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LOCATION, LOCATION, LOCATION: POSITION EFFECTS IN CHOICE AMONG SIMULTANEOUSLY PRESENTED OPTIONS

By

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CHAPTER 20

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Location, location, location:

Position effects in choice among simultaneously presented options

Introduction

Location, location, location

An old and widely held adage (attributed to Lord Harold Samuel) states that in real estate, only three things matter: location, location and location. Knowing chuckles aside, this statement is clearly false. Location trades off readily with other properties, or we would not see people – even those who can afford the locations of their choice – living as far and wide as they do, and moving from desirable locations to less desirable ones (even in their own opinion) that offer more space, better schools, etc. The adage may be taken to mean that while properties deteriorate with time and neglect, or appreciate with care and investment, their location is fixed (hence the French term -- *immobilier*). Still, even that is not as immutable as it sounds, because today's desirable location may become tomorrow's undesirable location. It is hard, however, to find fault with the more inane statement that *other things being equal*, one should choose real estate according to its location.[1]

While it may be hard to specify exactly what "other things equal" means when choosing properties, one can imagine a new high-rise building selling identical apartments that differ only in their location within the building: sides and floors. Nowadays, it is unlikely to find these apartments selling for the same price, because the partly-shared preferences for certain locations that create greater demand for some apartments are reflected in the asking price, and so "other things are not equal" even in this example. But elsewhere it is still possible to find objects for sale that are equal in every sense, including – in spite of predictable variance in demand – price, such that location is indeed the sole determinant of preference. For example, most airlines still charge the same for a window seat, an aisle seat, and a middle seat, although

[1] Nonetheless, location is not relevant in *all* contexts, as we shall see later.

the latter is least in demand. Likewise, while some theaters (e.g., the Metropolitan Opera) charge more for aisle seats, typically entire rows of seats sell for the same price, though some seats are clearly better. The price of dinner out also depends only on what one ordered, not on the table at which one was seated (ignoring establishments where one tips the maitre'd upon arrival).

Picking versus choosing

Another famous adage states that one cannot step into the same river twice. This, it turns out, is meant to cast doubt on the casual and uncritical use of "same" in everyday language. Some sources say that Heraclitus' went on to say "for other waters are continually flowing in", and some even add: "for it's not the same river and one is not the same person". This adage has been introduced into this chapter because it questions the assumption underlying some of our earlier examples, that any two things can ever be "otherwise equal", or "the same", or "identical". This philosophical point notwithstanding, Ullmann-Margalit[2] and Morgenbesser (1977) proposed that selecting among "identical" objects (the prototype of which are soup cans in the supermarket) is a selection task which is special enough to merit its own name. They suggested the term "picking" for selection with symmetrical preferences, or selection without reason, or selection among identicals. While Ullmann-Margalit and Morgenbesser did not discuss location per se as a distinguishing feature of otherwise identical objects, they explicitly rule out situations where physical convenience determines the selection (e.g., one soup can is on an accessible shelf and the other is too high up, or one can faces the customer and the other is hidden behind it). Convenience provides a good reason for choice; picking is done without reason.

Ullmann-Margalit and Morgenbesser did not address the empirical or psychological question of how people *in fact* pick, but rather analyzed the conceptual question whether picking is even possible -- or whether the very fact that people select in what appears to be a picking situation is evidence that the situation all along was one of choice, not of picking. They assert that picking situations do exist, and are even commonplace, and that they do not result in the impasse of Buridan's ass, dying of hunger whilst trying to pick between two identical and equidistant piles of hay. People can, and do, pick. Rescher (1960) proposed that an easy way to extricate oneself from impasse is by adopting a policy such as "When

[2] Edna Ullmann-Margalit was a close friend, and died suddenly last year, too young. I wish to dedicate this chapter to her memory.

confronted with a choice in the face of symmetric knowledge, or preference, always to select the first-mentioned (etc.) alternative" (p. 170). Be the practical merits of this policy what they are, Ullmann-Margalit and Morgenbesser contend that adopting it does not dispose of the conceptual problem of picking (e.g., "why", they ask, "the first-mentioned rather than the [last]-mentioned alternative?" (p. 770) – adopting *that* policy is itself a pick).

Position effects in choice.

