Is Earth a Perfect Square? Repetition Increases the Perceived Truth of Highly Implausible Statements

Article *in* Cognition · January 2022

DOI: 10.1016/j.cognition.2022.105052

CITATIONS
10

READS
635

3 authors:

Doris Lacassagne
Université Catholique de Louvain - UCLouvain
2 PUBLICATIONS **10** CITATIONS
SEE PROFILE

Jérémy Béna
Université Catholique de Louvain - UCLouvain
18 PUBLICATIONS **69** CITATIONS
SEE PROFILE

Olivier Corneille
Université Catholique de Louvain - UCLouvain
168 PUBLICATIONS **5,860** CITATIONS
SEE PROFILE

Is Earth a Perfect Square?

Repetition Increases the Perceived Truth of Highly Implausible Statements

Doris Lacassagne, Jérémy Béna & Olivier Corneille

UCLouvain, Belgium

Manuscript accepted at *Cognition*. The present document may not exactly replicate the final, authoritative version of the article as published in Cognition.

doi: 10.1016/j.cognition.2022.105052

Conflict of interest statement: The authors declare no conflict of interest.

Funding: This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Correspondence concerning this article should be addressed to Jérémy Béna, UCLouvain, PSP IPSY, 10 Place du Cardinal Mercier, 1348, Louvain-la-Neuve, Belgium. Email: jeremy.bena@uclouvain.be

CRediT authorship contribution statement

DL: Conceptualization, Formal analysis, Investigation, Methodology, Software, Writing – original draft. JB: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Software, Visualization, Writing – original draft, Writing – review & editing. OC: Conceptualization, Methodology, Supervision, Writing – review & editing.

Abstract

A single exposure to statements is typically enough to increase their perceived truth. This Truth-by-Repetition (TBR) effect has long been assumed to occur only with statements whose truth value is unknown to participants. Contrary to this hypothesis, recent research has found that statements contradicting participants' prior knowledge (as established from a first sample of participants) show a TBR effect following their repetition (in a second, independent sample of participants). As for now, however, attempts at finding a TBR effect for blatantly false (i.e., highly implausible) statements have failed. Here, we reasoned that highly implausible statements such as *Elephants run faster than cheetahs* may show repetition effects, provided a sensitive truth measure is used and statements are repeated more than just once. In a preregistered experiment, participants judged on a 100-point scale the truth of highly implausible statements that were either new to them or had been presented five times before judgment. We observed an effect of repetition: repeated statements were judged more true than new ones, although all judgments were judged below the scale midpoint. Exploratory analyses additionally show that about half the participants showed no or even a reversed effect of repetition. The results provide the first empirical evidence that repetition can increase perceived truth even for highly implausible statements, although not equally so for all participants and not to the point of making the statements look true.

Keywords: truth effect; illusory truth; repetition; multiple exposures; low plausibility

Is Earth a Perfect Square?

Repetition Increases the Perceived Truth of Highly Implausible Statements

1. Introduction

Could individuals come to believe highly implausible information, such as "The Earth is a perfect square" following their mere repetition? In general, repeated exposure to a given piece of information increases its believability. This Truth-by-Repetition (TBR) effect is robust and has been demonstrated hundreds of times (for a meta-analysis, see Dechêne et al., 2010; for early demonstrations, see Hasher et al., 1977; Bacon, 1979; Schwartz, 1982; for a recent overview, see Unkelbach et al., 2019). A prominent theory is based on processing fluency (Reber & Schwarz, 1999; Unkelbach, 2007): repeated statements are easier to process than new ones, and this processing fluency is used as a cue for truth. Typically, the TBR effect is demonstrated using only one previous exposure, but additional exposures (e.g., 4, 8, 16) may lead to a larger TBR effect (Arkes et al., 1991; DiFonzo et al., 2016; Fazio et al., 2021; Hassan & Barber, 2021).

A widespread assumption is that a statement's truth status must be ambiguous for a TBR effect to be found. In their meta-analysis of the TBR effect, Dechêne et al. (2010, p.239) noted:

"*The only constraint seems to be that the statements have to be ambiguous, that is, participants have to be uncertain about their truth status because otherwise the statements' truthfulness will be judged on the basis of their knowledge and not on the basis of fluency."*

This "truth ambiguity" assumption has been formally implemented in Multinomial Processing Tree (MPT) models. For instance, in Unkelbach and Stahl's (2009) MPT model, a statement's factual truth is known with a probability *k* (for knowledge), and it is only in the

absence of this knowledge (1-*k*) that enhanced fluency should increase the probability *f* of judging this statement as true (see also Hilbig, 2012, for a related model of truth judgments).

