Brief article

Mnemonic accessibility affects statement believability: The effect of listening to others selectively practicing beliefs

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ABSTRACT

Belief endorsement is rarely a fully deliberative process. Oftentimes, one's beliefs are influenced by superficial characteristics of the belief evaluation experience. Here, we show that by manipulating the mnemonic accessibility of particular beliefs we can alter their believability. We use a well-established socio-cognitive paradigm (i.e., the social version of the selective practice paradigm) to increase the mnemonic accessibility of some beliefs and induce forgetting in others. We find that listening to a speaker selectively practicing beliefs results in changes in believability. Beliefs that are mentioned become mnemonically accessible and exhibit an increase in believability, while beliefs that are related to those mentioned exrience mnemonic suppression, which results in decreased believability. Importantly, the latter effect occurs regardless of whether the belief is scientifically accurate or inaccurate. Furthermore, beliefs that are endorsed with moderate-strength are particularly susceptible to mnemonically-induced believability changes. These findings, we argue, have the potential to guide interventions aimed at correcting misinformation in vulnerable communities.

1. Introduction

Does ingesting sugar cause hyperactivity in children? The belief that it does is widespread in the population, despite scientific evidence to the contrary. On the one hand, answering the question in the affirmative could be because one has information that is supportive of the belief. On the other hand, belief endorsement could be due to superficial characteristics of the belief evaluation experience. Among these superficial characteristics, the ease with which information comes to mind has been found to influence one's judgments (Tversky & Kahneman, 1973). This ease of retrieval is taken as an internal cue as to whether one endorses it: high endorsement if the belief comes to mind easily, low endorsement otherwise.

Most of the experimental studies aimed at exploring the relation between memory and belief focuses on the up-regulation of memory. That is, increasing a belief's mnemonic accessibility has been shown to result in its increased believability (Ozubko & Fugelsang, 2011). No research to date has explored how the down-regulation of memory (i.e., mnemonic suppression) can lead to corresponding changes in belief endorsement. This latter investigation is important for both theoretical and practical reasons. On the theoretical side, the argument that mnemonic accessibility causally influences believability has to necessarily explore both sides of the mnemonic accessibility continuum:

up-regulation and down-regulation. On the practical side, at a societal level decreasing the believability of inaccurate beliefs in the population might be as important as increasing the believability of accurate beliefs.

To explore the relation between mnemonic down-regulation and believability, we build on a well-established literature that shows that selective practice of previously encoded information can result in better memory for practiced information – a rehearsal effect - and can also induce forgetting in unmentioned, but related to the mentioned information – a retrieval-induced forgetting effect (Anderson, Bjork, & Bjork, 1994). In a typical selective practice paradigm, participants first study category-exemplar pairs (e.g., the "*Nutrition*" category contains the "*Carrots are rich in vitamins*" and "*Broccoli is rich in iron*" exemplars; the "*Hydration*" category contains the "*Milk is rich in calcium*" and "*Coconut water is rich in potassium*" exemplars) and then receive selective practice for half of the exemplars from half of the categories by way of a stem completion task (e.g., "*Carrots are rich in v__*"). Analyses of a final cued-recall test show that practiced items (Rp+ items: *Nutrition-Carrots/Vitamins*) are remembered better than unpracticed unrelated items (Nrp items: the exemplars in the *Hydration category*)—a rehearsal effect. Unpracticed items related to those practiced (Rp− items: *Nutrition-Broccoli/Iron*) are remembered worse than Nrp items—a retrieval-induced forgetting effect (RIF). The rehearsal effect has been explained by trace strengthening (Karpicke & Roediger, 2008), whereas

RIF is thought to arise because of inhibitory processes triggered by response competition during the practice phase (Kuhl, Dudukovic, Kahn, & Wagner, 2007; but see Mensink & Raaijmakers, 1988). Of note, RIF is a well-established phenomenon that is reliably obtained with various stimulus materials and delay intervals (Murayama, Mityatsu, Buchli, & Storm, 2014, for a meta-analysis). It has also been consistently found when the selective practice of information occurs in a conversational setting (Coman, Manier, & Hirst, 2009). That is, when listeners monitor the speaker selectively practicing previously encoded information they experience what Cuc, Koppel, and Hirst (2007) call socially-shared retrieval-induced forgetting. This phenomenon, they showed, is due to the fact that under certain circumstances, listeners concurrently retrieve the information along with the speaker, which, like in the case of RIF, triggers response competition from related memories.

In the current study we reasoned that the easiness with which a belief comes to mind should affect its believability. The two cognitive processes triggered by selective retrieval practice (i.e., strengthening and suppression) should lead to corresponding effects on believability. Because repeated exposure to a belief leads to increased mnemonic accessibility, one would expect an increase in its believability, a prediction consistent with research on the illusory truth effect (Fazio, Brashier, Payne, & Marsh, 2015). At the same time, beliefs related to those practiced should experience suppression of their mnemonic representations, which should in turn result in decreased believability.

