Research Report

CHOICES FROM IDENTICAL OPTIONS

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Abstract—*Many of the decisions that people must make involve selections from arrays of identical options. The six studies presented explored people's preferences in two contexts: choosing one item from rows of identical items and choosing a route from a series of identical routes. The first three studies examined preferences for items in particular positions. Whether people were choosing a product from a grocery shelf, deciding which bathroom stall to use, or marking a box on a questionnaire, they avoided the ends and tended to make their selection from the middle. For example, when there were four rows of a product in the supermarket, only 29% of the purchases were from the first and last rows, and 71% were from the middle two. The last three studies examined whether a similar preference exists in picking a route when all of the available routes are the same length and require the same number of turns. In solving mazes, planning routes on maps, and walking around campus, people showed the pattern opposite to that found for choosing items in rows: They avoided the middle routes and tended to take either the first or the last one. Overall, the last available route was the favorite. The notion that these behaviors may minimize mental effort is explored.*

People, throughout their lives, face a vast array of tough choices. They must pick spouses, careers, homes, cars, outfits, and entrées. A great deal of attention has been devoted to this whole spectrum of choices, investigating how people maximize utility (Bentham, 1825), examining the role of attitudes (Rajecki, 1990), and documenting deviations from optimality (Kahneman, Slovic, & Tversky, 1982).

There are, however, types of choices

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very different from these gut-wrenching dilemmas. Sometimes people select an item or course of action from a set of alternatives not only without another thought but also apparently without any thought at all. Although people can make choices without thinking about them in a variety of settings, one likely candidate, and the one that is investigated here, is when the alternatives are actually identical. For example, shoppers decide which can of tomato soup to buy, callers decide which phone booth to use, and writers decide which pencil to select without anything depending on these decisions. These are the kinds of decisions that the makers may not even realize they have made.

The research on automaticity suggests that there is a wide range of things that people can do without conscious involvement (Posner & Snyder, 1975). Levelt (1989) has suggested that much of speech is produced without deliberation. The Stroop task is based on the fact that people seeing a word will read it automatically even if they try not to. Schank and Abelson's script theory (1977) and Langer's mindlessness (Langer, Blank, & Chanowitz, 1978) argue that a great deal of normal social interaction takes place without much conscious thought. This report examines whether there are systematic patterns in people's unthinking preferences.

Much of the work on choices without consequences has focused on the *blue-seven phenomenon*. The fact that people asked to pick a number tend to choose seven and asked to name their favorite color will come up with blue was noted by Simon (1971) and has since been extended to other countries (Philbrick, 1976), other ages (Simon & Primavera, 1972), and other genders (Silver et al., 1988). However, both colors and numbers are imbued with layers of significance that make interpreting these preferences very difficult. For example, blue being a favorite color could simply be a function of people's fondness for sunny days or ocean views, and the finding that few people pick zero (0.7% in the study

by Silver et al.) may well be based on the connotations of that number. In both color and number choices, the alternatives are not equal. This report, in a series of six studies, examines choices between alternatives that do not have any values or connotations.

STUDY 1: SUPERMARKETS

Method

Popular items in supermarkets are often stocked in multiple rows, giving shoppers a choice of a number of identical items side by side, all equally within reach. We can measure preferences for particular positions by counting how many times shoppers take items from each row.

Four supermarkets in southern California were selected for this study. From each market, an assistant chose 10 items that were stocked in at least three adjacent rows. For 14 days, she recorded whether or not an item had been taken from each of the rows for each of the items under observation.

It is the nature of supermarket stockers to replace quickly any items that shoppers take from the shelves, so our data indicate whether a shopper had removed an item since the last restocking. It is the nature of shoppers to take items only from the front of a shelf. If a shopper buys the product from one row, the next shopper will not take the next item back from that row, but will instead pick from a different row. This tendency means that if two shoppers intervened between the stocker's visit and ours, the second shopper might have had to settle for his or her second-favorite row. This would slightly dilute any systematic preference that shoppers have for particular rows, but otherwise should not bias the data.

Results

Preferences for left versus right are hard to interpret because they can be a

function of which way customers tend to travel through each aisle or of the side of the aisle on which the product is stocked. Central-versus-end decisions do not suffer from such potential biases, and the data show a strong preference between these alternatives. For 37 of the 40 products, shoppers showed a preference for selecting the items from middle rows, and avoiding the items in either the first or the last row. The choices are significantly different from a random distribution of item preferences, $p < .0001$. For example, over the 14 days of the study, we recorded that 12 boxes of crackers had been removed from the four rows of that brand in one of the supermarkets. If people picked randomly, then 6 of these boxes should have been from Rows 1 and 4, and 6 should have been from Rows 2 and 3. Instead, only 3 had been taken from the ends, and 9 from the middle rows. Table 1 summarizes the findings for the 40 items. Regardless of the number of rows, from three to eight, people avoided the ends and chose their items from a middle row.

