Disfluency Increases Reliance on Heuristic Cues in Consumer Choice

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Disfluency Increases Reliance on Heuristic Cues in Consumer Choice

According to past research, experiencing difficulty while processing information (disfluency) can lead people to use a systematic information processing style, paying more careful attention and considering information more thoroughly. Though recent researchers have questioned these results, finding no relationship between disfluency and processing style, we provide evidence for the opposite in a consumer choice context. That is, rather than processing information systematically, consumers in six pre-registered large-sample size experiments were more likely to process information heuristically, characterized by less in-depth processing, leading to their reliance on heuristic cues like a well-known brand, a preferred country-of-origin, or a recommendation. Our results suggest that heuristic processing is more likely in a consumer setting, where a "good enough" solution will suffice, while disfluency has no detectable effect in settings where there is an objectively correct solution, like the types of problems studied previously. The findings contribute greatly to our understanding of disfluency and information processing styles and highlight how seemingly ancillary factors in the decision environment can greatly affect consumers' choices.

Keywords: heuristics, disfluency, choice.

Track: Consumer Behaviour

1. Introduction

Marketing materials, including flyers, packaging, and websites, often present challenges to consumers due to factors such as unconventional fonts, distracting background images, and low image resolution. These elements contribute to disfluency–feelings of difficulty experienced when processing information. While researchers have long documented the role of disfluency in consumers' judgments and product evaluations, there is considerable disagreement among scholars as to how disfluency may influence consumer choices.

On the one hand, disfluency may lead consumers to process information more carefully and systematically (Alter et al. 2007; Song and Schwarz 2008; c.f., Meyer et al. 2015; Thompson et al. 2013). From this perspective, disfluency while choosing could serve as a metacognitive cue that something is amiss, leading consumers to pay more careful attention than otherwise. On the other hand, some research suggests the opposite. From this perspective, disfluency could signal that choosing will be difficult, which prompts individuals to use what could be considered heuristic simplifying strategies—such as choosing a compromise option or deferring the choice—to cope with the perceived difficulty (Novemsky et al. 2007).

In this article, we examine which of these possibilities stands up to empirical scrutiny. Resolving the divergent findings in the literature, the results of six large-scale, preregistered experiments support the idea that when consumers experience disfluency during decision making, they process information more heuristically and less systematically compared to fluent processing. In addition, to explain the conflicting results in previous studies, we consider the types of tasks they involved, since the effects of disfluency are highly influenced by such factors (Whittlesea 1993). Moreover, we extend the past literature by examining heuristic strategies beyond compromise and deferral (Novemsky et al. 2007).

2. Background

Processing disfluency refers to the subjective feeling of difficulty experienced when performing a cognitive task like decision-making (Alter and Oppenheimer 2009; Novemsky et al. 2007). Consistently, experiencing disfluency leads to less favorable judgments and evaluations (Schwarz et al. 2021). These effects are said to be due to people misattributing the negative feeling of difficulty processing information as being about whatever they are evaluating (Alter and Oppenheimer 2009). While researchers have long documented the role of disfluency in consumers' judgments and product evaluations, there has been less agreement about *how* disfluency affects information processing in choice-making settings. A helpful

framework for understanding how disfluency might affect cognitive processing involves dual systems for processing information.

2.1. Disfluency and systematic processing

Disfluency may serve as a metacognitive cue that something is amiss, and this may lead people to adopt a more systematic processing style, paying more careful attention than they might otherwise. Alter et al. (2007) provided preliminary evidence that people process information systematically when they experience disfluency by documenting improved performance on the Cognitive Reflection Test (CRT) and a six-item syllogistic reasoning task. The result found in other studies as well (Diemand-Yauman, Oppenheimer, and Vaughan 2011; Song and Schwarz 2008). While these authors have argued that the results arose because people spent more time and effort processing information when experiencing disfluency, Meyer and his colleagues (2015) found no evidence that disfluency leads to analytical reasoning or systematic processing. Aggregated data from 16 experiments failed to provide evidence that disfluent fonts affect performance on the CRT or the syllogism task. Thompson and her colleagues (2013) also challenged the association between perceptual fluency and analytical or systematic thinking, finding no relationship.

