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Smooth Trajectories Travel Farther into the Future: Perceptual Fluency Effects on Prediction of Trend Continuation

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Abstract

This research examines how processing fluency influences people's perceptions of whether a trend will continue into the future. Specifically, three studies hypothesized that people who read descriptions of increasing or decreasing trends in easy-to-read font would be more likely to predict that the trend would continue into the future, compared to people exposed to difficult-to-read font. Studies 1 and 2 establish this effect for an increasing trend, whereas Study 3 replicates the findings with a decreasing trend. Taken together, these results suggest processing fluency as a factor that affects assessment of future potential.

The assessment of future potential—that is, whether a certain event or characteristic will develop, continue, or stop over time—is a fundamental part of everyday judgments. For instance, people anticipate whether economic growth rates will continue or crash before they invest in the stock market, and employers predict whether a promising job candidate's career will continue to rise or eventually cease.

Previous research has examined chronic factors that influence these trend predictions, such as lay theories regarding personal change (Dweck, 2008) and domain-specific theories such as the 'hot hand' in sports (Gilovich, Vallone, & Tversky, 1985). In addition, research identifies cultural differences in the heuristics people use when predicting future trends. When predicting the future direction of a linear trend such as world economy growth and cancer death rates, people in the United States and China tend to expect that a linear trend will continue (Ji et al., 2001), and this heuristic is especially present for Western cultures.

When such linear trend predictions are ill-advised (e.g., one perceives a 'lucky streak' when gambling, or invests money in stocks assuming that a bear market will persist into the future) the need to better understand how these everyday judgments arise becomes apparent. Indeed, little is known about the situational factors that affect the heuristic regarding trends. The present research suggests processing fluency as one such factor and proposes that fluency leads to increased judgments of trend continuation, whereas disfluency disturbs it.

Processing fluency is the metacognitive experience of ease or difficulty associated with processing information and can be affected by incidental variables such as exposure duration, high or low figure-ground contrast, and easy or difficult-to-read fonts (for reviews see Alter & Oppenheimer, 2009 and Schwarz, 2004). A growing body of literature suggests

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that fluency influences a wide range of people's judgments, including preferences (e.g., Reber, Schwarz, & Winkielman, 2004; Monahan, Murphy, & Zajonc, 2000), familiarity (e.g., Whittlesea, Jacoby, & Girard, 1990), truth (e.g., Reber & Schwarz, 1999) and risks (Song & Schwarz, 2009).

In addition, fluency influences people's processing style. Since fluency promotes feelings of familiarity (Whittlesea et al., 1990), and familiar information is processed more heuristically than unfamiliar information (Garcia-Marques & Mackie, 2001), feelings of fluency generate heuristic processing. For instance, people rely less on default answers to deceptive questions when the question is presented in a difficult-to-read font (Song & Schwarz, 2008a); and people are also less influenced by contextual cues, such as a communicator's physical appearance, when the communication itself is hard to read (Alter, Oppenheimer, Epley, & Eyer, 2007).

To the extent that increased fluency leads to heuristic responses, we predict that that people's judgments regarding linear trends may be also influenced by fluency. Specifically, when information regarding a linear trend is presented in a fluent format, people may expect that the trend will continue in the future, whereas presentation disfluency may attenuate this effect.

This hypothesis is also supported by research linking fluency with feelings of momentum. For example, people predict that tasks such as exercising and cooking will require more time when the instructions are printed in difficult-to-read versus easy-to-read font (Song & Schwarz, 2008b). Presumably, this effect occurs because fluency feeds the sensation of momentum, which in turn is projected to the described task. If people feel the same sensation of momentum when processing information about a trend, they may misread this feeling of momentum as indicative of the trend itself. Disfluent experiences may disrupt this momentum and contribute to feelings of trend discontinuation.

Therefore, we predicted that fluent processing of a trend would increase judgments that the trend will continue into the future. Specifically, we hypothesized that people who read descriptions of increasing or decreasing trends in easy-to-read font would be more likely to predict that the trend would continue into the future, compared to people exposed to difficult-to-read font.