It is possible that the supermarket data do not indicate an automatic preference for middle items, but instead reflect a dislike of stale products. If shoppers realize that the central rows turn over faster, then they would be wise to pick their products from these rows to maximize freshness. Although it is not likely that people are eager to get the freshest possible dog food, this may be a general rule that shoppers apply to all their purchases. This strategy would be effective if enough people believe it to be so.

Whether people pick the middle rows because they are automatically drawn to them or because this is a clever shopping habit can be examined by recording behavior in a situation where there is no issue of freshness. One such situation is use of public restrooms.

STUDY 2: RESTROOMS

Method

A public restroom at a California state beach was used for this study. The men's room had four identically sized stalls, and each stall had four identical toilet paper dispensers. The stalls were side by side, with Stall A closest to the door. The toilet paper dispensers were lined up in a horizontal row on the occupant's right.

The custodian was recruited to record which rolls needed replacing once per week for 10 weeks. This information provided two tests of people's preferences: We could examine whether users had a preference for middle or end stalls based on the total number of rolls used in each stall, and we could also look for a preference for middle or end dispensers within each stall.

Results

People's preference for middle items was apparent for both stall selection and roll selection. Overall, of the 86 rolls that were finished, 34 (40%) were from the two end stalls, significantly fewer than expected by chance, $p < .05$. Within stalls, 33 (38%) finished rolls came from the end dispensers, again fewer than expected by chance, $p < .05$. As with the earlier position preference in the selection of products in the supermarket, the patrons in beach restrooms avoided the ends. Both the choice of stalls and the choice of rolls within the stalls were biased toward the ones in the middle. These data are displayed in Table 2.

With the supermarket data, it is possible to imagine that a desire for freshness created the preference for the middle, and with the bathroom data, one might imagine that minor differences in convenience influenced the choices. The third study presented subjects with choices that were exactly identical except for their positions in the array.

STUDY 3: POSITION PREFERENCES

Method

In this study, 220 undergraduate subjects were given a single-page questionnaire asking them to put an x in one circle in a row of three circles or to circle one x from a row of four xs.

Results

The data are shown in Table 3. In both cases, people avoided the ends and made their choices from the middle alternatives.

DISCUSSION

The preference for central items applies to picking items off a supermarket shelf, to choosing a bathroom stall, to choosing a roll of toilet paper within a stall, and to picking from a row of arbitrary symbols. The stability of the behavior over these diverse situations suggests that the preference for the middle option is genuine. Although it is possible to imagine alternate explanations for

Table 1. *Number of times supermarket shoppers chose an item from each row stocked, broken down by how many rows of that item were displayed*

Row from which item was chosen	Number of rows stocked					
	3	4	5	6	7	8
1	65	44	5	11	4	2
2	147	83	4	15	9	5
3	71	75	10	15	6	3
4		22	6	8	4	2
5			6	11	3	3
6				10	3	3
7					1	3
8						2
Number of products	20	13	2	3	1	1
Percentage of choices from end rows	48	29	35	30	17	17
Expected percentage of choices from end rows	67	50	40	33	29	25

Identical Options

Table 2. *Number of times out of 10 days that toilet paper rolls needed replacing for four stalls and four dispensers within each stall in a public restroom*

Stall	Dispenser				Total percentage
	1	2	3	4	
A	5	7	4	3	22
B	5	9	9	4	31
C	5	6	8	6	29
D	2	6	4	3	17
Total percentage	20	33	29	19	100

Note. Stall letters (A–D) refer to the order of the stalls, and dispenser numbers (1–4) refer to the order of the dispensers within each stall.

some of these findings, one needs to invent a different sort of explanation for each one. The most parsimonious approach is that these behaviors reflect a general implicit rule that people use to make these frequent decisions.

One possible reason for selecting the middle option is that it allows one to complete the task with the least thought. If shoppers are busy thinking about their next purchases or their screaming children, then aiming for the middle box of cereal minimizes the chance that they will end up with the brand that is stocked next to their favored breakfast fare. The notion that the preference for the middle is a product of minimizing mental effort suggests that for certain sorts of choices people would not prefer the central options. That is, in some cases thinking can be minimized by selecting one of the end options and avoiding the middle. One class of situations in which this might be true is navigation, either through a maze, on a map, or in the real world. People are often confronted with a number of possible routes that are identical in distance,

time, number of turns, convenience, and the like, and they must pick one.

