a three-row food display, rather than in its middle row, enhanced their popularity. But Rozin et al. had a convincing physical explanation for their results: the items in the middle were physically harder to access, requiring a longer reach under a plastic shield ("Sneeze Guard"). Alas, their account cannot be applied to choice from a menu.

From the other studies of position effects in simultane-

Figure 2: The mean percent of choices made when an item was on the top or bottom vs in the middle of its food category, sorted by category type. * indicates p<.05, two tailed.



ous choice, we shall also put aside those that involve hide-and seek strategies (e.g., Rubinstein, Tversky & Heller, 1986; Attali & Bar-Hillel, 2003), because a menu is certainly not a set of options hiding one "correct" option for the chooser to discover, but rather a display inviting the chooser to suit him- or her-self only. Finally, we shall put aside those where all options are the same but for their position, which is not the case for menus. Of the remaining studies, perhaps the closest is the ballot voting study (Koppell & Steen, 2004), and the two consumer-choice studies (Nisbett & Wilson, 1977; Valenzuela & Raghubir, 2009). Alas, these did not find consistent position effects (the effects found, respectively, were primacy, recency, and "center stage"), and correspondingly, did not offer consistent accounts. Moreover, they also found the literature inconsistent, and offered their accounts speculatively (e.g., Koppell & Steen: "the literature is contradictory, with no clear pattern in the findings across studies", p. 268; Nisbett & Wilson: "Precisely why the position effect occurs is not obvious. It is possible that subjects [were] "shopping around", holding off on choice of early-seen garments on the left in favor of later-seen garments on the right", p. 244; Valenzuela & Raghubir: "prior research examining the effect of physical position of products in an array has found inconsistent effects ([reference list follows]), and is divided as to why position effects occur. … evidence [for offered accounts] … is lacking …", p. 185).

At this time, the topic of position effects in simultaneous choice is far from being well understood (see Bar-Hillel, 2011), and additional research is clearly called for.

Although our results may presently lack an explanation, we believe they are robust enough to warrant confidence, especially with an eye to real-world application rather than theory. We believe that we have presented enough evidence to recommend a nudge: Put the food you want to encourage at the extremes of the menu listings. This recommendation applies to the listings within category; we have not studied whether it is similarly possible to nudge people across category boundaries. If anyone who wishes to adopt this nudge to nobesity remains skeptical—it is ridiculously easy and cheap to test it in their specific context: change menu positions, and see.

Nudges can be used not only to promote healthier food choices, but any other agenda as well (higher earnings; faster turnover for more perishable foods; etc.). It is up to us to nudge to nobesity. Rozin et al. (2011) show in quantitative detail how even negligibly small effects can accumulate over time till they are significant. They also address the various caveats that can be raised against attempts to affect food intake by a single nudge. Their analysis applies to our nudge as well. And, like theirs, it can all be done dirt cheap and with minimal effort.

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Appendix: Replica of menu used in Study 2

Ice Cream

One Scoop	9
Two Scoop	12
Three Scoop	15
Four Scoop	17
T/A half/one kilo	32/61

Classic Italian ice cream , home- made from natural ingredients only. Creams 5% fat, sorbets 0% fat

Cold

Cold choco w/ ice cream	9
Cold coffee*	15
Flavored cold coffee*	15
Cold coffee w/ ice cream*	16
Milkshake	19
Coffee shake- cappuccino ice cream mixed with espresso	15
Cold tea- Lemon & mint, Sangria, Sweet Garden	12
Cold chai	13
Affogato/double Affogato	13/16
Coconut/nut/vanilla milk	13

Mineral water	7
San Pellegrino	9
Coke/Diet Coke	8
Sprite/Diet Sprite	8
Nut drink	12
Passion fruit drink	12

Freshly Squeezed

Oranges/lemonade	12
Red grapefruit	12
With Crème de Cassis	14

Breakfast *till 11:30*

Cappuccino +croissant+ fresh juice	23
Cappuccino +croissant	14

Warm

Espresso*	7
Double espresso*	9
Cappuccino*	9
large cappuccino*	13
Brewed coffee*	9
Cafe au lait*	10
Flavored coffee*	13/15
Hot cocoa	12
Chocolata- thick chocolate	13
Coconut/nut/vanilla milk	10
Cider/cider with brandy	12/16
Chai	10
English tea, Earl Grey tea	9
Aloysia, Jasmine, Sangria, Sweet Garden brews	9

Extras

Alcohol	6
Ice cream	4
Coconut/nut/vanilla flavor	3
Honey	2

Coffee with Alcohol

Frangelico Quarto	13
Kahlua/Grappa	12/15
Frangelico Espresso	15
Irish Cream	14/18

* Can be ordered w/ DeCaf

Butter/chocolate croissant	9
Brownie	10
Yeast cake	13
Banana bread	13
Dried fruit & nuts cake	13
Plate of cookies	12
Carrot cake	18
Tiramisu	24
Chocolate soufflé w/ice cream	23
Fruit salad w/ice cream	16