As psychologists we should consider that certain position biases (e.g., "go for the first") may be a matter neither of selection nor of policy, but rather result from unconscious and non-deliberate psychological processes. The difference is nicely exemplified in a serendipitous finding of Nisbett and Wilson (1977), who set out to show that people cannot rely on introspection to report accurately on the causes of their own behavior if these causes are not plausible. Store customers "were invited to evaluate … four identical pairs of nylon stockings … to say which … was the best quality and … why they had chosen the article they had. There was a pronounced left-to-right position effect, with the right-most stockings being preferred over the left-most by a factor of almost four to one." (p. 243). However, "when asked directly about a possible effect of the position of the article, virtually all subjects denied it, usually with a worried glance at the interviewer suggesting that they felt either that they had misunderstood the question or were dealing with a madman." (p. 244). In Nisbett and Wilson's interpretation, position *caused* the choice, but it is so implausible a cause that it cannot provide a *reason* for the choice.

The same variable that made Nisbett and Wilson's respondents suspect their interlocutor's sanity (i.e., position) is nowadays widely used to affect consumer choice -- albeit not regarding an article's position on a rack, but rather the positioning of the entire rack. Regarding some locations, commonsense suffices to see their advantage, as when placing items near the checkout counter, where they are likely to catch the attention of the people waiting to pay (publishers will pay bookstores handsomely to have their books displayed there). Other locations' status may be culturally determined, as when people believe that certain items or people have been placed in certain locations for a reason (think "corner office"). Google's algorithm for ordering search results is a trade secret, but is anything but random or arbitrary. In a consumer context, Valenzuela and Raghubir (2009) proposed that "consumers believe that options placed in the center of a simultaneously presented array are the most popular" (p. 185). This was supported by their data. In a quiz context, Pattee (2009)

asked the people scoring the quizzes where they thought the "correct" answers lay in the 3-choice teenage girls' magazine quizzes they were coding. She found "… a tendency to select answer "b", while the [coders] selecting "incorrect" responses tended to choose item answer "a" or "c", but not "b" " (p. 201-202). Their intuition was in fact correct.

Position has been a variable of interest in experimental psychology from the beginning of its history. The serial position effect has been studied in thousands of experiments, and is described by a U-shaped function, with the first and last positions enjoying a memory related advantage over the middle positions. However, "serial position" here means temporal, not spatial, seriality. Studies in which the dependent variable is choice rather than memory are fewer and more recent. In some, items are presented sequentially, and so are subject to the serial position effect even if the dependent variable is not a memory measure. But this chapter focuses on studies where the items for choice are presented simultaneously, and are all still present when the choice or evaluation are rendered. So "position" means "location".

How location affects choice – the empirical evidence

When studying the serial position effect on memory, it is not possible to use identical items in each serial position (which was one of the reasons for the early adoption of nonsense syllables in memory studies, since they were regarded as equivalent, for all practical purposes). In contrast, when studying position effects in choice, it is certainly possible to place identical items (Heraclitus notwithstanding) in different positions, as was done when Nisbett and Wilson placed 4 pairs of identical stockings in a row. But the effect of position on choice can also be studied with different choice items, provided proper control is exercised to assure that position is not confounded with other factors. Finally, positions can themselves be objects of choice, as when a floor planner decides where to locate the staircase, the water cooler, or the lighting fixture. Position effects in choice have been studied using all these paradigms, as we shall now see.

A. Choosing among positions.

A task most clearly falls within this paradigm if the task actually requires choosing a position. Christenfeld (1995) gave respondents just such a task: "to put an x in one circle in a row of three circles or to circle one x from a row of 4 xs. … In both cases, people avoided the ends and made their choices from the middle alternatives" (p. 51) – 55% and 71% of the times, respectively. Later, Shaw et al. (2000) found that among their respondents, "68% chose

the middle item from a set of three highlighters and three surveys, … 71% selected the middle chair from a row of three chairs that were either all empty, or had a backpack occupying either one of the two end chairs" (p. 157).

Falk, Falk and Ayton (2009) designed the most ambitious study within this paradigm. Basically, respondents were given a 5 x 5 grid, and asked to mark a single cell. The results were clear and decidedly non-uniform: "participants avoided marginal locations [namely, the 18 cells on the border of the grid] and preferred more central cells" (p. 212). Moreover, of the 9 central cells, "as a rule, C3, D4 and B4 [namely, the dead-center and the two cells just above it on the diagonal] were most favored" (p. 212). What makes their results truly remarkable is that this summary holds true under 7 very different sets of instructions given to 7 sets of respondents. These, roughly speaking, were: Indefinite instructions: just "mark X in a cell"; Randomization instructions: "put X in a cell chosen as if blindly"; Competitive instructions: "hide X in a cell (to make it hard to find)"; or "find the cell in which X was hidden"; Cooperative instructions: "put X in a cell where you want it to be found"; or "find the cell meant for you to find"; Aesthetic instructions: "mark X in some cell to create a pleasing pattern". There were some differences in the 7 distributions obtained (e.g., C3 was most popular in the aesthetic instructions and least popular in the competitive-hiding instructions) – but not such that the above summary does not hold for them all!