Recent studies that found a TBR effect with statements contradicting people's prior knowledge, however, question the "truth ambiguity" assumption (Brashier et al., 2020; Fazio et al., 2015; Fazio et al., 2019; Fazio, 2020). Fazio et al. (2015) compared the fit of two MPT models. One model was knowledge-conditional; in that model, fluency drives judgments with a probability *f* only in the absence of knowledge. The other model was fluency-conditional; in that model, fluency drives judgments with a probability *f*, and knowledge drives judgments only when fluency is absent or discounted. In two experiments involving statements contradicting participants' prior knowledge, as established from an independent sample of participants (e.g., "The Atlantic Ocean is the largest ocean on Earth"), these authors found that the fluency-conditional model fitted the data well, while this was not the case for the knowledge-conditional model. Further challenging the "truth ambiguity" assumption, Pennycook et al. (2018) recently found a TBR effect with *fake news*, which commonly lacks plausibility[1].

In sum, previous research indicates that the TBR effect occurs for statements contradicting prior knowledge, which questions the "truth ambiguity" assumptions endorsed by classic fluency models. Yet, statements may vary in the degree to which they deviate from prior knowledge. Statements such as "The Atlantic Ocean is the largest ocean on Earth" are less blatantly false (the Atlantic Ocean is the second-largest ocean while the Pacific Ocean is the

[1]Relatedly, TBR effects were found even when declarative information about statements' truth status was available when performing truth judgments (Unkelbach & Greifeneder, 2018). The truth ambiguity assumption is also questioned in studies finding TBR effects on statements commonly known as true (Unkelbach & Speckmann, 2021).

largest) than statements such as “Elephants run faster than cheetahs,” which are outright violations of common sense. Would a TBR effect occur for statements that are blatantly at odds with prior knowledge – i.e., highly implausible statements?

Little research to date has informed this question. Pennycook et al. (2018) did not find a TBR effect with extremely implausible statements (e.g., “The Earth is a perfect square”), which suggests a plausibility constraint on the TBR effect. However, Fazio et al. (2019) proposed a model where repetition-induced belief is constant across all levels of plausibility. In this model, repeated exposure to highly implausible, highly plausible, and uncertain statements (of medium plausibility) should lead to the same increase in belief in the statements. Yet, because highly implausible statements are unlikely to be judged as true, the model assumes that the TBR effect is less likely to be observed with such statements.

Fazio et al. (2019, Study 2) used a typical TBR paradigm where statements from all gradients of plausibility were either presented both in an exposure phase (an interest rating task) and in a dichotomic truth judgment task or were new at the time of the truth judgment task. Fazio et al. found a TBR effect for moderately plausible statements but did not find a TBR effect at the extremes of the distribution (i.e., with either highly implausible or highly plausible statements; see Table 1 in Fazio et al., 2019). These results are consistent with Fazio et al.’s model: even if repetition theoretically increases perceived truth of statements from all gradients of plausibility, the TBR is likely to go undetected with statements low or high on the plausibility scale. This is because such statements receive responses with low variability (whether they are repeated or not), therefore limiting the likelihood to find evidence for a TBR effect for those extreme statements. In sum, Fazio et al.’s results suggest that perceived truth (latent variable) increases with repetition even though an increase in truth judgments (manifest variable) fails to be detected.

As Fazio et al. (2019) pointed out, not categorizing as true a highly implausible statement does not mean that repetition did not influence its perceived truth value. It may just be the case that typical truth measures are insufficiently sensitive to a repetition effect. If so, we reasoned that a TBR effect may be observed for highly implausible statements when a more sensitive measure is used, and additional repetitions are involved.

In the present study, we focused on highly implausible statements and tested whether we could find empirical evidence for an effect of repetition on their perceived truth. We chose to use only highly implausible statements because we believe finding a TBR effect with such statements is of greatest concern from an applied perspective, as misinformation and disinformation (e.g., *fake news*; hoaxes; conspiracy theories) can spread on a large scale (e.g., Del Vicario et al., 2016; Vosoughi et al., 2018). In addition, a TBR effect on highly plausible (but not highly implausible) statements could be constrained by ceiling effects.

