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Does Presentation Order Impact Choice After Delay?

Jonah Berger

The Wharton School, University of Pennsylvania

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Abstract

Options are often presented incidentally in a sequence, but does serial position impact choice after delay, and if so, how? We address this question in a consequential real-world choice domain. Using 25 years of citation data, and a unique identification strategy, we examine the relationship between article order (i.e., position in a journal issue) and citation count. Results indicate that mere serial position affects the prominence that research achieves: Earlier-listed articles receive more citations. Furthermore, our identification strategy allows us to cast doubt on alternative explanations (i.e., editorial placement) and instead indicate that the effect is driven by psychological processes of attention and memory. These findings deepen the understanding of how presentation order impacts choice, suggest that subtle presentation factors can bias an important scientific metric, and shed light on how psychological processes shape collective outcomes.

Keywords: Order effects; Choice; Citations; Collective outcomes

1. Introduction

People are often exposed to a sequence of options, only to make a choice at some later time. High school students browse lists of colleges weeks or months before they decide where to apply. Renters usually peruse lists of available options weeks before they actually decide which apartments to go see. And people scan restaurant menus online days before they actually end up eating at the restaurant.

Correspondence should be sent to Jonah Berger, Wharton School, University of Pennsylvania, 700 Jon M. Huntsman Hall, 3730 Walnut Street, Philadelphia, PA 19104. E-mail: jberger@wharton.upenn.edu

Might such happenstance exposure influence later choices? Could mere presentation order influence what colleges, apartments, or entrées people select later on, even in situations where choice is made long after initial exposure? And if so, which sequence positions benefit?

Order effects have been examined across a variety of literatures (Becker, 1954; Berg, Filipello, Hinreiner, & Sawyer, 1955; Miller & Krosnick, 1998), but existing work has focused on situations where (a) processing is motivated, (b) choice (or evaluation) is immediate, and (c) only one choice is possible. People are asked to select their favorite option from a set of possibilities (e.g., Mantonakis, Rodero, Lesschaeve, & Hastie, 2009) or to remember information from a long list (Glanzer & Cunitz, 1966). But what about the preponderance of real-life situations where consumers have no motivated reason to study the options, or just happen to browse them out of interest? And where people can select more than one option? Does presentation order influence choice after delay? And if so, how?

This paper examines how order effects influence choice after delay, even in a situation where exposure to the information may be more casual than motivated. Using 25 years of citation data, and a unique identification strategy, we examine whether the order in which articles appear in a journal issue influences the number of citations they receive. The results deepen the understanding of order effects on choice, and along the way, shed light on how psychological processes shape collective outcomes.

2. Effects of serial position on choice

Some research suggests that there are primacy effects on choice, or benefits to being first or early in a sequence (Becker, 1954; Berg et al., 1955; Miller & Krosnick, 1998). When consumers are asked to taste and pick their favorite beer from a set of four, for example, the first option tends to be chosen more often (Coney, 1977). Similarly, taste testers tended to prefer the first food option they tried (Dean, 1980).

Other work, however, has found recency effects, or benefits from being later or last in a sequence (De Bruin, 2005; Houston, Sherman, & Baker, 1989; Li & Epley, 2009; Mantonakis et al., 2009; Wilson & Nisbett, 1978). When choosing between pairs of stockings, consumers tended to prefer the option that came last (Wilson & Nisbett, 1978). Similarly, when choosing items from a set of good paintings, participants tended to choose the last item in the set (Li & Epley, 2009).

Overall then, while some studies have examined how location in a sequence influences choice, it remains unclear which position is most advantageous (see Li & Epley, 2009; Mantonakis et al., 2009, for potential moderators).

In addition, there has been little attention to how serial position might affect choice after delay. Existing research has focused on situations where choice directly follows exposure to the options. People tasted food, examined stockings, or listened to songs and then immediately made a choice. In many real-world situations, however, there is a substantial delay between exposure and choice. Consumers may read movie listings or scan

travel blogs, only to make their actual decisions weeks or months later. Might the order in which options are presented impact choice after delay, and if so, how?