More remarkable still is that essentially the same results were found when the same 7 sets of instructions requested that three cells, not just one, be marked. Again there were some differences (e.g., the unpopular 4 corner cells were quite popular under the cooperative instructions) – but C3, B4 and D4 were still the most popular cells (in different rank order for different instructions), and the remaining border cells were unpopular under all instructions.

This study is the most comprehensive demonstration of "edge aversion", and shows its robustness under varying strategic considerations: when asked to choose a location for any purpose or none, central cells are more popular than border cells.

Rubinstein, Tversky and Heller (1996) gave their respondents a similar, but one-dimensional, task: to "hide" or to "seek" a "treasure" in one of four linearly ordered locations. "Hiders" were paid $10 if the "Seekers" failed to find the treasure, and "Seekers" were paid $10 if they found it. 72% of 53 hiders and 63% of 62 seekers chose one of the two middle positions. As in Falk et al's study, respondents exhibited edge aversion: the two central positions were more popular choices than the two edges.

Rubinstein et al's study was messy – respondents participated in all 6 tasks (over which the results above are pooled), and the four locations had other differences among them (not described here). Attali and Bar-Hillel (2003) ran a cleaner study. Their respondents were asked to invent, on the topic of their choice, a single multiple-choice question to which they themselves knew the answer; then to invent three distractors; and finally to write down the question and the four answers on a preprepared empty form on which space was designated for the question and the 4 answers. Unbeknownst to the respondents, where they chose to position the correct answer was the only variable of interest. Of 190 respondents, 131 (69%) put it in the two middle slots (an even stronger middle bias was reported by Berg and Rapoport, 1954). The result is particularly notable considering how natural and easy it would have been for the respondents to write the correct answer in position A, because it presumably existed in their mind prior to inventing the three distractors; yet only 20% did so.

Other respondents were more explicitly asked to choose a position. They were asked a 4-choice question (e.g., "What is the capital of Norway?") which was followed by 4 wordless positions A, B, C and D. Of 196 guesses, 78% circled positions B and C.

B. Position effects in choice with symmetrical preferences or none.

In this paradigm, people are actually picking, not choosing, and its finest examples are "Choices from identical options" (the title of Christenfeld, 1995). Much in the spirit of Ullmann-Margalit and Morgenbesser, Christenfeld's first study involved identical items stocked on a supermarket shelf. 40 items were recorded, stocked side-by-side between 3 and up to 8 in a row. In all 6 ranges, the items on the two edges were chosen less often (by between 10% and 70%) than would have been expected by chance. In Christenfeld's second study, a public bathroom with 4 side-by-side stalls was observed. Each stall had 4 toilet paper dispensers lined up in it. 60% of the toilet paper rolls that were used up during the observation period were from the two middle stalls, and a similar percent was used up from the middle rolls within the stalls. Taken together, these results (like Falk et al's) foil any strategic explanation. Clearly, if one believes that others have edge aversion for supermarket items, one should follow suit – because the middle rows would be freshly stocked more often. However, if one believes that others have edge aversion for bathroom stalls, one should prefer the edges oneself, because those would be the cleaner stalls. So although the former bias can be self-maintaining, the latter should not. But they share a preference for the middle over the edges.

In contrast, recall that Nisbett and Wilson's found that "last is best".

Picking is required not only when choice options are identical, but also when the apparent reasons for choosing them are symmetrical. Three studies come to mind.

i. *Predicting the outcome of a numerical lottery*.[3] Participants were asked to guess what number would come up in a random draw of one of 12 tickets marked from 1 to 12. "While the draw itself was purely random, the guesses were clearly not. … the four central values (5, 6, 7, 8) [were] the most popular ones … chosen by 58.9% of the subjects" (Teigen, 1983, p. 14). Summing up the other studies as well, Teigen says: "[respondents] tend to choose central, "representative" values, and avoid extreme ones" (p. 13). Although numbers, not positions, were chosen here, numbers have a natural order, and hence occupy natural positions. In addition, they were written on a blackboard, where they occupied spatial positions.