But not all information can be suppressed. Recent research has found that moderately activated memories are most susceptible to forgetting (Newman & Norman, 2010; Poppenk & Norman, 2014). This is due to the fact that weakly activated memories do not have the strength to trigger competition among memory traces, while highly activated memories are too strong to experience suppression. During the selective practice phase, therefore, weakly activated Rp− memories are unlikely to compete for activation, while strongly activated Rp− memories will exceed the activation threshold. For these reasons, neither should experience suppression following selective practice. Transferring this reasoning in the domain of beliefs, it follows that only moderately held beliefs should experience suppression following selective practice. In other words, if one strongly endorses or strongly opposes the belief that "sugar makes kids hyperactive," than this endorsement/opposition might make the belief chronically accessible, and, therefore, less susceptible to suppression.

Several findings in the retrieval-induced forgetting literature are consistent with this prediction. Evidence for a relation between belief strength and probability of retrieval comes from research on memory for stereotypes. Dunn and Spellman (2003) found that the more strongly participants endorsed a stereotype, the less suppression of stereotype-relevant information they exhibited. Similarly, Coman and Hirst (2012) found that the participants who held extreme views on a topic (i.e., legalization of euthanasia) were less likely to experience retrieval-induced forgetting in topic-relevant information compared to participants who held moderate views. Based on this research we hypothesize that only moderately-held beliefs will be susceptible to forgetting and its hypothesized believability decrement. To test these hypotheses, we conducted two studies. After collecting data for the main study between October 2017 and January 2018, we conducted an exact replication study between March and May (2018) with a separate sample of participants recruited from the same population (i.e., Princeton students).

2. Methods

2.1. Participants

2.1.1. Main study

To detect a moderate effect size of 0.30 for paired-sample comparisons with 0.80 power, we collected data from 80 participants. Pilot testing the procedure indicated that finishing the task in less that 15 min constituted inadequate study engagement. We therefore used this pre-established criterion to discard participants. The final sample was comprised of 58 participants affiliated with Princeton University (66% women; Mean-Age = 21.76).

2.1.2. Replication study

For the replication study, we recruited 100 participants, with similar calculations for the projected sample size. Eighty-eight participants affiliated with Princeton University (56% women; Mean-Age = 20.58) completed the study and passed our pre-established exclusion criterion.

2.2. Stimulus materials

A set of 24 statements distributed in four categories (i.e., *nutrition, allergies, vision, health*) was selected to be used in the main study (Appendix A). Each category was comprised of 2 myths and 4 correct pieces of information. The myths were comprised of statements commonly endorsed by individuals as true, but in fact are false, whereas the facts were scientifically accurate statements. For example, a myth was that "reading in dim light can damage children's eyes," while an
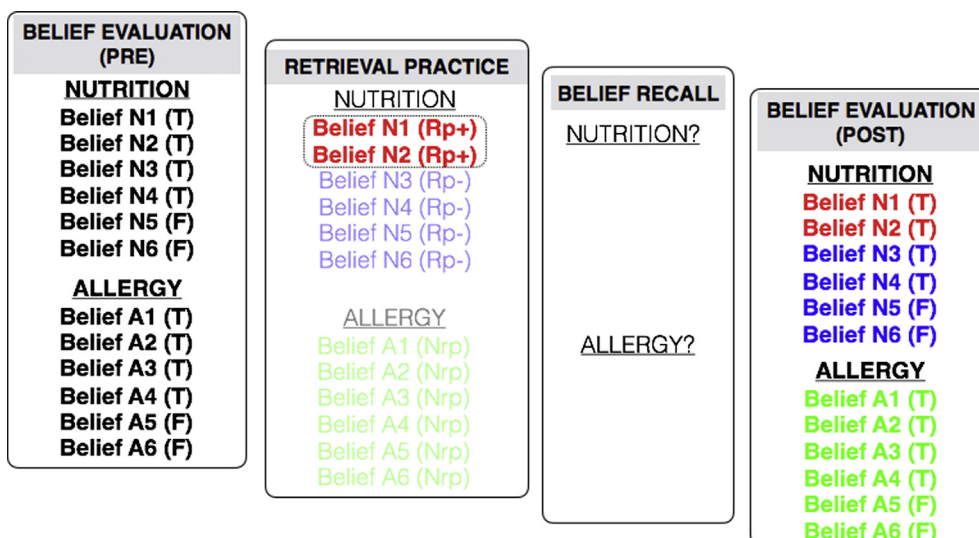

Fig. 1. An illustration of the phases of the experimental procedure. Presented here, only 2 categories in the study phase (from a total of 4). Belief N1 corresponds to one statement in the Nutrition category and the T and F designation stands for true (accurate statement) and false (myth), respectively. In the Retrieval Practice phase and in the Belief Evaluation-Post, the color scheme indicates Rp+ beliefs (red), Rp− beliefs (blue), and Nrp beliefs (green). The Rp+ statements were the only statements included in the audio (the Rp− and Nrp beliefs are shaded to indicate that they were not mentioned in the practice phase). (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

accurate statement was that "children who spend less time outdoors are at greater risk to develop myopia." Based on a separate pilot study with 112 MTurk participants, the myths and correct pieces of information were selected such that they were not different on believability, perceived scientific support, and personal relevance. In addition, we selected the categories for which the items were correctly categorized as being part of a category by more than 75% of the sample (Appendix B).