There has also been little attention to whether serial position effects occur in situations where people browse through lists without an explicit choice goal in mind (e.g., pick the best). Existing research has focused on cases where judges and participants knew they would be exposed to a set of options and would have to make a choice at the end of the set. This likely led them to carefully process the different options and examine each in the sequence (see Mantonakis et al., 2009). But while consumers sometimes actively scan information in the service of a choice they are about to make, other times they may just happen across that information without any explicit choice goal or along the way to do something else. People may come across a bestseller list without any explicit plan of buying a book, for example, yet presentation order might still impact what book they end up buying in the future. What happens when people just happen to be exposed to sequential information, and may or may not need to remember it or ever make a decision about it ever again?

Finally, what about situations where choice is not required or multiple options may be chosen? Prior work has focused on cases where participants are asked to choose only one option from the sequence. They are asked to pick their favorite beer, song, or stocking from the available set, but in many real-world situations, choice is optional. Students may scan a list of courses without having to pick one or browse the electronics aisle without any specific plan to buy. In other cases, people may even end up selecting multiple options. Might serial position effect choice in such situations, and if so, how?

3. The current research

This paper examines whether the order in which items appear in a sequence impacts choice after delay, even in situations where exposure is more incidental than motivated, and choice is not required.

In particular, we suggest that items which appear earlier (e.g., first) should be more likely to be chosen (i.e., primacy effects). We predict this for a number of reasons. First, especially in situations where exposure is casual, earlier items are more visible (Dietrich, 2008a,b; Haque & Ginsparg, 2009) and thus more likely to be seen. Most people start at the top of lists, for example, meaning that earlier items should be more salient and receive more attention (Diehl & Zauberman, 2005; Salganik, 2007). Indeed, there is some evidence that earlier articles are more likely to be read (Haque & Ginsparg, 2009), which should lead to more citations. Second, position may also impact what is remembered. The serial position curve is one of the most studied results in memory (e.g., Murdock, 1960), and due to less proactive interference (i.e., interference from earlier processed information), and other factors, items presented earlier in lists are more likely to be remembered, particularly after delay (Glanzer & Cunitz, 1966). Taken together, this suggests that earlier items should be chosen more often.[1]

4. A field test

To study this question, we examined whether the order in which articles appear in a journal impacts the number of citations they receive. Could mere article order influence impact?

Article order is a particularly good domain to examine because (a) items are displayed in a sequence but (b) people are not required to process all options, (c) choice is optional, and (d) selection tends to occur after delay. Articles are published in a particular order in a journal issue, and most journals have a table of contents listing the articles in the order they appear (e.g., on the cover, as well as online). Readers can expose themselves to whichever articles they want and they are not required to cite any articles upon initial exposure (or ever). Furthermore, while researchers certainly seek out particular articles to cite at a given point in time, most situations where article order could have an effect occur after a delay (i.e., people see an article when it is released and then cite it months or years later). We predict that articles that appear earlier (e.g., first) will receive more citations.

Given the importance of citations, they are a particularly interesting domain to examine. Citations are the foremost yardstick by which scientific research is measured. They are used to determine everything from hiring and tenure to society membership, grant funding, and journal prestige (Diamond, 1986; Endler, Rushton, & Roediger, 1978; Garfield, 1999; Hargens & Schuman, 1990; Seglen, 1997). Underlying this pervasive usage is the assumption that citations are an unbiased measure of scholarship (Goodall, 2006; Hamermesh, Johnson, & Weisbrod, 1982; Smart & Waldfogel, 1996) and provide "an objective measure of [article] quality" (Hamermesh & Schmidt, 2003, p. 400).[2]

Given they are perceived as unbiased, examining citations provides a particularly strong test of order effects. Furthermore, given that papers can only be cited if they relate to a particular topic, one could argue they should not be influenced by simple context type effects. Consequently, if mere presentation order influences citation count, it would underscore the strength of presentation order on choice.