Study 1: Increasing Career Trend

Method

One-hundred thirty participants (87 female, 42 male, 1 no report) participated in an online study. Participants read a passage about a psychology professor's career trajectory and funding information for three career stages: first as a graduate student, then as a postdoctoral fellow, and finally as an assistant professor. The professor started out receiving one grant as a graduate student, and in each successive career stage, he received one more grant. This vignette was presented in either an easy-to-read font (Arial) or a difficult-to-read font (Mistral).

Afterwards, participants answered a question regarding career trend continuation, specifically, whether the professor would receive more grants in his next career stage (1 = *Not at all likely*; 8 = *Very likely*).

Results and Discussion

An independent samples t-test revealed that participants who read the passage in an easy-to-read font predicted that the professor was more likely to continue getting more grants in his

next career phase ($M = 7.08$, $SD = 1.56$), compared to participants who read the passage in a difficult-to-read font ($M = 6.14$, $SD = 1.82$), $t(126) = 3.12$, $p < .005$, $d = .55$.

It could be argued that processing fluency elicits positive affect (Reber et al., 2004; Monahan et al., 2000), which results in a general positive evaluation (Schwarz & Clore, 1983). If such results were the case, people may misattribute the positive affect to their perceptions of career trajectory. Study 2 addresses this alternate explanation.

Study 2: Improving Athletic Record

Method

Fifty-four participants (34 female, 19 male, 1 no report) participated in an online study. Participants read about a coach and the record of his high school field hockey team over three recent seasons. The coach started out his first season winning only one game; in each successive season, his team won one more game. As in Study 1, the vignette was presented in either an easy-to-read font (Arial) or a difficult-to-read font (Mistral). Participants rated the likelihood that the coach would continue to improve his record (1 = *Not at all*; 8 = *Very much*).

We also took the opportunity to test whether participant memory differed between conditions. Participants answered two open-ended questions about details from the passage: "Without looking back, how many games did the coach win last year?" and "How many games did the coach win the year before that?" Afterwards, participants rated their current mood (-4 = *Extremely negative*; 4 = *Extremely positive*).

Results and Discussion

Replicating Study 1's findings, the data suggest that participants who read the passage in an easy-to-read font predicted that the coach would continue to win more games in the future ($M = 6.04$, $SD = 1.02$) compared to participants exposed to a difficult-to-read font ($M = 5.38$, $SD = 1.30$), $t(47.150) = 2.01^1$, $p = .05$, $d = .56$.

We tallied participants' correct answers on the factual questions to calculate an overall score of memory accuracy (Song & Schwarz, 2008). Consistent with previous studies, the data revealed that participants' memory for detail did not differ when viewing information in a difficult-to-read versus easy-to-read font, $t < 1$.

The data also revealed that participants who were exposed to the easy-to-read font were in a better mood ($M = 6.01$, $SD = 1.77$) compared to participants who were exposed to the difficult-to-read font ($M = 4.93$, $SD = 1.86$), $t(52) = 2.32$, $p < .05$. We used multiple regression to evaluate whether mood had a mediational role in the relationship between fluency and trend predictions. We first regressed fluency condition on trend predictions ($\beta = .28$, $p = .05$). We then regressed fluency on mood ($\beta = .31$, $p < .05$). When trend judgments were regressed simultaneously on fluency condition and mood, the data reveal that neither fluency nor mood were significant predictors of trend judgments ($\beta = .20$, $p = .16$, and $\beta = .25$, $p = .08$, respectively). Additionally, using the bootstrapping method developed by Preacher and Hayes (2008), we confirmed that the difference between the total and the direct effect of font on trend judgments is not different from zero, with a point estimate of .1712 and a 95% BCa bootstrap CI of -.0204 to .5822. In other words, the data reveal no indirect effect of mood on the relationship between font and trend judgments.