2.2. Disfluency and Heuristic Processing

Disfluency may serve as a metacognitive cue to *choice difficulty*—a feeling of indecision experienced when contemplating tradeoffs between options—and it can lead consumers to avoid making choices or to choose compromise options (Novemsky et al. 2007). While these results were not interpreted as aligning with a particular processing style (heuristic vs. systematic), we note that compromise and deferral could be considered ways to simplify a decision (Dhar and Simonson 2003). Thus, they could be considered evidence that disfluency may encourage consumers to process information more heuristically.

The results suggest that consumers try to avoid making tradeoffs when they experience disfluency. However, it is less clear how disfluency may affect consumers' choices when tradeoffs cannot be avoided, as when choosing between two options without the option to defer and there is no possibility of compromise. To help answer this open question, we consider heuristic versus systematic processing styles more generally. This perspective allows us to make predictions about consumers' use of *heuristic cues* as a function of disfluency. Specifically, we predict that heuristic cues such as a brand name or country of

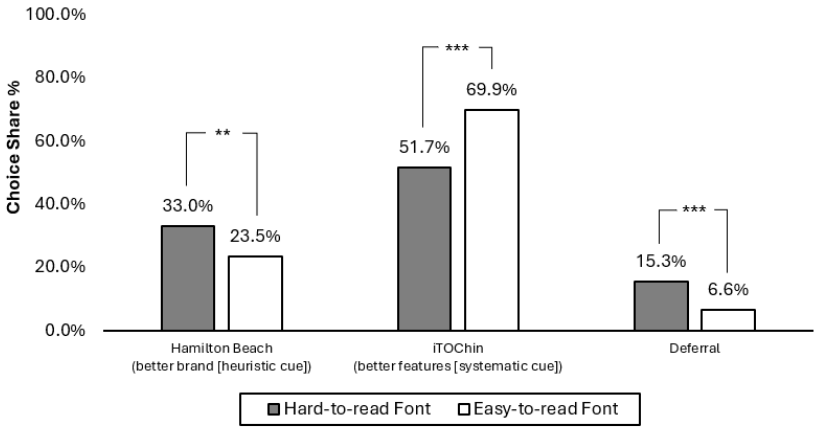
origin may have more influence over a choice under disfluent processing conditions compared to fluent conditions.

2.3. Reconciling the conflicting findings: the role of the task

To explain the conflicting results in previous studies, we consider the types of tasks they involved, since the effects of disfluency are highly influenced by such factors (Whittlesea 1993). For math problems and logical puzzles (Alter et al. 2007; Meyer et al. 2015; Song and Schwarz 2008), there is typically only one correct answer. This is not the case for consumer choices (Novemsky et al. 2007), where what is considered correct varies based on personal preference, and often a "good enough" option is acceptable (Simon 1955). Thus, the use of heuristic strategies seems more likely in settings where there is a subjective outcome or where a "good enough" solution will suffice, such as consumer choices, and disfluency should increase this tendency. In contrast, in settings where the goal is to identify the one correct solution, the likelihood of using a heuristic strategy should not increase, as it often cannot produce a correct response. This implies that decision makers in these tasks may respond differently to disfluency.

3. Results

Study 1 (*N*=601) tested our main prediction that disfluency leads consumers to choose products based on heuristic cues. Participants received descriptions of two blenders in a font that was either hard-to-read (disfluent) or easy-to-read (fluent). One blender was objectively superior, having better specs and features, while the other had only a better heuristic cue. In all studies we used the same logic to design the choice task. In this study, we used a mixture of brand name and country of origin as heuristic cues. In addition, we counterbalanced the option-order in all studies. Participants asked to make a choice while they had the choice to defer. While 24.2% of participants reading the easy-to-read font chose the Hamilton Beach blender, 35.1% of those reading a hard-to-read font did ($\chi^2(1) = 6.69$, $p = .010$), aligning with our prediction that the better brand would be chosen more often under disfluent processing conditions. Moreover, we replicated previously reported findings related to choice deferral ($\chi^2(1) = 11.70$, $p < .001$; Novemsky et al. 2007).



NOTE. — ***p < .001; **p < .01

Figure 1. Disfluency leads consumers to simplify the choice by choosing a better brand (left two bars) or deferring choice (right two bars).

We observed the same results amongst 76% of participants who correctly recalled all product features ($P_{easy\ to\ read}$ = 21.2%, N = 53/250 vs. $P_{hard\ to\ read}$ = 30.5%, N = 64/210; $\chi^2(1)$ = 5.18, p = .023), suggesting the effect is not (only) due to people failing to read when the information is in a bad font.