One important difference between navigational choices and the sorts of decisions in the first three studies is that the various possible routes are not offered all at once, but instead are presented in a sequence. People deciding which cross street to travel do not have all of the possible routes available at once, but must come upon them one at a time, and must decide not so much which option to take but when to act. Minimizing mental effort in such a situation may not be best accomplished by taking a middle route.

With navigational decisions, there are two possible strategies for minimizing mental effort. People must have in mind at some point that they need to make a turn. If they have this in mind from the start, then they can make the first available turn, and then forget this piece of information. This technique would lead people to take the first route most often. The other strategy is to avoid thinking about the need to turn until it is neces-

sary to do so. That is, people might simply walk straight until that is no longer possible. In this case, they would take the last available option. The least efficient strategy is to keep in mind that a turn is necessary and not take the first one.

The hypothesis that people make their decision from identical alternatives in such a way as to minimize mental effort, and the suggestion that this should lead to an avoidance of middle options in navigation, is clearly speculative. However, it is quite straightforward to collect data on navigational choices. The next three studies examine route preferences for mazes, maps, and actual travel.

STUDY 4: MAZE ROUTES

Method

In this study, 312 undergraduate subjects were given a sheet of paper with a simple maze drawn on it. Each maze had only one area where any decision needed to be made. In this area, the subject had a choice of a number of possible routes that all led to the same point, were the same length, and involved the same number of turns. The number of such possible identical routes was either 3, 4, 8, or 10. An example of one such maze, with three options, is presented in Figure 1.

Results

The number of times subjects picked each route was tabulated for each maze, and these numbers are presented in Table 4. For all four mazes, the first and last alternatives were chosen significantly more often than they would be if people decided randomly which route to take (all $ps < .0001$).

Table 3. *Number of people picking each alternative from an array of three or four identical items*

Choice	Items in array	
	Three circles	Four xs
1	10	37
2	23	85
3	9	42
4		14
Percentage of choices from end rows	45	29
Expected percentage of choices from end rows	66	50
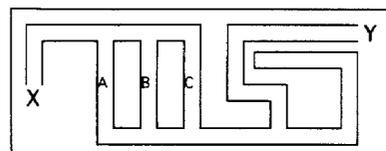
Fig. 1. Maze with three identical options. The three choices (A, B, and C) have the same number of turns, are the same length, and are equally direct.

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Table 4. *Number of people choosing each route when solving mazes with varying numbers of identical options*

Route chosen	Number of options			
	3	4	8	10
1	46	37	11	5
2	0	5	1	0
3	54	8	0	0
4		52	0	0
5			2	0
6			1	1
7			2	0
8			69	0
9				3
10				15
Total	100	102	86	24
Percentage of choices from end rows	100	87	93	83
Expected percentage of choices from end rows	67	50	25	20

Note. Numbering of the routes reflects the order in which the options became available in the mazes. For example, Route 1 is the first possible turn, and Route 2 is the second possible turn.

In addition to the overwhelming preference for the first and last options, one other pattern is present, though more faintly, in these data. For all four mazes, the subjects preferred the last route over the first one. This preference is significant for two of the four, borderline for one, and far from significant for the fourth, though even in that case the trend is in the right direction. In order to explore the generality of these two patterns, we asked another group of subjects to indicate their preferred routes on a map of a real city.

STUDY 5: MAPS

Method

A map of El Centro, California, was chosen for this experiment because the city is laid out with a grid design, which made it easy to find cases in which alternate routes between two locations are the same length, involve the same number of turns, and are in every detectable way equally convenient. A photocopied map was given to 157 subjects, who were instructed to indicate the route they would take between the high school, marked with an X, and the pizzeria, marked with a star. Half of the subjects were told to start at the X and end at the star, and half were told to begin at the star and end at the X.

The route between the pizzeria and the high school involves one choice where there are three identical cross streets. These cross streets run parallel to each other, are indicated on the map with equally dark and thick lines, and give no signs of being one-way streets, congested, or deficient in scenic beauty, or having any other undesirable characteristic.

Results

Of the 157 people who indicated the route they would take through El Centro, not a single one selected the middle option. This avoidance of the middle

route was complete regardless of which way the subjects traveled through the city. This distribution of routes is very different from random choice among the three streets, $p < .0001$.