2.3. Design and procedure

The study included 4 phases (Fig. 1). In the study/evaluation phase, participants were presented with 24 statements in a category-blocked fashion. The order of presentation of the categories, as well as the order of statements within the category was random. Participants were instructed to carefully read these statements that are, supposedly, "frequently encountered on the internet." In this phase, they rated the degree to which they believe each statement is accurate (from 1-*Not at all* to 7-*Very much so*) and has scientific support (from 1-*Definitely not* to 7-*Definitely yes*).

Next, participants went through a selective practice phase. They listened to an audio of a participant who, supposedly, remembered the information he/she was exposed to during our experiment in a previous session. In the audio, the speaker (a confederate) recalled the statements with minor hesitations to indicate a naturalistic recall. The participants (listeners) were asked to carefully monitor the speaker's utterances for whether the speakers were accurately remembering the initially studied statements. Each participant listened to a gender-matched audio containing half of the correct statements (i.e., 2 statements) from half of the categories (i.e., 2 categories), for a total of 4 statements. Counterbalancing the selectively practiced stimuli ensured that every correct statement was equally likely to be RP+ (beliefs mentioned in the audio), RP− (beliefs in the same category as those mentioned in the audio, but not mentioned themselves), or NRP (beliefs that were not mentioned in the audio and were unrelated to those mentioned). RP+ beliefs were always correct. In each category, RP− beliefs were either correct (2 beliefs) or incorrect (2 beliefs). Similarly, NRP items were either correct (4 beliefs) or incorrect (2 beliefs) (Fig. 1).

Participants were then asked to recall the information in a cued-recall task. They were given the category name (e.g., Nutrition) and were instructed to remember the initially studied statements. Finally, in a belief post-test phase, participants were randomly presented with the initially read statements and were asked to rate them on the same two scales as before (i.e., accuracy and scientific support).

2.4. Analyses and coding

Each statement was coded as successfully remembered if the recall captured the gist of the original statement. For instance, if for the studied item "Crying helps babies' lungs develop," participants remembered "Crying is good for the lungs," their recall was coded as accurate, since it captures the gist of the original statement. Ten percent of the data were double-coded for reliability (Main study kappa = 0.87; Replication study kappa = 0.87) and all disagreements were resolved through discussion. All reported statistical analyses are computed following the guidelines and corrections described in Lakens (2013).

2.5. Supplementary material

Data for both the main study and the replication study can be found on the Open Science Foundation website at: osf.io/xe6nd (Coman, 2018).

3. Results

The results were highly consistent between the main study and the replication study. We report the statistical analyses from the main study and we briefly summarize the results of the replication study. For an exhaustive reporting of the statistical analyses conducted on the replication study data see Supplementary Materials.

Supplementary data associated with this article can be found, in the online version, at https://doi.org/10.1016/j.cognition.2018.07.015.

First, we wanted to establish whether there is any difference in believability between the accurate statements and the myths in the initial belief evaluation phase. Because the correlation between a statement's believability and its perceived scientific evidence was high (r = 0.80) we averaged the two scores to compute a believability index. A paired-sample *t*-test comparing the believability indices of facts (M = 4.03, SD = 0.69) and myths (M = 3.88, SD = 0.79) revealed no difference between them, t(57) = 1.28, d = 0.17, p = 0.203. In subsequent analyses, we combine the facts and myths, but note that we conducted analyses separately for facts/myths and the pattern of results shows no significant differences between the two. This is consistent with the fact that from the perspective of our participants they were indistinguishable.

The impact of selectively practicing beliefs on memory. To explore whether the selective practice phase had an effect on the participants' memories of the statements, we conducted a Repeated-Measures ANOVA with Retrieval-Type (Rp+ vs. Rp− vs. Nrp) as a within-subjects variable, and recall proportion as the dependent variable. We found a significant main effect for Retrieval-Type, *F*(2, 56) = 23.63,
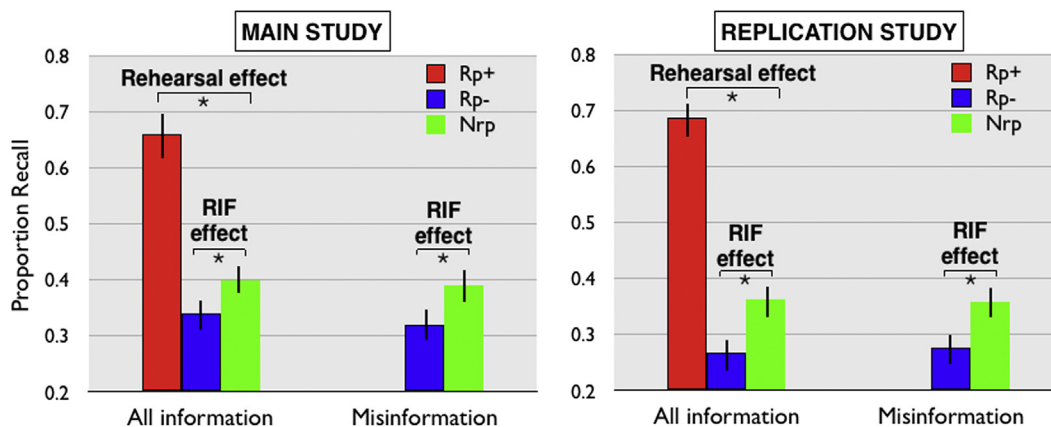

Fig. 2. Recall proportion in the final recall phase by retrieval type: items mentioned in the audio (Rp+ items); items related to those mentioned (Rp−); items unmentioned and unrelated to those mentioned (Nrp items). On the left panel: data from the main study; on the right panel, data from the replication study. The error bars represent the standard error around the mean.