5. Method

Our approach uses a unique identification strategy to disentangle order effects from alternative explanations. One could argue that journal editors assess quality a priori, and place better articles earlier (Smart & Waldfogel, 1996; Stremersch et al., 2007; Van Dalen & Henkens, 2001). Alternatively, even if this is not actually the case, if readers think this is true, they might believe earlier articles are better quality and cite them more. Consequently, any observed relationship between article order and citations could be due to editorial placement or reader perception rather than primacy effects.

To disentangle these possibilities, we collected data from a journal (*Journal of Personality and Social Psychology*—JPSP) that is divided into three independently

edited sections, alphabetically ordered by research area (i.e., Attitudes and Social Cognition, Interpersonal Relations and Group Processes, and Personality Processes and Individual Differences, see Fig. 1). Accepted articles are published separately by section. Consequently, while individual editors determine article order in their section, articles that lead off the first section should be more visible because they are the lead article in the overall journal issue.

These independently edited sections allow us to scrutinize the link between order and citations. If earlier articles in a section get more citations solely because editors place better articles earlier, or because people assume earlier articles are better, then the relationship between article position and citations should be similar across sections (i.e., a main effect whereby earlier articles in a section are cited more). In contrast, if the citation boost for first articles in a section is greatest for the first section (i.e., a section by article order interaction), it suggests something beyond mere editorial placement, or reader lay theories, is at play. The first article in the first section leads off the issue and should be most likely to be salient, seen, and remembered, even by readers that tend to read articles from other sections. Thus, examining the *interaction* of article order and section sheds light on the drivers behind any observed effects.[3]

Said another way, the strongest evidence for a causal primacy effect would be a large effect in the first section and weaker, or nonexistent primacy effects in the second and third sections. These latter two sections should be as susceptible to editorial placement or lay theories as the first section (indeed we show evidence for equivalent editorial placement in the ancillary analyses section below). However, earlier articles in the first section, particularly the first article in that section, should benefit from greater attention. Readers should be more likely to see them when looking at the table of contents, or when opening an issue. Readers from each section often cite articles from other sections (areas of psychology are interrelated),[4] and thus this greater attention (and potentially retrieval) should lead to a boost in citations.

We collected citation counts for all regular JPSP articles published from 1980 to 2005 (almost 5,000 articles) using Institute for Scientific Information's Web of Science citation index. We also recorded article position, both overall and within section. Because certain sections may just generally receive more citations, we include section fixed effects. We also control for the number of articles in a particular section in each issue (since it could impact the attention a given article receives), and since older articles have had longer to accumulate citations, we control for time using year fixed effects. Given citations are a form of count data and are known to be heavy-tailed with lots of zeros, analysis was performed using a negative binomial regression.[5]

6. Results

First, we examined the relationship between article order in the entire journal and citations (Fig. 2). There is a negative relationship between article order and position such that earlier articles received more citations (Table 1, model 1: $b = -0.017$, $SE = 0.003$,

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Attitudes and Social Cognition

Interpersonal Relations and Group Processes

Personality Processes and Individual Differences

(*contents continue*)

Fig. 1. Example of *JPSP*'s independently edited and contiguously appearing sections.

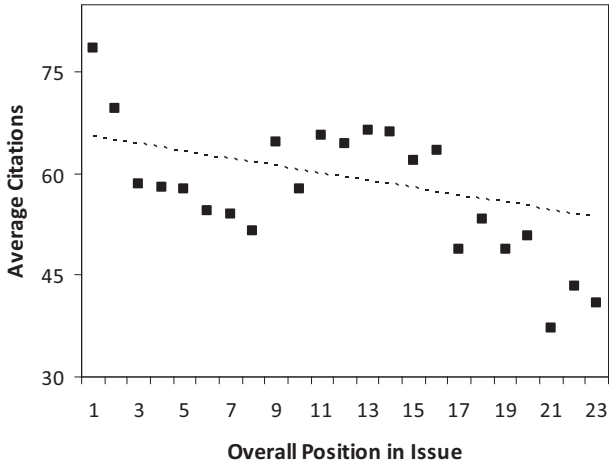

Fig. 2. Articles that appear earlier in the journal are cited more. For display purposes only positions for which there were more than 20 articles over the 25 year period are plotted. As would be expected, there are more observations for earlier than later positions.