¹Levene's Test for Equality of Variances was violated, $F = 4.02$, $p = .05$, so equal variances were not assumed.

Thus, the results from Studies 1 and 2 suggest that processing fluency increases people's predictions that a trend will continue into the future. The data from Study 2 argued against the possibility that participants in the disfluent condition merely did not understand the text. Further, although the alternate explanation in terms of positive affect was not supported statistically, it was nonetheless the case that mood differences were obtained between the conditions. To more conclusively rule out the mood alternative, Study 3 featured a decreasing career trajectory as well as a mood measure. Because decreasing career trends are negative in nature, if fluency increases judgments that negative career trends are more likely to continue, this will demonstrate that the effect is not merely driven by mood.

One might also argue that the positive mood generated by fluency leads to general agreement with any question asked. To address this potential alternative, in Study 3 we added a question irrelevant to the trend itself but relevant to the target's career. If processing fluency increases people's judgments that career trends are likely to continue, but does not increase general agreement with questions not relevant to the trend itself, then this will suggest that our observed effects are specific to trends, and not merely driven by general agreeability.

Study 3: Decreasing Career Trend

Method

One-hundred thirty-two participants (77 female, 29 male, 26 no report) participated in an online study. Similar to Study 1, participants read about a professor's career in either easy-to-read font (Arial) or difficult-to-read font (Mistral). In this version, however, the professor first received six grants and in each successive career stage, he received one fewer grant.

Participants rated the likelihood that the professor would continue to receive *fewer* grants (using the same response scale from Study 1). They then rated how likely they thought the professor was to get tenure (1 = *Not at all*; 8 = *Extremely*), and provided their current mood (-4 = *Extremely negative*; 4 = *Extremely positive*). In addition, to check whether participants in the two conditions understood the text to an equal extent, they indicated whether the number of grants the professor received had increased, decreased, or remained the same.

Results and Discussion

Replicating the results from Studies 1 and 2, we found that participants who read the passage in an easy-to-read font predicted that the professor would receive fewer grants in the future ($M = 5.14$, $SD = 1.65$) compared to participants who read a difficult-to-read font ($M = 4.55$, $SD = 1.58$), $t(126) = 2.07$, $p < .05$, $d = .37$.

The data also argue against the first alternate explanation in terms of positive affect, fluency had no effect on participant mood, $t < 1$. Moreover, participants in the fluent condition did not endorse the tenure statement any more than did those in the disfluent condition, $t < 1$; this helps to rule out the second alternate explanation (general agreeability) by showing that the hypothesized fluency effects on trend predictions did not merely come from a more general tendency to agree to statements regarding the target. A pair of multinomial regressions revealed no differences between conditions regarding text comprehension, such that participants in the disfluent condition were not more likely to misunderstand the decreasing trend as either staying the same ($B = .14$, $SE = .54$, $p = .79$) or increasing in nature ($B = .44$, $SE = .61$, $p = .47$) compared to participants in the fluent condition.

General Discussion

Three studies suggest that processing fluency influences people's perceptions of whether a trend will continue into the future. Studies 1 and 2 established this effect for an increasing trend. Study 3 replicated the findings with a decreasing trend and addressed the alternate explanation of mood. It is important to note that our observed effects may be driven by the heuristic and analytic processing styles, as well as feelings of momentum associated with experiences of fluency and disfluency. Future research would be well aimed at addressing the mechanisms underlying the effects explored in this research.

These results have a wide range of practical implications. People derive predictions about the future both every day and across a wide variety of domains. From professional domains including medical reports, weather patterns, sports statistics, and market performance, to personal domains such as whether a personal relationship will continue to grow, fluency has the potential to impact a fundamental part of judgment and decision making. For instance, by varying the presentation of information through commonplace contextual variations as subtle as print clarity, dimly-lit viewing conditions, background noise, or repeated exposure to news reports could potentially influence people's opinions regarding the future direction of a trend. Additional research may address these possibilities.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

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