$p < .001$, $\eta_p^2 = 0.46$. Post-hoc analyses revealed a rehearsal effect, with the recall proportion of Rp+ items ($M = 0.66$, $SD = 0.31$) significantly higher than the recall proportion of Nrp items ($M = 0.40$, $SD = 0.16$), $t(57) = 6.47$, $p < .001$, $d = 0.86$, CI[0.18, 0.34]. We also found a retrieval-induced forgetting effect, with the recall proportion of Rp− items ($M = 0.34$, $SD = 0.20$) significantly lower than the recall proportion of Nrp items ($M = 0.40$, $SD = 0.16$), $t(57) = 2.15$, $p < .036$, $d = 0.28$, CI[0.00, 0.12]. A similar effect size was found for retrieval-induced forgetting when we restricted the analyses to the misinformation items, with Rp− items ($M = 0.31$, $SD = 0.23$) remembered significantly lower than Nrp items ($M = 0.39$, $SD = 0.23$), $t(57) = 2.22$, $p < .030$, $d = 0.29$, CI[0.00, 0.15]. We thus replicated previous research showing that selectively practicing information leads to the strengthening of the retrieved information and the retrieval-induced forgetting of unmentioned, but related to the mentioned information.

The replication study exhibited a more pronounced pattern in the hypothesized direction, given that we had a more adequate sample size to detect an effect (Fig. 2; Supplementary Materials).

We further hypothesized that moderate beliefs will be more susceptible to forgetting than either low-strength or high-strength beliefs. To investigate this hypothesis, we categorized, for each participant, the 24 beliefs depending on their strength. To do so, we used the belief evaluation from the study/evaluation phase to compute within-participant z-scores. That is, for each participant, the set of 24 belief scores from the encoding phase constituted the pool of scores used for standardization. We used cutoff scores to split the beliefs in participant-specific High-Strength beliefs (z-scores > 0.5; MRawScore = 5.65, SD = 0.80), Moderate-Strength beliefs (z-scores between 0.5 and −0.5; MRawScore = 4.03, SD = 0.81), and Low-Strength beliefs (z-scores < −0.5; MRawScore = 2.23, SD = 0.83), such that, on average, across participants, 33% of a participant's beliefs fell in each of the three belief strength categories.

We next conducted paired-sampled t-tests, separately for the rehearsal and RIF effects for each belief-strength. We found a reliable rehearsal effect for low-strength beliefs, $t(41) = 2.40$, $p < .021$, $d = 0.38$, CI[0.03, 0.37], moderate-strength beliefs, $t(45) = 3.26$, $p < .002$, $d = 0.49$, CI[0.09, 0.39], and high-strength beliefs, $t(46) = 2.66$, $p < .010$, $d = 0.39$, CI[0.05, 0.37]. Regardless of belief strength, if one listens to another person repeat the belief, then one is likely to better remember it subsequently. As predicted, we only found a RIF effect for Moderate-Strength beliefs, $t(53) = 2.24$, $p < .029$, $d = 0.31$, CI[0.01, 0.25], and not for Low-Strength (p = .377) or for High-Strength (p = .324) beliefs. The same results emerged in the replication study, with the magnitude of the effect size slightly larger than that in the main study (Fig. 4; Supplementary Materials).

The impact of selectively practicing beliefs on believability. To explore whether rehearsal and RIF effects impact statement believability, we computed the change in belief endorsement as a function of whether the item was an Rp+, Rp−, or Nrp item during the selective practice phase. We maintained the designation of High-Strength/Moderate-Strength/Low-strength beliefs based on the pre-test phase and we computed post-test belief z-scores for each participant. That is, for each participant, the 24 beliefs that they evaluated in the post-test constituted the set of belief scores that were used for within-individual standardization. For a measure of belief strength change, we subtracted each belief's pre-test z-score from its post-test z-score (Fig. 3). The more positive this belief change score - the more believable the belief became after the selective practice phase than before; the more negative the belief change score - the less believable the belief became after the selective practice phase than before. It is important to note that we used standardized scores for this analysis to avoid fatigue or habituation effects from pre to post-evaluation.