$p < .001$). While far from conclusive, this provides preliminary evidence of primacy effects.

Second, to provide a stronger test of whether presentation order is actually leading articles to be cited more, we examine how the relationship between article order and citations varies across the different sections (Fig. 3). As expected, articles that appeared earlier in any section generally received more citations (Table 1, model 2, $b = -0.064$, $SE = 0.017$, $p < .001$). But more important, testing the section by order within section interaction shows that this relationship is stronger in the lead section compared to either the second ("Position x Second Section" coefficient, $b = 0.096$, $SE = 0.027$, $p < .001$) or third sections ("Position × Third section" coefficient, $b = 0.029$, $SE = 0.017$, $p < .10$). For example, while the first article in the first section received an average of 17 more cites than other articles in that section (i.e., $M_{First} = 79$ vs. $M_{Rest} = 62$), this boost was greatly muted in the second ($M_{First} = 54$ vs. $M_{Rest} = 51$) and third sections ($M_{First} = 62$ vs. $M_{Rest} = 60$).

This pattern suggests that serial position has a primacy effect on choice after delay and casts doubt on alternative explanations for the effect. While one could argue that (a) editors place better articles earlier within a section, or that (b) people assume that earlier articles with a section are better quality, these main effect explanations have trouble explaining the interactive pattern of results, or why the relationship between article order and citations differs *across* sections. We not only find a citation boost for appearing earlier in a section, we also find that the boost is greatest for articles in the first section, which are the ones that should benefit most from primacy effects. Furthermore, while it is possible that (c) articles from certain sections (e.g., Attitudes and Social Cognition) may be cited more frequently, we explicitly controlled for this possibility, so it cannot be driving the observed effects.

Table 1
Regression model predicting citations

	Year Dummies			Continuous Time	
	Model 1	Model 2	Model 3	Model 4	Model 5
Primary predictor variables					
Position in the issue	−0.017***				
	(0.003)				
Position in any section		−0.064***		−0.052***	
		(0.017)		(0.016)	
Position × second section		0.096***		0.106***	
		(0.027)		(0.027)	
Position × third section		0.029^		0.017	
		(0.017)		(0.017)	
First article in any section			0.304***		0.295***
			(0.066)		(0.066)
First article × second section			−0.364***		−0.395***
			(0.095)		(0.094)
First article × third section			−0.194*		−0.176*
			(0.091)		(0.091)
Section controls					
Second section dummy (IRGP)		−0.431***	−0.086^	−0.440***	−0.056
		(0.084)	(0.048)	(0.084)	(0.047)
Third section dummy (PPID)		−0.038	0.094*	−0.012	0.075^
		(0.069)	(0.047)	(0.067)	(0.045)
No. of articles in the section		−0.015*	−0.030***	−0.014*	−0.027***
		(0.007)	(0.006)	(0.008)	(0.005)
Year dummies	X	X	X		
Years since publication				0.010***	0.010***
				(0.001)	(0.001)
Years squared				−0.000***	−0.000***
				(0.000)	(0.000)
Observations	4,957	4,957	4,957	4,957	4,957

Note. The table presents unstandardized regression coefficients with standard errors in parentheses. Position is rank ordered, so higher numbers are articles that appeared later in an issue or section.
^$p < 0.1$, *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

6.1. Ancillary analyses

Ancillary tests further rule out alternative explanations. First, we contacted all living section editors from the period studied and asked what, if any, strategies they used when placing accepted articles during their editorial tenure. The most common response was ordering articles by order of acceptance. There was no difference in reported strategies across sections, and editors of the first section did not report using article quality to determine position any more than editors of the other sections. More important, we still find an effect of article order on citation count even among the subset of editors who report