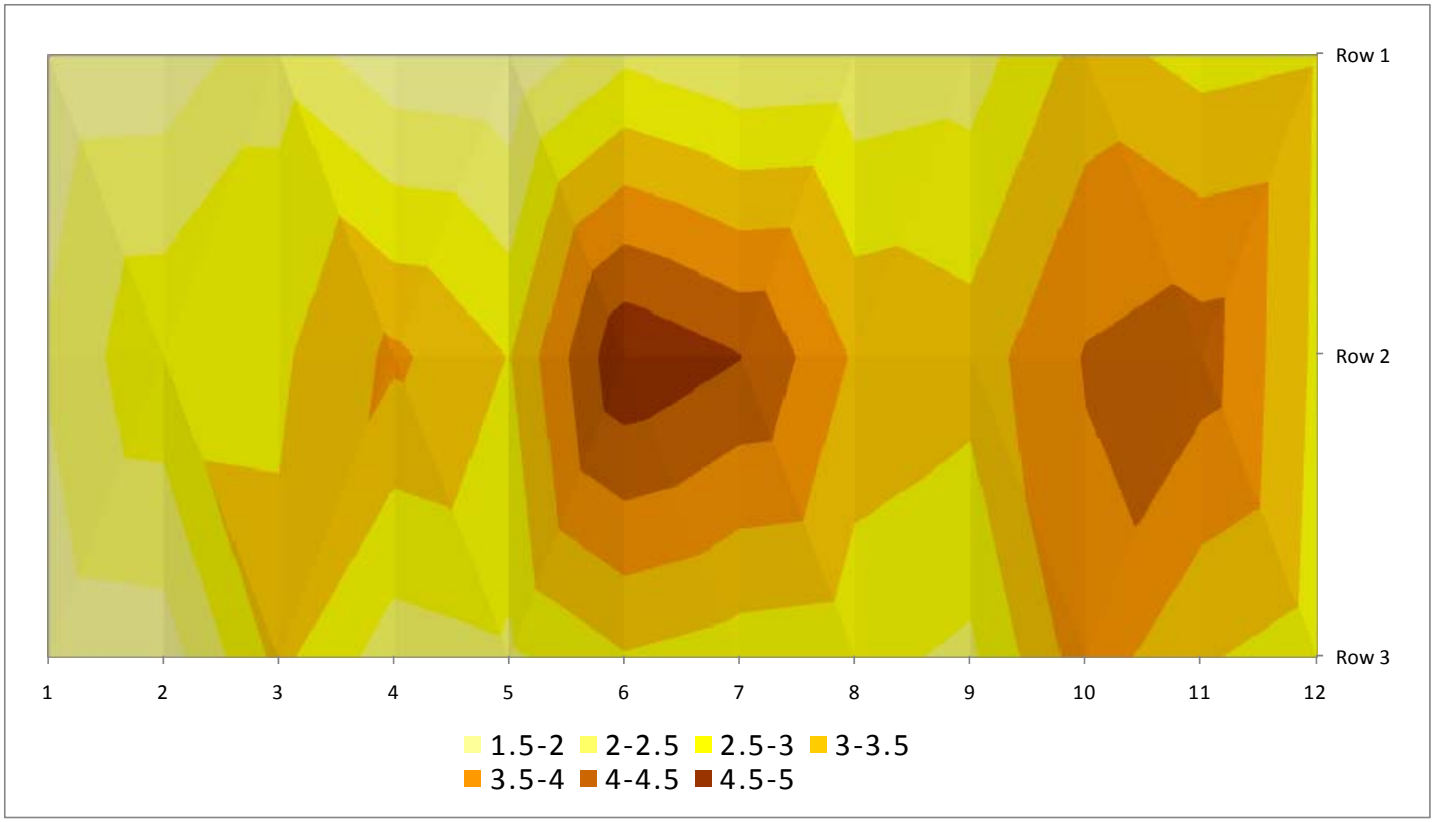
ii. *Betting on a roulette wheel*. A roulette wheel also uses numbers -- from 1 to 36. On the wheel, the numbers are not arranged in their natural order, and the circular arrangement precludes classifying positions as "central" or "extreme". But bets are placed on a 3-by-12 matrix drawn on a green felt base, in a natural order from left to right: 1-2-3; 4-5-6; …; 34-35-36. Thus the 10 numbers 5, 8, 11, 14, 17, 20, 23, 26, 29, 32 are in the center (namely, flanked on all sides by other numbers), and the other 26 numbers are on the edges. Sundali and Croson (2006) collected data on roulette gambling in a real casino, and reported their raw data in their Table 1. Had they arranged that table like the roulette table, they surely would not have failed to notice the evidence for edge aversion. The 2 most popular positions were numbers 17 and 20, in the very center of the matrix (there is no single dead-center number because the number of rows is even). On average, each of the 10 central positions got over 40% more bets than each of the 26 edge positions (3.6% vs. 2.5%). The data in their entirety are displayed in Figure 1, imposed on the betting table.