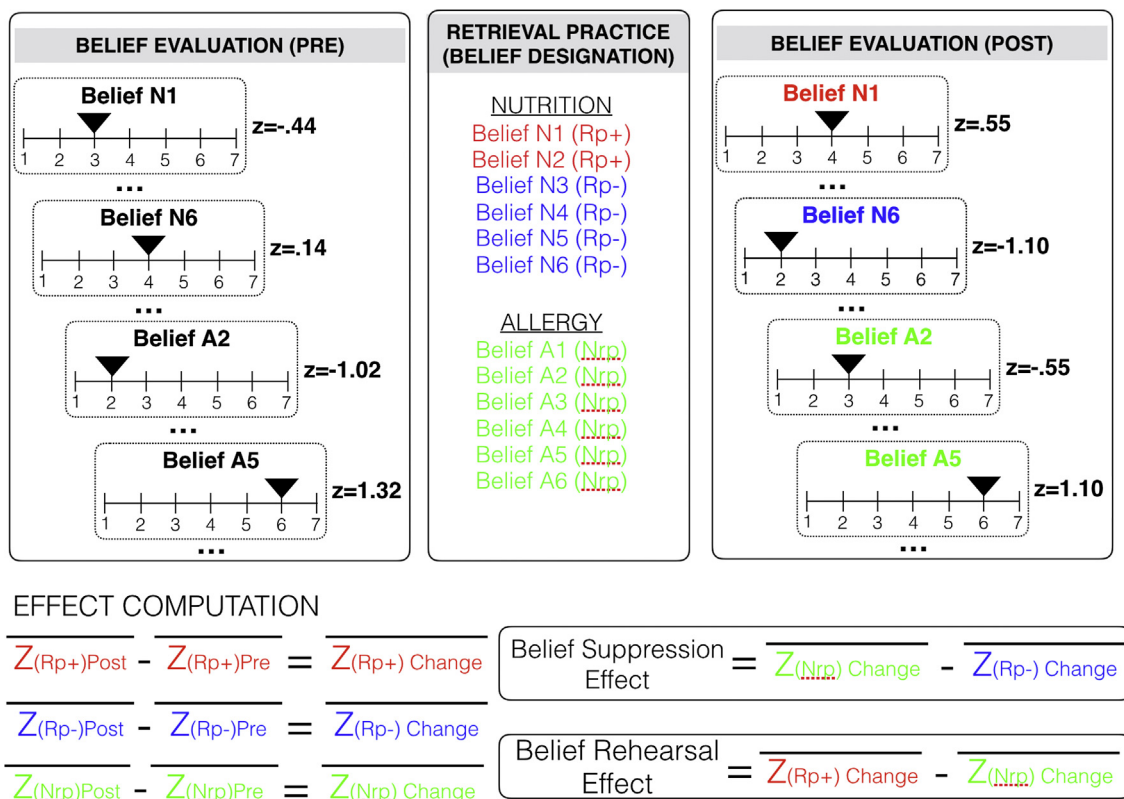We conducted a Repeated-Measures ANOVA with Retrieval-Type

Fig. 3. Procedure used for belief rating standardization. In the top panel, hypothetical data for one participant, with standardization procedure and belief designation by retrieval type (Rp+, Rp−, and Nrp). Note that designation into belief strength category (Low, Moderate, and High) based on the standardized scores occurred in the Belief Evaluation Phase (Pre). In the bottom panel, the computation of the Belief Suppression (difference between Nrp pre-post change and Rp− pre-post change) and Belief Rehearsal (difference between Nrp pre-post change and Rp+ pre-post change) effects.
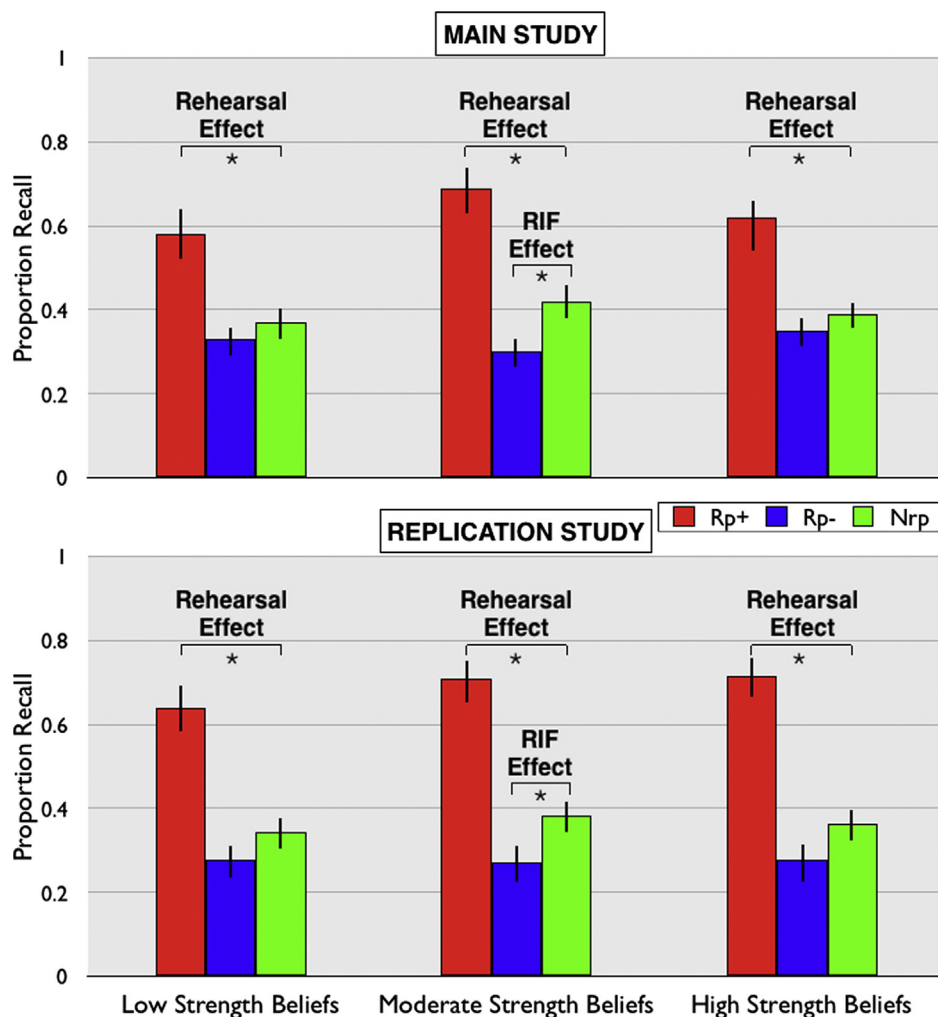
Fig. 4. Recall proportion in the final recall phase by retrieval type (Rp+, RP−, and Nrp), separate for Low-Strength beliefs, Moderate-Strength beliefs, and High-Strength beliefs. On the left panel: data from the main study; on the right panel, data from the replication study. The error bars represent the standard error around the mean.