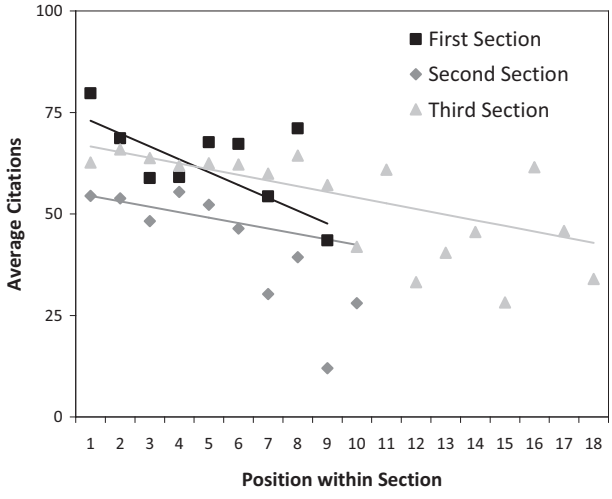

Fig. 3. The citation boost for appearing earlier in a section is stronger for the first section of the journal. Within each section, as would be expected, there are many more observations for earlier than later positions.

using order of acceptance. The fact that article order is linked to citation count even in cases where editors explicitly noted they did not order articles by quality casts strong doubt on editorial placement as an alternative explanation.[6]

Second, we looked at the pattern of effects over time. The shift toward electronic databases and reading articles online has changed how people access science (Evans, 2008; Kurtz et al., 2005). Readers often follow hyperlinks and may find articles without ever seeing what order they appeared in the journal. This provides yet another opportunity to tease apart primacy effects from potential alternative explanations. If the relationship between article order and citations is driven by editors placing better articles first, then it should not matter whether people find articles through reading the journal or electronic databases. Earlier articles would be of higher quality and get cited more regardless. If primacy effects are at work, however, they may weaken with reliance on online databases because fewer people actually peruse the journal and thus the benefits of where articles appear in the journal should be reduced. To examine time dynamics, we interacted position in overall the journal with years since publication to model 1.

Consistent with primacy effects, and inconsistent with editorial placement, there is a significant negative interaction ($b = -0.004$, $SE = 0.000$, $p < .001$), suggesting that the relationship between article order and citations was stronger previously than it is now. This result casts further doubt on the notion that editorial placement or readers' perception of article quality is driving the effect, as there is no reason to believe that these potential drivers should change over time.

6.2. Robustness checks

To avoid assumptions about the linearity of the relationship between article order and citations, we compared the first article in each section with the rest of the articles in that section, across sections.

Results were similar to the main analyses. For example, the first article in the first section received an average of 79 cites (SE = 3.90), whereas the rest of the articles in that section received an average of only 62 cites (SE = 2.07). In contrast, while the first article in the second section (M = 54.18, SE = 3.88) and third section (M = 62.19, SE = 3.92) did receive more cites than other articles in their sections (M = 51.15, SE = 2.35 and M = 59.79, SE = 1.48, respectively), the boost was much smaller.

More rigorous analysis (Table 1, model 3) shows that the first article in any section generally received more citations than the rest of the articles in that section (b = 0.304, SE = .066, $p < .001$). More important, the citation boost for being first in a section was greater in the lead section compared to either the second ("first article × second section" coefficient, $b = -0.364$, SE = 0.095, $p < .001$) or third sections ("first article × third section" coefficient, $b = -0.194$, SE = 0.091, $p < .03$). This pattern further supports the notion that primacy effects influence choice after delay.

Results are also robust to alternate ways of controlling for time. The main analyses used year fixed effects to avoid imposing any assumptions on the relationship between time and citations, but time can also be captured by the number of years that have passed since publication. Including time in this fashion, however, as well as time-squared to allow for nonlinearity, reveals similar results (Table 1, Models 4–5).

6.2.1. Recency effects?

We also examined whether the data showed any evidence of recency effects. First we looked at position in the overall journal. We examined how citations varied based on whether an article appeared last in the journal, second to last, third to last, etc. There was no evidence, however, that appearing later led articles to get more citations. If anything, however, articles that appeared later in the journal actually received *fewer* citations (b = 0.015, SE = 0.003, $p < .001$). The last article in the journal, for example, received fewer citations then the second to last article (M_{last} = 38.81 vs. $M_{\text{2nd to last}}$ = 49.49).