The other pattern that was present in the maze data is also visible with these data. People preferred the last available route over the first one. It is clear that this preference was not due to anything intrinsic to the streets because the preferred street depended on which way the subject was traveling, $\chi^2 = 4.00, df = 1, p < .05$. The subjects who were traveling east to west preferred to take Olive, which was the third cross street they came to. However, the west-to-east subjects tended to pass up Olive and wait until Orange to cross over. The streets chosen are shown in Table 5. The fact that the preferred route depended on the direction the traveler was heading in suggests an explanation for why many people find themselves taking different routes to and from frequent destinations.

It is worth examining whether the preferences in hypothetical navigational situations extend to actual decisions that people make. It is possible that when people actually drive through El Centro, they do sometimes take Brighton instead of Orange or Olive or take the first available cross street more often than the last.

STUDY 6: REAL-WORLD NAVIGATION

Method

Two navigational dilemmas on a college campus were selected for this study.

Table 5. *Number of people choosing each route on a map of El Centro*

Cross street chosen	Direction of travel	
	East to west	West to east
Orange	31	47
Brighton	0	0
Olive	44	35
Total	75	82

Note. For people traveling east to west, Orange is the first available cross street, Brighton is the second, and Olive is the last. For people traveling west to east, the order is reversed.

Identical Options

In both places, pedestrians are faced with a choice of routes that are equally long and require the same number of turns to get to the destination. The basic physical structure of the two dilemmas is shown in Figure 2. Dilemma 1 involves deciding where to cross a parking lot. Pedestrians enter at one corner and exit at the diametrically opposite one. Cars park in two rows, permitting three possible routes. People can turn immediately, wait a little while and turn between the two rows of cars, or turn after they have reached the far side of the parking lot. The routes are all essentially identical with the exception of where people choose to make their turn. All three routes across the parking lot require two right-angle turns, the surface is uniform and level, and no route is particularly scenic. Because cars park in rows, diagonal routes would require squeezing between cars, and were never chosen.

In Dilemma 2, people come down a footpath that runs perpendicular to a road, turn and walk parallel to the road for about 100 feet, and then head off on another perpendicular path. The choice that they face is at what point to make that turn. They can turn immediately and walk down the side of the street on which they started, or they can wait to turn until after they have crossed the street. In this particular instance, there is a sidewalk only on the south side of the road, and people who walk along the north side must walk either in the gutter or along the sloping dirt margin of the road. If people care about this difference, then the north-to-south walkers should wait to make their turn until after they have crossed the street, and the people going the other way should make their turn immediately. If people prefer not to walk in the gutter, they should all take Route C, as drawn in Figure 2.

The street-crossing choices are slightly different from the options in the other navigational dilemmas discussed so far. People who choose a middle route in this case will travel the same distance as early and late crossers, but they will have to make four turns instead of two. For this reason, it is hard to evaluate avoidance of the middle route. However, the preference for the first versus the last option can be examined.

Diagonal routes were not feasible for Dilemma 1, and people also tended not to pick diagonal routes in Dilemma 2, probably to minimize the potential for getting run over. However, if people did take a diagonal shortcut, then they were grouped in the middle category (Route B), even if they started their turn immediately. This coding procedure was designed to minimize any possibility of underestimating the preference for middle routes. The experimenter spent several afternoons recording the routes pedestrians took and in which direction they were traveling. A total of 221 people were observed traveling through the first location, and 55 through the second.

Results

In both places, people preferred to walk straight until they had to make a turn. For the first dilemma, 23% of the pedestrians took the first option, 25% crossed at an intermediate point, and 52% waited until the last moment. The routes taken are shown in Table 6. The pedestrians preferred to turn at the last possible opportunity even though this did not save any time, reduce the number of turns they had to make, or reduce the overall effort. Once again, it is clear that the preference was for the last option, not for any actual path, because the preferred route depended on the direction in which people were traveling. The preference reversal is highly significant, $\chi^2 = 24.7$, $df = 2$, $p < .0001$.

In the second dilemma, 15% of the pedestrians made their turn at the first available point, 27% turned at an intermediate point, and 58% waited until the end. The route taken again depended significantly on the direction of travel, $\chi^2 = 16.8$, $df = 2$, $p < .0005$. Most people were even willing to walk in the gutter on the north side of the street in order to satisfy their inclination to turn at the last opportunity.