Of importance, we introduced two methodological innovations compared to typical TBR studies. First, repeated statements were displayed five times (not only one) in the exposure phase. Second, we used a 100-point scale in the truth judgment task (instead of a dichotomous rating task or a 7-point Likert scale). In doing so, we may be able to detect a TBR effect for highly implausible statements, thereby giving credence to Fazio et al.'s (2019) model and questioning the "truth ambiguity" assumption. Finding a TBR effect with highly implausible statements would suggest that even blatantly false and preposterous information may benefit from repeated exposure.

2. Method

We report how we determined our sample size, all data exclusions, all manipulations, and all measures in the study. The preregistration, experiment program, data, and analyses are publicly available on https://osf.io/pe4g9/.

2.1 Participants and design

We manipulated Repetition (New vs. Repeated five times) as a within-participants factor. We recruited 240 participants (our targeted sample size) on Prolific (51.25% female, one not reported; M_{age} = 35.28; SD_{age} = 11.96, one not reported). Participants (1) were English speakers, (2) declared to live in the United States, (3) had an approval rate of at least 95%, and (4) had already completed at least 100 previous submissions. Participants were paid US$ 1.41 for completing the study. We excluded eight participants (seven participants did not end the study, resulting in no data; one participant declared that they did not take their response seriously). This resulted in a final sample size of 232 participants.

To determine sample size, we set α to .05, and we aimed for a statistical power of 80% to detect an effect as small as Cohen's d = 0.2 in a paired samples t-test. An analysis with G*Power (Version 3.1.9.6, Faul et al., 2007) found that we would need 199 participants. To avoid a final sample smaller than the targeted sample size, we increased this estimate by 20%, resulting in a targeted sample size of 240 participants.

2.2 Materials and procedure

We programmed the experiment with lab.js (Henninger et al., 2021), and we used JATOS (Lange, Kühn, & Filevich, 2015) to run the study online on Prolific. We used the 16 most implausible statements used by Fazio et al. (2019) (only 0% to 20% of the participants rated them as true). We decided to use the two most implausible bins from Fazio et al. and not the most

extreme bin only (made of 8 statements with 0% to 10% of "true" judgments). This is because our hypothesis can be tested with highly (not necessarily only the most extremely) implausible statements and because using the most extreme bin only may have led to noisier estimates (and, as a result, lower statistical power) by having only four observations in each Repetition condition (instead of eight, as in the present study).

Upon clicking on the study link, participants were told that we were interested in the role of various variables in the evaluation of statements. After providing their informed consent, participants entered the exposure phase. The instructions were as follow: "*In this first part, you will judge how interesting some statements are to you on a scale from 1 (very uninteresting) to 6 (very interesting). For each statement, please select the value that most closely represents what you think. Some of these statements will appear several times. When you are ready, please start by pressing the spacebar*." Participants rated their perceived interest (as per Fazio et al., 2019 and multiple studies on the TBR effect; see Henderson et al., 2021) on eight statements (either from Set A or from Set B, counterbalanced between participants). The eight statements were presented five times in a random order, resulting in 40 trials. To rate their interest, participants used a 6-point Likert scale (1: Very uninteresting; 6: Very interesting) with no time limit. Upon clicking on their response, the next statement was displayed with an intertrial blank screen of 500 milliseconds.

Right after the exposure phase, participants began the truth judgment task. The instructions were as follow: "*In the following part, we are interested in how true you think some statements are. Some statements will be repeated from the previous task. To evaluate the truth of the statements, you will use a scale from -50 (Definitely false) to 50 (Definitely true). For each statement, please select the value that most closely represents what you think. When you are*

ready, please start by pressing the spacebar." Participants rated their perceived truth of 16 statements (half seen in the exposure phase) displayed in a random order on a scale from -50 (Definitely false) to +50 (Definitely true), without time limit.

After the truth judgment task, we administered a seriousness check (based on Aust et al., 2013) to exclude participants that did not take their responses seriously (participants were informed that their response to this question would not affect their payment). We then thanked and debriefed participants.