We also looked at position in each individual section, examining how citations varied based on whether an article appeared last in any section, second to last, third to last, etc. Again, however, there was little evidence of recency effects. First, looking across sections found that the last article in a section received slightly fewer citations than the second to last article (M_{last} = 53.03 vs. $M_{\text{2nd to last}}$ = 56.99; p = .15). Second, looking at each section individually found similar results. The last article in a section did not receive significantly more citations than the second to last article in any of the three sections (first section: M_{last} = 55.08 vs. $M_{\text{2nd to last}}$ = 61.09, $p > .20$; second section: M_{last} = 52.66 vs. $M_{\text{2nd to last}}$ = 49.57, $p > .47$; or third section: M_{last} = 52.82 vs. $M_{\text{2nd to last}}$ = 61.60, $p > .09$).

7. General discussion

Analysis of a consequential real-world domain suggests that mere presentation order impacts choice after delay, even in situations where exposure is more incidental than motivated and choice is not required. Articles that appeared earlier in a journal issue, or earlier in a topical section of a journal, were cited more frequently. Importantly, this relationship varied across sections. The citation boost for appearing early in a section was strongest for articles that appeared at the front of the journal, which be more salient (and thus be more likely to be browsed or read) and given having been looked at, more likely to be remembered.

The results cast doubt on the assumption that citations simply reflect article quality, and that the relationship between article order and citations is solely due to editorial placement. If editors merely placed the best articles first, then articles which appeared earlier in a given section might receive more citations, but this pattern should be similar for the section that appears first in the journal as well as ones that appear later. This was not the case. While articles which appeared earlier in a section generally received more citations, this relationship varied across topical sections. Articles which appeared earlier in the first section of the journal were cited more frequently.

These findings are particularly noteworthy given the seemingly objective nature of the choice domain studied. Citations are often seen as an unbiased measure of scholarship and used to determine everything from hiring to tenure. Our results, however, indicate that the prominence research achieves can be shaped by the mere order in which articles happen to appear in the journal. Readers browse through journals from the beginning and most journals include a sequentially listed table of contents. As a result, psychological processes of attention and memory should lead earlier articles to be cited more.

7.1. Contributions and implications

These findings shed light on how presentation order affects choice. Most work has looked at immediate choice when participants are exposed to all the options and required to choose. Our findings, however, indicate that these effects can be even broader. Even when individuals are not required to choose, and choice occurs after delay, the mere order in which options happened to appear originally can impact choice.

We may have observed primacy effects, rather than recency effects, for a number of reasons. Items at the top of lists generally receive more attention, but this should be exacerbated in low-motivation situations where people are not required to choose at the end of the sequence. People may get bored on their way through the list and thus may not process all the items. This suggests that list length may play an important role. In cases where many items are listed (e.g., more than 10), people may decide not to process all the items and thus earlier items may get more attention. But when only two or three items are presented, all may be examined and thus primacy effects may be reduced. This

would be a fruitful area for further research. Earlier items also have lower proactive interference, which should increase the likelihood they are remembered.

These findings have a number of important implications. First, if presentation order influences even seemingly objective domains like academic research, it should have even larger effects in areas where choice is more malleable. Some products appear first on websites while others appear later, and bestseller and most emailed lists provide an ordered listing of books, music, and news. Research has shown that appearance on bestseller lists can increase sales by acting like advertising (Sorensen, 2007), but similar sales increases should come from *where* products appear on those lists. While such lists may originally reflect quality by measuring demand, once posted, they should also influence it. Products that appear earlier should see a greater sales boost.

Second, these findings suggest that factors which influence attention during exposure to a sequence of options should also impact downstream choice. More items in the set, for example, should decrease the attention any one items receives, and thus the likelihood it is chosen. This detriment may be particularly strong for later items in the sequence because they may not even be examined.

Third, the results contribute to the literature on the drivers and consequences of article impact (Monastersky, 2005; Seglen, 1997; Stremersch et al., 2007). This literature has studied important issues such as discrimination in the publication process (Oswald, 2008; Smart & Waldfogel, 1996), but given that article order may not only reflect quality but also affect it, serial position should be carefully considered in analyses.