Study 2 (N=1807) examined how disfluency can lead to heuristic reasoning in an incentive-compatible choice setting. Participants were entered into a lottery (adapted from Song and Sela 2023) for a chance to win their chosen outcome, giving them an incentive to choose well. Participants asked to make a choice between two options. The result showed that amongst participants who saw the products' information in a hard-to-read font, 64.4 % chose the Cuisinart coffee grinder (an option with a better brand name), whereas only 54.2% of those who saw the information in easy-to-read font did so ($\chi^2(1)$ = 19.42, p < .001).

Study 3 (N=602) tested if the effects we have observed are due to a metacognitive process, by employing an attribution paradigm (Lee and Shavitt 2009; Sela and Berger 2012). We used a brand name as a heuristic cue. We randomly assigned participants to one of three conditions: fluent (easy-to-read font without source attribution), disfluent (hard-to-read font without source attribution), and attribution (difficult-to-read font with source attribution). We manipulated disfluency using the same fonts as in previous studies. To manipulate the source attribution, some participants were forewarned that the font will make reading the text harder. Others were not told this information (Lee and Shavitt 2009; Sela and Berger 2012). We asked participants to make a choice between two air fryers. The results showed that

participants in the hard-to-read font condition were significantly more likely to choose the recommended toaster ($P_{disfluent}$ = 34.5%) compared to those in the easy-to-read font condition (P_{fluent} = 18.0%; $\chi^2(1) = 14.12$, $p < .001$) and those in the hard-to-read font condition who were prompted to attribute the difficulty to the font ($P_{attribution}$ = 24.5%; $\chi^2(1) = 4.79$, $p = .029$). Additionally, there was no significant difference between the hard-to-read font with attribution and the easy-to-read font conditions ($p = .112$). These results suggest that the effect of disfluency on the choice share of the recommended option is less pronounced when participants are prompted to correctly attribute the difficulty to the font, supporting the idea that the disfluency effect could be driven by a misattribution of difficulty to the choice task. As in study 1, we observed a consistent pattern among 66.78% of participants with equal recall (which indicates attention).

Study 4 (N=600) aimed to demonstrate the mediating process by measuring self-reported thinking styles separately. Participants randomly assigned into two conditions where we used background images to manipulate disfluency. They asked to make a choice between two blenders. The result showed that amongst participants who saw products' information on a background image, 60.6% chose Ninja blender, whereas 34.9% of those who saw the information without a background image did so ($\chi^2(1) = 40.15$, $p < .001$), replicating the previous findings. To assess the mediator, participants were asked to report the extent to which their processing style was systematic or heuristic; each were measured separately using three-item scales adapted from the literature (Novak and Hoffman 2009; Pocheptsova et al. 2010). To form a single *relative processing style* score for each participant, we subtracted heuristic processing from systematic processing. We found that those who experienced disfluency showed *higher* heuristic processing ($M_{background\_image}$ = 4.80, SD = 1.40) than did those who experienced fluency ($M_{white\_background}$ = 4.51, SD = 1.46, $t(602) = 2.48$, $p = .013$). Additionally, those who experienced disfluency showed *lower* systematic processing ($M_{background\_image}$ = 5.11, SD = 1.38) than did those who experienced fluency ($M_{white\_background}$ = 5.44, SD = 1.88, $t(602) = 3.10$, $p = .002$). These differences in processing information mediated the choice. That is, the indirect effect of disfluency on the choice share through *relative processing style* was significant using a bootstrapping technique (Model 4) with 10,000 iterations ($b_{indirect\_effect}$ = 0.25, SE = 0.07, 95% CI [0.12, 0.42]). As in studies 1and 3, we observed a consistent pattern among 70.69% of participants with equal recall (which indicates attention).