Figure 1 – Percent of bets placed on each of 36 numbers in real casino betting

(data from Sundali & Croson, 2006, Table 1) [4].

[3] I am particularly pleased to report on this task, because it was studied by Karl Halvor Teigen.

[4] Thanks to Ro'i Zultan for this figure



C. Position effects in choice with preferences

If in picking situations middle bias is manifested by greater popularity of the middle items compared to the edge items, in regular choice situations one needs to compare two different presentation orders of the same choice set, and middle bias would be manifested by greater popularity for an item when placed in the middle of the choice options than when placed on their edge.

i. *Guessing in real test-taking*. Attali and Bar-Hillel (2003) did just this with examinees taking real tests, with real answers, and non-uniform answer popularities. "… one group of examinees receives questions with the answers in positions A, B, C, and D, and another group gets the same questions with the same answers but reordered into positions B, A, D, and C. … If guessing test-takers are edge averse, more examinees would choose options B and C in the first presentation than in the second, while A and D would be more popular in the second version . … We focused on wrong answers on the general assumption that these are mostly

guessed answers. … nearly 30% more examinees chose a wrong option when it was presented in a middle position." (p. 119-120).

ii. *Restaurant menu orders*. Dayan and Bar-Hillel (2011) set out to explore whether a similar bias exists in ordering from menus. The trade literature in menu design suggests the opposite (e.g., Main, 1998; Panitz, 2000) – but is not based on research (and when some accepted truths were tested, yielded null results; Kincaid and Corsun, 2003). So which is it?

We employed the same methodology as in the previous section, namely offering customers two versions of the same menu that differ only in where item order. To our surprise, our results showed a clear and robust advantage to menu items when placed either at the beginning or end of a menu list, as compared with their popularity when placed in its middle. This advantage was found in a hypothetical study, with forced choices from each of four categories (appetizers, entrees, deserts and drinks) as well as in a field study in a real café. In both cases it was found for all food categories, which differed in their length as well as their content.

iii. *Ballot voting*. Ballots are sometimes designed like a menu, offering voters an ordered list of candidates. Koppell and Steen (2004) analyzed data that was almost like a controlled study, inasmuch as "the order of candidates' names was rotated by precinct" (p. 267), a systematic and deliberate policy in that jurisdiction (New York City). Since "each office is listed first in a nearly equal number of small precincts [t]his procedure produces observational data that is as close to experimental as one can get without actually randomizing the assignment of ballot formats" (p. 270). Alas, name-order is still confounded with precinct, and we are not told whether precincts are similar enough to provide a natural experiment. Koppell and Steen found that "candidates received a greater proportion of the vote when listed first than when listed in any other position". This was as they predicted based on Krosnick's (e.g., Miller & Krosnick, 1998) theory: "[I]f choices are presented visually, as in an election ballot, the first option presented is most accessible and a "primacy effect" is expected" (p. 270).

So this one paradigm yielded three different position effects: edge aversion (multiple-choice tests); edge advantage (restaurant menus); primacy effect (ballots).

Edge aversion or edge advantage? Primacy or recency?

The serial position effect in learning and memory is consistent, robust, and well understood. The same cannot be said for position effects in choice. Even just the two studies

in which I was directly involved – multiple-choice testing and restaurants menus -- yielded different results. This in spite of the fact that on some level, two particular experiments in these two studies were as close as one can hope for: choice from among 4 options which appear in writing and are chosen by marking.

To be sure, there are differences between these two tasks, too. One elicits knowledge and the other elicits tastes. One is often experienced as "hard", and the other is usually done with ease. Tests are stressful, menu choices rarely so. Etc. But note that the traditional serial position effect is robust under far greater differences. And edge aversion was found (as described in this chapter) in a multitude of tasks, differing in how many options were offered (from 3 to 36 – but the literature also looks at binary choices); the manner in which they were displayed (in writing, in a physical layout); the substantive content (food, answers, lotteries, bathrooms, consumer goods, etc.); the manner in which choice was made (verbally, physically), etc. Edge aversion was also found when it – or any position bias -- would be advantageous, or disadvantageous, or neutral.