3. Results

3.1 Preregistered analyses: Can a TBR effect be observed for highly implausible statements?

First, we conducted a Shapiro-Wilk test on differences between mean truth judgments on repeated vs. new statements to determine whether we should use parametric or non-parametric tests. Because data distribution was not normal, we used a Wilcoxon signed-rank test. However, as the distribution was close to normal (see Figure 1B), we also report the frequentist and default (see Rouder et al., 2009; we used a Cauchy distribution with $\sqrt{2}/2$ as the scale value) Bayesian preregistered paired samples *t*-tests.

Indicative of a TBR effect, participants judged repeated statements as more true (i.e., less false) than new statements (see Figure 1; see Figure 2 for results by statements). This result is apparent in both a Wilcoxon signed-rank test, $Z = 4.65$, $p < .001$, $r_{rb} = .216$, and a paired samples *t*-test, $t(231) = -4.49$, $p < .001$, $d = 0.278$, $95\%CI_d = [0.154; 0.402]$. The default Bayesian *t*-test yielded substantial evidence for the TBR effect, $BF_{10} = 1023.89$. Repeated ($M = -41.21$; $SD = 9.22$; Median = -43.75) and new ($M = -43.57$; $SD = 7.48$; Median = -46.69) statements were all

judged below the mid-point of the scale – hence, repetition did increase truth judgments only by making repeated statements judged as less false than new ones[2].

3.2 Not preregistered analyses looking at subsets of participants.

We computed a TBR effect score for each participant (the difference between truth judgment scores on repeated and new statements). In doing so, we were able to identify which participants descriptively showed larger truth judgment scores on repeated vs. new statements (positive scores), larger truth judgment scores on new vs. repeated statements (negative scores), and no difference between repetition conditions (exactly 0 scores). The results computed on the total sample are driven by a subset of participants as only 52.58% (n = 122) had a positive TBR effect score (M_{new} = -43.93, SD_{new} = 6.88; M_{rep} = -36.33, SD_{rep} = 9.43; M_{Δ} = 7.6, SD_{Δ} = 6.36), 19.4% (n = 45) had an exactly 0 truth effect score (M_{new} = -49.7, SD_{new} = 1.23; M_{rep} = -49.7, SD_{rep} = 1.23), and interestingly 28.02% (n = 65) had a *negative* TBR effect score (M_{new} = -38.66, SD_{new} = 7.75; M_{rep} = -44.48, SD_{rep} = 5.54; M_{Δ} = -5.82; SD_{Δ} = 5.67), the latter of which is significantly different from 0, $t(64) = -8.28$, $p < .001$, $d = 1.027$. Consistent with recent findings (see below), these complementary analyses suggest that all participants are not equally prone to the TBR effect.

---

[2] In a non-preregistered 2 (Repetition: New; Repeated five times – within-participants) × 2 (Counterbalancing: Set A repeated and Set B new vs. Set B repeated and Set A new – between participants) mixed ANOVA, we did not find a significant main ($F(1, 230) = 0.01$, $p = .927$, $\eta^2_G < .001$) or interactive ($F(1, 230) = 0.64$, $p = .425$, $\eta^2_G < .001$) effect of the Counterbalancing condition.