(Rp+ vs. Rp− vs. Nrp) and Belief-Strength (High vs. Moderate vs. Low) as within-subjects variable, and belief change as the dependent variable. We found a significant main effect for Retrieval-Type, $F(2, 18) = 3.81$, $p < .042$, $\eta_p^2 = 0.30$ and for Belief-Strength, $F(2, 18) = 15.80$, $p < .001$, $\eta_p^2 = 0.64$. We also found an interaction between Retrieval-Type and Belief-Strength, $F(4, 16) = 3.59$, $p < .028$, $\eta_p^2 = 0.47$. In exploring the interaction, we focused on comparisons involving Rp+ beliefs and Nrp beliefs (belief rehearsal effect) and Rp− beliefs and Nrp beliefs (belief suppression effect). For the belief rehearsal effect, the Rp+ High-Strength beliefs decreased in believability from pre to post-evaluation ($M = -0.08$, $SD = 0.36$) to a smaller extent than the Nrp High-Strength beliefs ($M = -0.36$, $SD = 0.39$), $t(46) = 3.61$, $p < .001$, $d = 0.53$, CI[0.12, 0.44]. Similarly, the Rp+ Moderate-Strength beliefs increased in believability from pre to post-evaluation ($M = 0.21$, $SD = 0.58$) more than the Nrp Moderate-Strength beliefs ($M = -0.12$, $SD = 0.44$), $t(46) = 2.98$, $p < .004$, $d = 0.44$, CI[0.11, 0.55]. The pattern of results for High and Moderate-Strength beliefs showcases, thus, a belief rehearsal effect. We found no significant belief rehearsal effect for the Low-Strength beliefs, with the belief change in Rp+ beliefs ($M = 0.55$, $SD = 0.82$) larger than that for Nrp beliefs ($M = 0.33$, $SD = 0.39$), as predicted, but not significantly so, $t(43) = 1.51$, $p = .138$, $d = 0.23$, CI[−0.07, 0.51]. These results suggest that monitoring a speaker repeating beliefs increases their believability, but only if one believes them at least moderately.

Finally, we explored whether retrieval-induced forgetting resulted

in diminished endorsement of un-mentioned, but related to the mentioned beliefs. As predicted, we found a belief suppression effect only for Moderate-Strength beliefs, with the Rp− beliefs decreasing in believability from pre to post-evaluation ($M = -0.29$, $SD = 0.40$) significantly more than the Nrp beliefs ($M = -0.11$, $SD = 0.46$), $t(53) = 2.05$, $p < .045$, $d = 0.28$, CI[0.00, 0.36]. The Low-Strength beliefs and the High-Strength beliefs did not show diminished endorsement following selective practice. This is consistent with the pattern of recall that we explored above, suggesting that the suppression of mnemonic representations associated with particular beliefs diminishes their believability.