It would have been quite wonderful if we could have summarized the situation as: In making choices from simultaneously presented, and present, options, being at the edges (or margins, or ends, or boundaries, or extremes, as the case warrants) reduces the likelihood of choice. In other words, it would have been elegant to say that in temporal sequential presentations, items suffer from being in the middle, whereas in spatial simultaneous presentations, items benefit from being in the middle. Alas, while approximately true, this is not really the case. Experiments which should have yielded similar effects yielded different ones, and experiments which should have yielded different effects yielded similar ones. Moreover, the choice contexts are so different, that it is unlikely to find a single explanation accounting for them all. Even the meaning of "first", "last", "middle" differs in different contexts.

There are other studies of position effects in choice that I have not hitherto mentioned, for two main reasons.

First, I didn't include studies in which positions differed by more than mere location. For example, Christenfeld (1995), alongside his findings of edge aversion in supermarket purchases and in public bathroom use mentioned above, found an edge advantage in other studies. Specifically, he showed that people choosing a path to take them from one corner to another which is one block to its east and 4 blocks to its south, prefer to walk south as far as

they can before turning east rather than take one of the earlier turns east (the maps, both schematic and real, that his respondents saw held the number of turns constant).[5] I don't believe this to be a position effect per se, any more than the preference for a window or aisle seat on planes is a mere position effect (remember: a "mere position effect" is one where the position does not provide a reason to choose it). Likewise, I did not include the many studies about response biases in rating scales, especially Likert scales (e.g., Extreme Response Style and Central Tendency Bias), again because the scale positions differ by more than location alone (e.g., by extremity).

Second, I didn't include studies in which "position" referred to temporal rather than spatial position, of which there are quite a few. However, these too have found inconsistent results (although none to my knowledge have found an advantage to being in the middle). For examples, de Bruin (2005; 2006) found an advantage to being last; Carney and Banaji (2008) and Dean (1980) found an advantage to being first; Li and Epley (2009) found an interaction effect: items (e.g., paintings, candy) which are "good" benefit from being last while "bad" items benefit from being first.

Notably, and typically, when discussing the two different patterns he found, Christenfeld offered no real explanation: "It is possible … though quite speculative, that minimizing mental effort is the common principle" (p. 55). He did not say how choosing a central bathroom stall minimizes mental effort. Nisbett and Wilson (1977) were likewise taciturn: "Precisely why the position effect occurs is not obvious. It is possible that subjects carried into the judgment task the consumer's habit of "shopping around", holding off on choice of early-seen garments on the left in favor of later-seen garments on the right" (p. 244). Dayan and Bar-Hillel (2011) did not even speculate on an account for their results – but could adopt neither Christenfeld's nor Nisbett and Wilson's speculations, if for no other reason than that we found a different position effect.

The only account that comes close to being satisfactory is that in situations that seem to call for random placing of options, either because they are directly related to lotteries, or because of game-theoretic considerations (Attali and Bar-Hillel, 2003; Falk et al, 2009; Rubinstein et al, 1996; Sundali and Croson, 2004; Teigen, 1983), the notion of "representativeness" (Kahneman & Tversky, 1972) explains why the target item is placed, or

[5] This is a recasting of the stimuli and wording Christenfeld used, but will do for present purposes.

believed to be placed, away from the edges. The middle is more representative of a random process, much like some statistical measure of central tendency or another is usually the best representative of an entire distribution. This account was first and best proposed by Karl Teigen. Alas, it does not explain the middle's advantage in other studies (e.g., Christenfeld, 1995; Valenzuela & Raghubir, 2009).

The absence of consistent results or systematic explanations is by no means a dead end. Some speculative accounts can certainly be studied, with other experiments, other manipulations, other dependent variables (e.g., reaction times), even other equipment (e.g., eye-tracking devices), designed specifically not to discover the position effects, but afterwards -- to understand them. While we focused on simultaneous presentation, experience necessarily unfolds sequentially, so process models from sequential position effects will no doubt play an important role in explaining location effects as well. Until such a time, it is my sad realization that if asked to predict the outcome of a new study of position effects in a new setting, all I have done and read might be of little help in predicting them.

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