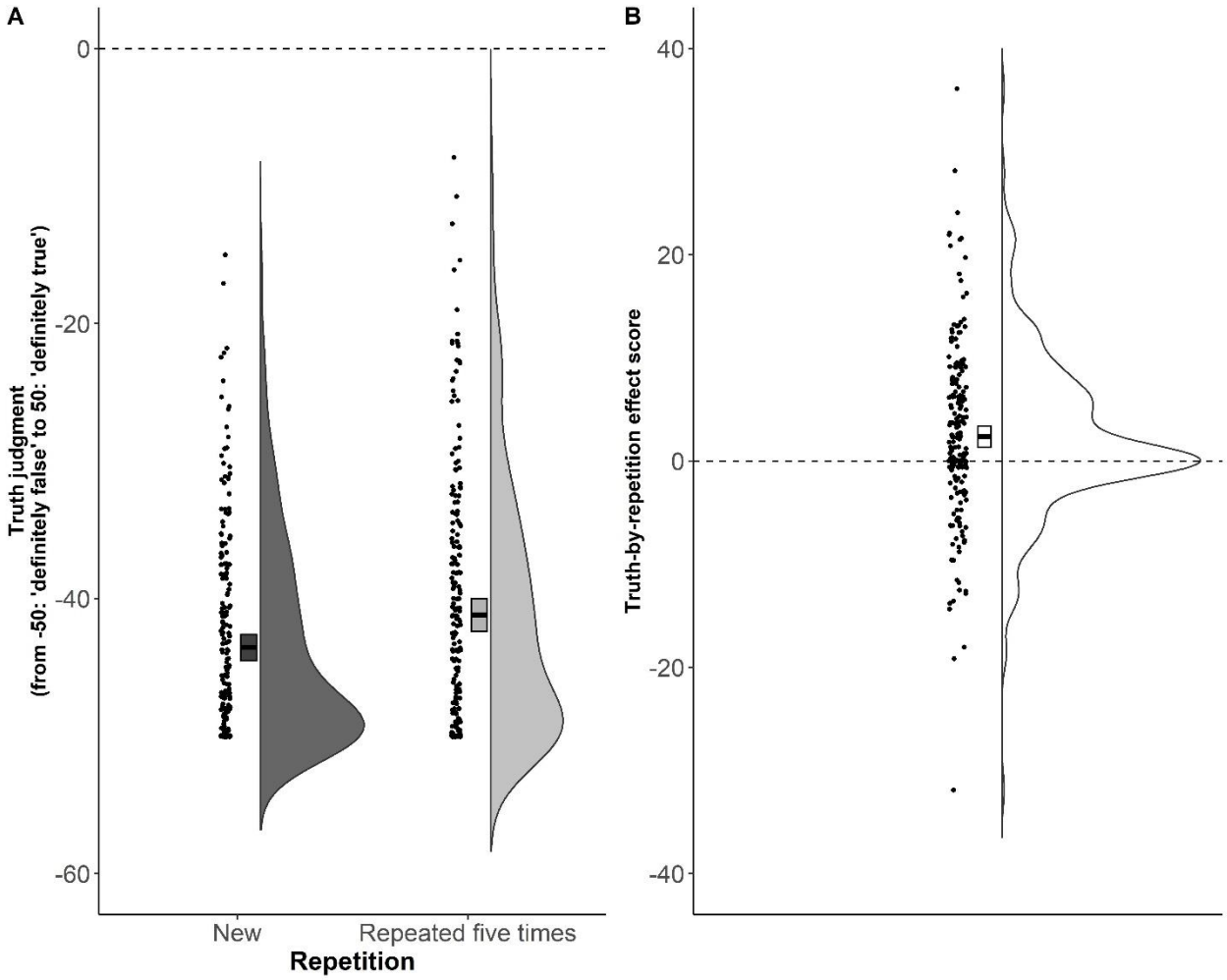

Figure 1. Truth judgments as a function of Repetition (dashed horizonal line: no bias toward the "False" or the "True" side) **(A)** and TBR effect scores (dashed horizontal line: no difference between truth judgments scores on repeated and new statements; positive scores: higher truth judgments for repeated than new statements; negative scores: higher truth judgments for new than repeated statements) **(B)**. The dots are the participants' scores (jittered). The lower and upper limits of the boxplots are the 95% confidence intervals, with the mean in between. The distributions represent the kernel probability density of the data.