The replication study exhibited a similar pattern for moderately held beliefs (Fig. 5; Supplementary Materials). Notably, the belief rehearsal effect for low-strength beliefs that only showed a statistical trend in the main study became highly significant in the replication study ($p < .001$), while the significant rehearsal effect for high-strength beliefs that was statistically significant in the main study was no longer present in the replication study. We speculate that these differences might have been due to the fact that the low-strength beliefs in the replication study were endorsed significantly less (MRawScore = 1.58, SD = 0.49) than the low-strength beliefs in the main study (MRawScore = 2.23, SD = 0.83) ($p < .001$), which made the selective practice of these beliefs more consequential in the replication study. Similarly, the high-strength beliefs were endorsed much more in the replication study (MRawScore = 6.43, SD = 0.50) than in the main
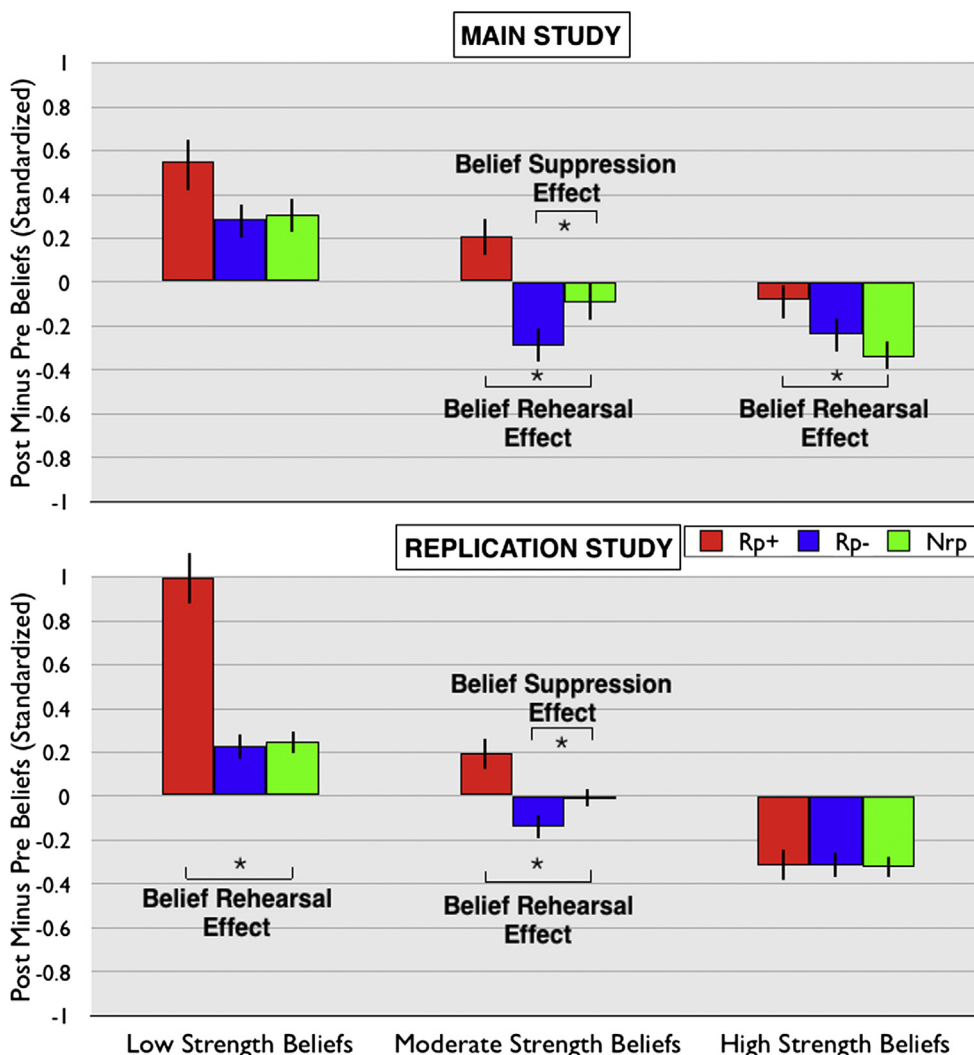
Fig. 5. Pre-Post belief change scores by retrieval type (Rp + , Rp − , and Nrp), separate for Low-Strength beliefs, Moderate-Strength beliefs, and High-Strength beliefs. The error bars represent the standard error around the mean.

study (MRawScore = 5.65, SD = 0.80), (p < .001), which made the selective practice of these beliefs non-consequential in the replication study, since they were already highly endorsed.

4. Discussion

People constantly communicate with one another about their beliefs. We show here that monitoring others mentioning beliefs affect the listeners in meaningful ways: they increase their mnemonic accessibility for the mentioned beliefs and decrease accessibility for unmentioned, related beliefs. This change in mnemonic accessibility, in turn, affects their believability, such that rehearsed beliefs become more believable and suppressed beliefs become less believable. Two important qualifications of this conclusion are in order. First, we obtained these results with participants who were engaged in the experimental task, given our pre-established exclusion criteria. This limits, to some degree, the generalization of this conclusion to the population at large. We believe that it is fair to conclude, though, that given at least a moderate level of engagement, one could reasonably expect these results to hold in the general population. And second, the belief suppression effect only happens for moderately-held beliefs, a finding consistent with previous work that shows forgetting for moderately activated memories (Newman & Norman, 2010). Beyond its theoretical importance, this finding suggests that in communities in which

inaccurate beliefs are widely circulated, one would be well-served to know which beliefs could be most susceptible to change through mnemonic accessibility strategies.

The research presented here opens intriguing research trajectories. First, in the current study selective practice is implemented with the use of an implied ingroup social source (i.e., speaker in the audio thought to be another Princeton-affiliated participant). An extensive social psychological research has shown that the characteristics of the source have a critical impact when it comes to belief endorsement (Pornpitakpan, 2004)). We conjecture that programmatically manipulating the profile of the source – e.g., political ideology, trustworthiness, expertise – will likely affect both the memories of the mentioned and unmentioned information (Coman & Hirst, 2015) as well as the believability associated with this information in predictable ways.