The clearest pattern from these two dilemmas is people's preference for the last available route. Avoidance of the middle route, a clear pattern in the studies of hypothetical navigational decisions, is harder to evaluate in this study. For the parking lot crossing, 25% took the middle route, whereas 33% should have taken it by chance, $p < .01$. However, a similar percentage took the first option, so the effect is probably more a desire for the last route than an avoidance of the middle.
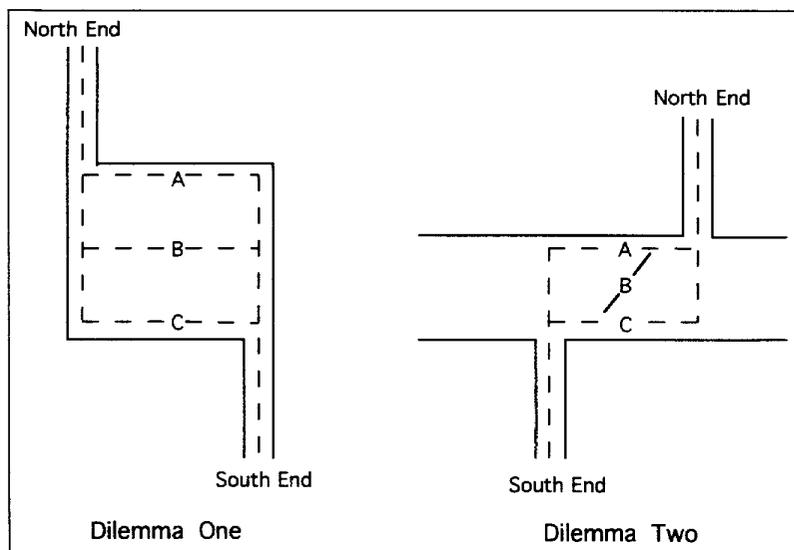

Fig. 2. The physical structure of the two dilemmas for which pedestrians' choices among three possible routes (marked A, B, and C) were observed. The first dilemma involved deciding where to cut across a parking lot, and the second whether to turn before or after crossing a street.

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Table 6. *Number of pedestrians choosing each path through two navigational dilemmas*

Route chosen	Dilemma 1		Dilemma 2	
	North to south	South to north	North to south	South to north
A	20	53	0	20
B	29	27	6	9
C	61	31	12	8
Total	110	111	18	37

Note. Route C is the last route encountered when traveling north to south, and the first when traveling south to north.

GENERAL DISCUSSION

These findings indicate that a substantial number of people do have implicit rules for deciding which option to choose when there is no objective basis for making a choice. The data show not only that most people have such a rule, but also that the rule is widely shared. If people had rules, but they were entirely idiosyncratic, then no patterns would have emerged.

People choosing from an array of identical options reliably prefer the middle ones, and avoid the extremes. This pattern seems to be true for supermarket selections, for restroom and toilet paper choices, and for choices of arbitrary symbols on a questionnaire. A different, though equally stable, pattern emerges when people choose a route from some number of equal options. Indicating a path through a maze, planning a route on a map, or walking through a college campus, people seem to prefer the end routes, rather than the middle one, and show a special fondness for the last available route. Because these kinds of choices are often made without any real thought, it is quite likely that the preferences reflect implicit rules. It is possible (as suggested earlier), though quite speculative, that minimizing mental effort is the common principle. Aiming for the middle of a group may require less concentration than going for the extremes,

and not worrying about where to turn until one has to turn may keep one's mind clear of unnecessary information.

Although the findings probably do not explain much variance in important decisions about which people consciously deliberate, there are several possible domains where the results might be applied usefully. Supermarket shoppers who do not now take items from the middle rows should do so, especially for products with a finite shelf life; supermarket stockers should put their almost-spoiled items in the middle rows because they are likely to sell more rapidly from those positions.

The travel preferences should also be taken into account by urban planners. In designing one-way streets, they should take care that the last cross street leading to a popular destination runs in the right direction. Another possible application is ensuring that end routes have a greater capacity than the middle ones. These results are also consistent with Nisbett and Wilson's (1977) observation that subjects unknowingly prefer the last item in a sequentially presented display of clothes, which suggests that the preference for the last item may generalize beyond navigational decisions.

Thomas (1974) devoted one of his essays to expressing gratitude that his liver takes care of the endless stream of hepatic decisions without consulting him. Similar thanks are probably also due to

whatever takes care of the constant series of petty decisions that must be made but that have no real consequences. It is hard enough deciding what cereal to buy without deciding which particular box, and hard enough deciding where to go without deciding exactly how to get there.

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