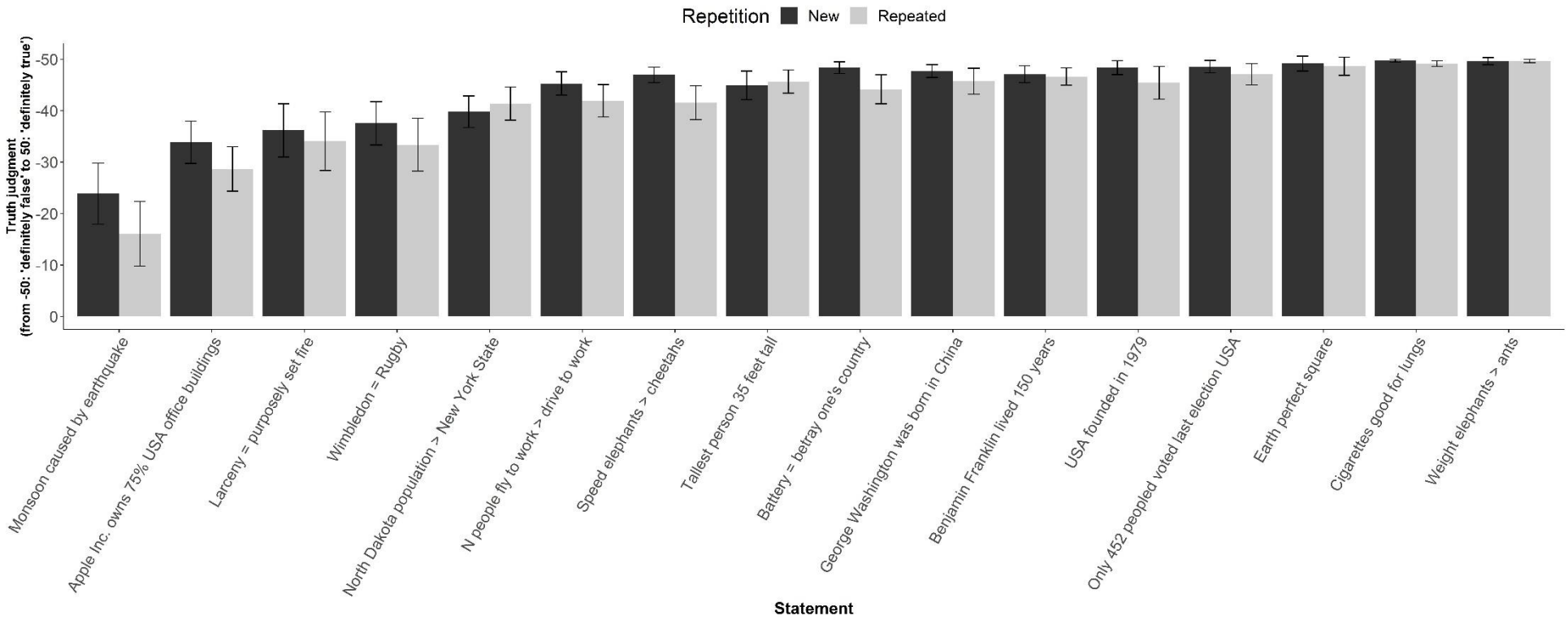

Figure 2. Mean truth judgments (scale reversed) as a function of Statements and Repetition. The error bars are the 95% confidence intervals. The statements were abbreviated for the sake of readability; the complete statements are available at https://osf.io/pe4g9/.

4. Discussion

Using five repetitions and a 100-point judgment scale allowing for finer-grained gradients in perceived falsehood, we found a TBR effect for highly implausible statements: participants started giving credence to statements as highly implausible as "the Earth is a perfect square" or "Benjamin Franklin lived 150 years" after repeating them for just five times. This finding provides important theoretical insights informing current models of the TBR effect. Contrary to the "truth ambiguity" assumption endorsed in knowledge-conditional multinomial processing tree models, Fazio et al.'s (2019) model posits that repetition increases the perceived truth of statements at all gradients of plausibility. We found here evidence supportive of this model for statements located at the very low-end of the plausibility continuum.

Because we used five repetitions and a 100-point scale, our study simultaneously deviates in two ways from usual TBR procedures where one repetition is implemented, and dichotomous ratings/Likert scales are typically used. Therefore, we cannot say which feature (or their combination thereof) is responsible for the current findings. There are reasons to think that increasing the number of repetitions from one to five increased the likelihood to find a TBR effect, as suggested by research on ambiguous statements (e.g., Fazio et al., 2021; Hassan & Barber, 2021). Likewise, using a sensitive scale increased the probability of detecting small differences of perceived truth between repeated and new statements that may be difficult to find with less sensitive dichotomous ratings or Likert scales. Future research could orthogonally vary the number of repetitions and the truth judgment scale to quantify whether and how much each feature contributes to the TBR effect with implausible statements.

Future research may also clarify the reason for interindividual variations in the TBR effect. Almost half of the participants had a null TBR score or even showed *lower* perceived truth

on repeated than new statements. The variability between participants in the TBR effect was greater here than the one estimated by Schnuerch et al. (2020) using Bayesian analyses. In their study, about 20% of the participants did not demonstrate the typical TBR effect (see also Henderson et al., 2021, who found that 14.8% of their sample did not show a TBR effect). A possibility is that processing fluency may not always be interpreted as a cue for truth – the fluency interpretation can be reversed (see Unkelbach, 2007; see also Silva et al., 2016). Relatedly, Corneille et al. (2020) found a *fakeness-by-repetition* effect, whereby perception of a statement as having been used as a fake news on social media (a judgment ecology where misinformation is widespread) is higher for repeated than new statements. Because only highly implausible statements were used in the present experiment, it may be that some participants relied on fluency as a proxy for falsehood. Future research could assess whether the TBR effect with implausible statements depends on individuals' perceived processing fluency – truth status relation, which could account for individual differences in the demonstrated effect.