Fourth, the findings have important implications for scientific stakeholders. From a journal management perspective, article ordering should be carefully considered. Placing articles in order of acceptance, or randomly, may provide the fairest solution. More broadly, given the high stakes associated with citations, everyone would benefit from greater awareness that they may reflect more than article quality. Controlling for other potential factors, such as article order, may provide a more accurate picture of research contribution.

Finally, these findings contribute to understanding how psychological processes shape collective outcomes (Berger, Bradlow, Braunstein, & Zhang, 2012; Berger & Heath, 2008; Berger & Le M., 2009; Berger & Milkman, 2012; Gureckis & Goldstone, 2009; Heath, Bell, & Sternberg, 2001; Kashima, 2000; Schaller & Crandall, 2004; Schaller, Conway, & Tanchuk, 2002). In this case, processes of attention and memory likely shaped the overall prominence research achieved. Similar processes likely happen in other domains. Books, for example, may be ranked higher on the best seller list because they are "high quality" (e.g., better written or on a more broadly relevant topic), but the position in which they appear should also impact their future performance (Salganik, 2007). Earlier positions should benefit from primacy effects and thus sell more copies in the future.

In conclusion, these shed light on how presentation order affects choice. Most work has looked at how serial position impacts immediate choice when participants are exposed to all the options and required to choose. Our findings, however, indicate that serial position has even broader effects. Even when individuals are not required to choose, and choice occurs after delay, the mere order in which options happened to appear originally can

impact choice. More broadly, if presentation order influences even seemingly objective domains like academic research, it should have even larger effects in other domains.

Notes

1. This research extends prior work on position effects (Dietrich, 2008a,b; Haque & Ginsparg, 2009; Smart & Waldfogel, 1996; Stremersch, Verniers, & Verhoef, 2007) in a number of important ways. First, we attempt to provide evidence for the causal nature of the effect. While prior work has shown a link between order and citations, it could be attributed to editorial placement or self-promotion. Editors may place better articles earlier (see below) or in situations where submission time determines placement, smarter authors (who may produce higher quality papers) may try to game the system to get placed early. Our identification strategy attempts to deal with both these concerns. Second, prior work on cases where authors determine order has found that the position effect is driven largely by self-promotion (Dietrich, 2008a,b; Haque & Ginsparg, 2009), but given that most journals have editorial placement, it is important to see whether the effect still holds in this broader situation. Third, looking at these effect across a large time horizon allows us to explore how changes in reading practice (i.e., more online and less in the journal) impact the observed effects.
2. While some researchers have suggested that citations may not be entirely unbiased (e.g., Baldi, 1998; Bornmann & Daniel, 2008), it is tough to test this empirically. Relationships that could be construed as bias (e.g., papers with more prestigious authors are cited more, Haslam et al., 2008) could also be driven by more normative factors (i.e., such authors write objectively better papers).
3. Note that this identification strategy requires a journal with (a) different sections that are (b) independently edited, where (c) section choice is not based on article length and (d) most articles sent to one section could not easily be sent to another. The journal must also have these characteristics for a long enough time period to generate a reasonable dataset. Some journals have different sections based on article length (e.g., *Psychological Science*), but this may introduce confounds. Other journals allow authors to submit to different topical sections, but a single editor then chooses article order for the whole journal rather than articles being published in contiguous topical sections (e.g., *Management Science*). Thus, JPSP is an ideal situation to examine the possible effects.
4. Randomly selecting one of our JPSP articles shows that over 30% of cites to other JPSP articles are to articles from other sections of the journal.
5. The Negative Binomial Regression models allow over dispersion and are useful to count for the unobserved heterogeneity in the Poisson Regression model (Greene, 2005).
6. Another alternative explanation is that quality differences between first and other articles are somehow larger in the first section. Though possible, this appears unli-

kely. The first two sections contained similar numbers of articles, making it doubtful that greater variance caused by more articles drove the effect. Furthermore, for this to drive the results editors would still have to accurately place the highest quality articles first, which editor correspondence shows did not occur most of the time.

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