Second, extending these findings from a local setting involving dyadic exchanges to a community level, where individuals interact with one another as part of networked communities has the potential to reveal the dynamics associated with collective beliefs (Coman, Momennejad, Geana, & Drach, 2016). Using a similar procedure, but now, in lab-created communities, we have replicated our belief rehearsal/suppression effects with a paradigm that involves repeated interactions in 12-member communities (Vlasceanu, Morais, Duker, & Coman, 2018). The dyadic level effects explored in the current study were found to lead to community-wide converge on similar beliefs

following conversational interactions. This extension is particularly meaningful for policy makers interested in having an impact at a community level (Dovidio & Esses, 2007).

Finally, the current findings are relevant in the context of interventions aimed at countering the spread of misinformation in vulnerable communities (Coman & Berry, 2015; Schwarz, Sanna, Skurnik, & Yoon, 2007). Existing interventions involve information campaigns that typically attempt to counter false information by refuting it (Wegner,

Wenzlaff, Kerker, & Beattie, 1981). Even though these campaigns are generally successful (Lewandowsky, Ecker, Seifert, Schwarz, & Cook, 2012; Wood & Porter, 2018), under certain conditions they have been found to reinforce misconceptions (Cook, Ecker, & Lewandowsky, 2015). Supplementing existing interventions with alternative strategies (i.e., suppressing false beliefs through retrieval-induced forgetting), will add to the tools that policy makers and communicators could use to dispel misinformation at a societal level.

Appendix A

1. Nutrition:
     Fact 1. Fat intake in babies is good for healthy development.
     Fact 2. Infants drinking cow milk instead of being breastfed are at risk for anemia.
     Fact 3. Infants being breastfed by women that are not their mothers have higher risks of getting sick.
     Fact 4. Dairy consumption is linked to constipation in children.
     Myth 1. Sugar makes kids hyper.
     Myth 2. Soy milk causes constipation in children.
2. Allergies:
     Fact 1. Food allergies are more common in children of families with a history of allergies.
     Fact 2. Women should not avoid allergenic foods during pregnancy and breast-feeding in order to lower their child's risk of allergies.
     Fact 3. Dust mites are one of the most common cause of allergies in children.
     Fact 4. Children can outgrow peanut allergies.
     Myth 1. Introducing potential allergens like peanuts should be held off until babies are at least 12 months old.
     Myth 2. Some babies are allergic to their mother's milk.
3. Vision:
     Fact 1. A child's untreated wandering eye can lead to permanent vision loss in that eye.
     Fact 2. Most learning disabilities in children are associated with vision problems.
     Fact 3. Children who spend less time outdoors are at greater risk to develop myopia (nearsightedness).
     Fact 4. Children with diabetes are at risk of developing eye disease that can affect their vision.
     Myth 1. Reading in dim light can damage children's eyes.
     Myth 2. Eating carrots will make babies eyesight sharper.
4. Health:
     Fact 1. Pneumonia is the prime cause of death in children.
     Fact 2. It is not the height of the temperature but rather the sudden spike in temperature that may lead to a convulsion in feverish babies.
     Fact 3. A child's risk of dying is highest in the first month of life.
     Fact 4. The majority of people infected with malaria are children.
     Myth 1. Crying helps babies' lungs develop.
     Myth 2. Babies with ear infections are not going to get better on their own, they should be treated with antibiotics.

Appendix B

A pilot study was conducted to select the belief statements to be used in the main study. A set of 50 statements with information regarding child rearing (20 myths and 30 facts) were selected for pre-testing. The myths were comprised of statements commonly endorsed by individuals as true, but in fact are demonstrably false, whereas the facts were scientifically accurate statements. These 50 statements were grouped in five conceptual categories and were rated by 112 MTurk participants who were not part of the main experiment. The categories included: *nutrition, allergies, vision, health*, and *psychological facts*, and the ratings involved 1–7 Likert scales on: perceived accuracy, perceived scientific support, and personal relevance, and one measure of category belongingness.

Based on the pilot study, a subset of 24 statements distributed in four categories (2 myths and 4 correct pieces of information in each category) were selected to be used in the main study (Appendix A). The myths and correct pieces of information were selected such that they were not statistically significantly different on believability, perceived scientific support, and personal relevance. In addition, we selected the categories for which the items were correctly categorized as being part of a category by more than 75% of the sample.

	Myths (Mean/SD)	Facts (Mean/SD)	P value
Perceived Accuracy	M = 4.53, SD = 0.36	M = 4.45, SD = 0.65	p = .75
Perceived scientific support	M = 4.62, SD = 0.31	M = 4.57, SD = 0.61	p = .84
Perceived relevance	M = 3.42, SD = 0.46	M = 3.21, SD = 0.41	p = .28
Category belongingness	M = 79.66%, SD = 17.96	M = 83.54%, SD = 14.88	p = .58

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