5. Conclusion

We found that even a very limited number of repetitions can increase the perceived truth of highly implausible statements. These results complete existing evidence by demonstrating that the high implausibility of a statement does not prevent it from repetition effects. On a theoretical level, this finding raises further doubts about the validity of the truth ambiguity assumption.

Complementary analyses showed that highly implausible statements do not benefit from repetition in the same way for everyone, though: some individuals may be left unaffected by repetition and some others may even show decreased perceived truth following repetition. Better understanding when, whom, and why one may develop a sense of truth for implausible statements following their repetition is of both high theoretical and practical interest.

Acknowledgments

We thank Douglas Bancu, Olivier Desmedt, Antoine Mauclet, and Prof. Christian Unkelbach for their valuable comments during the preparation of this manuscript.

References

Arkes, H. R., Boehm, L. E., & Xu, G. (1991). Determinants of judged validity. *Journal of Experimental Social Psychology*, *27*(6), 576-605. https://doi.org/10.1016/0022-1031(91)90026-3

Aust, F., Diedenhofen, B., Ullrich, S., & Musch, J. (2013). Seriousness checks are useful to improve data validity in online research. *Behavior Research Methods*, *45*(2), 527-535. https://doi.org/10.3758/s13428-012-0265-2

Bacon, F. T. (1979). Credibility of repeated statements: Memory for trivia. *Journal of Experimental Psychology: Human Learning and Memory*, *5*(3), 241-252. https://doi.org/10.1037/0278-7393.5.3.241

Brashier, N. M., Eliseev, E. D., & Marsh, E. J. (2020). An initial accuracy focus prevents illusory truth. *Cognition, 194,* 104054. https://10.1016/j.cognition.2019.104054

Corneille, O., Mierop, A., & Unkelbach, C. (2020). Repetition increases both the perceived truth and fakeness of information: An ecological account. *Cognition, 205,* 104470. https://doi.org/10.1016/j.cognition.2020.104470

Dechêne, A., Stahl, C., Hansen, J., & Wänke, M. (2010). The Truth About the Truth: A Meta-Analytic Review of the Truth Effect. *Personality and Social Psychology Review*, *14*(2), 238-257. https://doi.org/10.1177/1088868309352251

Del Vicario, M., Bessi, A., Zollo, F., Petroni, F., Scala, A., Caldarelli, G., … Quattrociocchi, W. (2016). The spreading of misinformation online. *Proceedings of the National Academy of Sciences, 113*(3), 554–559. https://10.1073/pnas.1517441113

DiFonzo, N., Beckstead, J., Stupak, N., & Walders, K. (2016). Validity judgments of rumors heard multiple times: The shape of the truth effect. *Social Influence, 11*(1), 22-39. https://doi.org/10.1080/15534510.2015.1137224

Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39*(2), 175191. https://doi.org/10.3758/BF03193146

Fazio, L. K. (2020). Repetition Increases Perceived Truth Even for Known Falsehoods. *Collabra: Psychology, 6*(38). https://doi.org/10.1525/collabra.347

Fazio, L., Pillai, R., & Patel, D. (2021). *The effects of repetition on belief in naturalistic settings*. PsyArXiv. https://doi.org/10.31234/osf.io/r85mw

Fazio, L. K., Brashier, N. M., Payne, B. K., & Marsh, E. J. (2015). Knowledge does not protect against illusory truth. *Journal of Experimental Psychology: General, 144*(5), 993-1002. https://doi.org/10.1037/xge0000098

Fazio, L. K., Rand, D. G., & Pennycook, G. (2019). Repetition increases perceived truth equally for plausible and implausible statements. *Psychonomic Bulletin & Review, 26*(5), 1705-1710. https://doi.org/10.3758/s13423-019-01651-4

Hasher, L., Goldstein, D., & Toppino, T. (1977). Frequency and the Conference of Referential Validity. *Journal of Verbal Learning and Verbal Behavior, 16*(1), 107-112. https://doi.org/10.1016/S0022-5371(77)80012-1