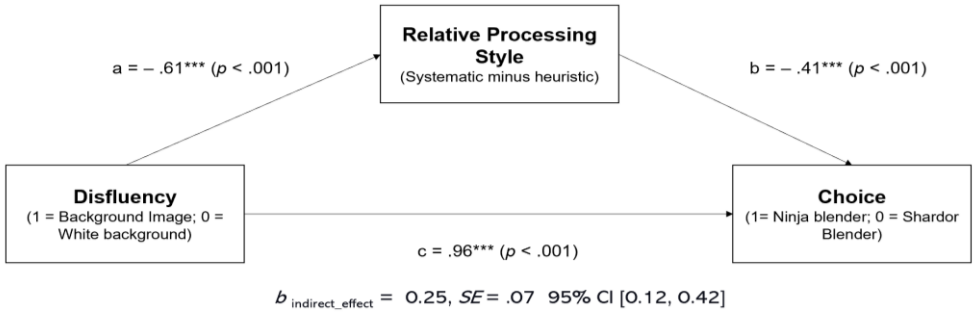


Figure 2. Study 4. Relative processing style mediates the effect of disfluency on choice

Study 5 (N = 604) demonstrates the effect of disfluency in realistic settings important for marketing managers—difficulty reading information on product packaging. Participants watched two short videos depicting three-dimensional packages of different steam irons slowly rotating to show all of the sides of the package. To manipulate disfluency, the packages were designed with product information presented over a background image. In the fluent condition, the same packages and information were shown without a background image, featuring a black font on a white background and a white font on a black background. The dependent measure was the choice of the Hamilton Beach steam iron from a binary choice set. The result indicated that 42.7% of participants saw packages with information written over background images chose the *Hamilton beach* one, while only 30.3% of those who saw packages without background images did so ($\chi^2(1) = 9.95$, $p = .002$).

Study 6 (*N*=604) aimed to elucidate the discrepancies observed in the existing literature and the outcomes of this paper. It is plausible that the divergent results stem from variations in the types of dependent variables. While there is an objectively correct answer in mathematical problem-solving tasks, there are no wrong answers in consumer choices, and this difference may underly the different findings. To test this possibility, in this study, we crossed a manipulation of disfluency (using font) with a manipulation where we randomly assigned participants to either make a choice (no correct answer) or choose an option with better specs and features (one was objectively superior). We used recommendation as a heuristic cue. We found a significant interaction of disfluency and question type on a choice share of the recommended toaster ($\chi^2(1) = 4.71$, $p = .030$). Follow-up analyses within each question format revealed that when people were asked to choose their preferred option to purchase, 19.9% of participants who saw the easy-to-read font chose the recommended toaster, whereas 40.4% of those who saw the hard-to-read font did so ($\chi^2(1) = 15.12$, $p < .001$). This effect was not observed when participants were asked to choose the option with

better specs (p = .13), as 15.9 % of participants who saw the hard-to-read font found the recommended toaster to have better specs and 9.9% of those who saw the easy-to-read font did so, replicating the previous findings of Meyer and his colleagues (2015).

4. General Discussion

Across six large-scale preregistered studies, we find that disfluency can lead consumers to rely more heavily on heuristic cues such as brand name (Gunasti and Ross Jr 2010; Maheswaran et al. 1992), country of origin (Maheswaran 1994), or recommendation to simplify their decision-making process. This finding contributes to the ongoing debate about how disfluency affects decision making. Some research has suggested that disfluency can lead consumers to process information more carefully and systematically (Alter et al. 2007; Song and Schwarz 2008; c.f., Meyer et al. 2015; Thompson et al. 2013). Other findings have suggested the opposite (Novemsky et al. 2007). This research sheds light on which of these competing possibilities stands up to empirical scrutiny in a consumer choice context. Moreover, the findings extend previous research showing that disfluency leads to deferred choices and preference for compromise options (Novemsky et al. 2007), arguing that those outcomes and the use of heuristic cues may both reflect a broader reliance on heuristic decision-making strategies during disfluency. Furthermore, we consider why past research has found inconsistent results. These studies provide evidence that fluency may affect consumer choices differently from other tasks, as consumer choices are often subjective and do not require precise answers.

Our research highlights how subtle differences in the presentation of options, particularly in e-commerce settings, can lead to unexpectedly disparate effects between well-established and less-established brands. For example, imagine that a retail web site decides to apply an algorithm to the images on its site that lowers their resolution as a way to save server space. On its face, this change appears neutral; all brands will have their image resolution reduced, and so all brands should be equally affected. However, our research suggests that this action could disproportionately favor well-established brands. Thus, retailers and less-established brands should be mindful of such changes. Moreover, by presenting information in a hard-to-read font, adding a background image to product information, presenting information in an image with degraded resolution, or displaying text not optimized for a small screen consumers' decisions about the options shifted to favor more familiar brands or recommended products. The findings align with the idea that brands play a vital role in projecting a positive image and impacting purchasing decisions (Keller 2020).

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