Hassan, A., & Barber, S. J. (2021). The effects of repetition frequency on the illusory truth effect. *Cognitive Research: Principles and Implications, 6,* 38. https://doi.org/10.1186/s41235-021-00301-5

Henderson, E. L., Simons, D. J., & Barr, D. J. (2021). The trajectory of truth: A longitudinal study of the illusory truth effect. *Journal of Cognition*, *4*(1), 1-23. https://doi.org/10.5334/joc.161

Henderson, E. L., Westwood, S. J., & Simons, D. J. (2021). A reproducible systematic map of research on the illusory truth effect. *Psychonomic Bulletin & Review*. https://doi.org/10.3758/s13423-021-01995-w

Henninger, F., Shevchenko, Y., Mertens, U., Kieslich, P. J., & Hilbig, B. E. (2021). *lab.js: A free, open, online study builder*. PsyArXiv. *Behavior Research Methods.* https://doi.org/10.3758/s13428-019-01283-5

Hilbig, B. E. (2012). How framing statistical statements affects subjective veracity: Validation and application of a multinomial model for judgments of truth. *Cognition, 125*, 37-48. https://doi.org/10.1016/j.cognition.2012.06.009

Lange, K., Kühn, S., & Filevich, E. (2015). Correction: "Just Another Tool for Online Studies" (JATOS): An Easy Solution for Setup and Management of Web Servers Supporting Online Studies. *PLOS ONE*, *10*(7), e0134073. https://doi.org/10.1371/journal.pone.0134073

Pennycook, G., Cannon, T. D., & Rand, D. G. (2018). Prior exposure increases perceived accuracy of fake news. *Journal of Experimental Psychology: General, 147*(12), 1865–1880. https://10.1037/xge0000465

Reber, R., & Schwarz, N. (1999). Effects of Perceptual Fluency on Judgments of Truth. *Consciousness and Cognition*, *8*(3), 338-342. https://doi.org/10.1006/ccog.1999.0386

Rouder, J. N., Speckman, P. L., Sun, D., Morey, R. D., & Iverson, G. (2009). Bayesian t tests for accepting and rejecting the null hypothesis. *Psychonomic Bulletin & Review, 16*(2), 225–237. https://doi.org/10.3758/pbr.16.2.225

Schnuerch, M., Nadarevic, L., & Rouder, J. N. (2020). The truth revisited: Bayesian analysis of individual differences in the truth effect. *Psychonomic Bulletin & Review, 28*(3), 750-765. https://doi.org/10.3758/s13423-020-01814-8

Schwartz, M. (1982). Repetition and rated truth value of statements. *American Journal of Psychology, 95*(3), 393-407. https://doi.org/10.2307/1422132

Silva, R. R., Garcia-marques, T., & Mello, J. (2016). The differential effects of fluency due to repetition and fluency due to color contrast on judgments of truth. *Psychological Research*, *80*(5), 821-837. https://doi.org/10.1007/s00426-015-0692-7

Unkelbach, C. (2007). Reversing the Truth Effect: Learning the Interpretation of Processing Fluency in Judgments of Truth. *Journal of Experimental Psychology. Learning, Memory, and Cognition*, *33*(1), 219-230. https://doi.org/10.1037/0278-7393.33.1.219

Unkelbach, C., & Greifeneder, R. (2018). Experiential fluency and declarative advice jointly inform judgments of truth. *Journal of Experimental Social Psychology, 79*, 78–86. https://doi.org/10.1016/j.jesp.2018.06.010

Unkelbach, C., Koch, A., Silva, R. R., & Garcia-Marques, T. (2019). Truth by Repetition: Explanations and Implications. *Current Directions in Psychological Science*, *28*(3), 247-253. https://doi.org/10.1177/0963721419827854

Unkelbach, C., & Speckmann, F. (2021). Mere repetition increases belief in factually true COVID-19 related information. *Journal of Applied Research in Memory and Cognition, 10*(2), 241-247. https://doi.org/ 10.1016/j.jarmac.2021.02.001

Unkelbach, C., & Stahl, C. (2009). A multinomial modeling approach to dissociate different components of the truth effect. *Consciousness and Cognition, 18*(1), 22-38. https://doi.org/10.1016/j.concog.2008.09.006

Vosoughi, S., Roy, D., & Aral, S. (2018). The spread of true and false news online. *Science, 359*(6380), 1146-1151. https://doi.org/10.1126/science.aap9559