

The Role of Belief Perseverance and Forewarning in Dismissing Facts

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Abstract

Belief perseverance is defined as the extent people continue to hold on to old beliefs, even when presented with new information. The present study extends research on the subject by testing if belief perseverance will lead participants to believe whether or not results of discredited research can still be applied to future research studies. In both studies, participants read scenarios in which threatened children either found a toy more or less preferable than children who were not threatened. In Study 1, results showed that failing to replicate original results of the study would create distrust for a new study created, showing belief perseverance was at work. In Study 2, some participants were told what belief perseverance was in order to test if we could decrease the effects of belief perseverance. Results showed that differences were lessened between participants in the more and less conditions when they were warned. Participants across all conditions (more vs. less and warning vs. no warning) said they were not affected by belief perseverance.

Keywords: belief perseverance, warning, confirmation bias, memory, replication failure

The Role of Belief Perseverance and Forewarning in Dismissing Facts

With an ever-increasing amount of information provided to us via the Internet and television, it's not surprising that incorrect information spreads quickly. People can use false or misconstrued information as a way to reinforce their biases. However, even when people read factual information, they still have the tendency to notice and interpret information that supports their pre-existing beliefs (Frost, Casey, Griffin, Raymundo, Farrell, & Carrigan, 2015; Cobb, Nyhan, & Reifler, 2013). As Bui (2014) stated, when we cling to our own beliefs and disregard contradictory evidence, we are exhibiting belief perseverance. In our study, we expect that belief perseverance will cause participants to believe results of prior discredited research still applies to a future research study.

Belief perseverance is a phenomenon that impacts all individuals, including psychiatrists and students (Mendel, Traut-Mattausch, Jonas, Leucht, Kane, Maino, Kissling, & Hamann, 2011). Mendel et al. (2011) give the example of a physician who focuses on confirming their hypothesis. A physician who makes a preliminary diagnosis only looks for symptoms that confirms their preliminary diagnosis. This means that the physician ignores conflicting information that could suggest another diagnosis. Mendel et al. state that making a wrong preliminary diagnosis would cause a physician to overlook the presence of something as deadly as a brain tumor due to confirmation bias. If we take current politics and biased news sources into consideration, they display the same type of behavior as biased physicians. Biased sources take advantage of belief perseverance because they know information that enforces beliefs is more attractive than information that challenges it. Belief perseverance is a cognitive schema, which helps people understand social situations (Bui, 2014). However, as Bui mentioned, these

schemas are difficult to alter because they exist independent from the information they came from.

Similarly, Guenther and Alicke (2008) argue that people want to maintain the most favorable self-image. Addressing a study by Ross et al. (1975), Guenther and Alicke state that people that receive positive feedback (even if told the feedback was fictitious) think of themselves more favorably than people that are given failure feedback. Their study was based on research that supports the notion that belief perseverance is what causes self-enhancement, the tendency for people to maintain positive and favorable self-views. Referring to both the research done by Mendel et al. and the self-enhancement theory, a heightened sense of competence has a destructive role in making a diagnosis. Belief perseverance allows people to disregard the probability of being incorrect and not question previously acquired knowledge and schemas. Belief perseverance is so powerful that some studies make participants aware of the impact of the participants' underlying assumptions by making them attend to, think about, or explain feedback and results of tests they are given (Guenther & Alicke, 2008).

Study One

To further explore belief perseverance, we organized a study that had participants read a short scenario involving how children rank toys. As mentioned, we predict that belief perseverance will lead participants to believe the findings of prior discredited research will still apply to a future research study. That is, if we tell participants a prior study found a threatened child ranked a forbidden toy lower than a non-threatened child, the participants will think that result will occur in a future study with a threatened child finding the toy less preferable compared to a non-threatened child. Alternatively, if participants are told that a prior study found a threatened child ranked a forbidden toy higher than a non-threatened child, our own participant

will think that result will occur in a future study with a threatened child finding the toy more preferable compared to a non-threatened child. Those told the prior study didn't find a difference between threatened and non-threatened children will think that there will be no difference in a future study. We expect similar results for questions regarding the replication of the study in Tampa, Florida. However, if belief perseverance is at work, we expect all of our participants to find our future study questionable if it fails to replicate the findings from the original study.

Methods

Participants

There were 145 students from Florida International University in our study. Of these participants, 65 were male (43.9%) and 80 were female (54.1%). The age of the sample ranged from 12 to 43 ($M = 24.01$, $SD = 6.05$). This included 25% Caucasian ($N = 37$), 51.4% Hispanic ($N = 76$), 3.4% Native American ($N = 5$), 6.1% African American ($N = 9$), 4.7% Asian ($N = 7$), and 7.4% of participants reporting "other" ($N = 11$).

Materials and Procedures

In agreement with standardized rules for informed consent, potential participants were informed of the benefits and risks associated with the study. Participants that were approached were FIU students, unknown to the researcher, and not enrolled in a psychology research methods class during the Spring 2017 semester. If the student verbally consented, they were randomly given one of three different documents, which contained our primary independent variable for the study.

One third of the participants were in the "more preferable" condition, one third were in the "less preferable" condition, and one third were in the "neutral or no preference" condition. To distinguish between which condition a participant was in, participants in the more preferable

condition had an “MP” at the bottom of each of their papers, participants in the less preferable condition had an “LP,” and participants in the neutral or no preference condition had an “NP.” Participants were then asked to read the instructions on the top of page one, which told them that we were interested in how they perceive and understand psychological research. The instructions also asked them to read the text carefully and to answer the questions that followed the research scenario.

Participants then read a research scenario that involved a child playing with a toy. All documents stated that the research looked at the impact that forbidding a child from playing with a toy had on a child’s rating of the toy preference. Participants then read that each of the children in the study were individually shown into a room that contained five toys, and that they were told that they could play with all five. After five minutes of playing with the toy, the experimenter in the study asked the child to point to which toy out of a pair they preferred. This allowed experimenters in the study to create a preference ranking for all toys from most to least preferred. Participants then read that the experimenter separated the toy the child found second most preferable and put it on the table, with the rest of the toys spread out on the floor. The experimenter said they had to leave and that they would be back in 10 minutes.

Before the experimenter left, they placed the child in a “threat” or “no threat” condition. In the no threat condition, the experimenter took the second-ranked toy with them when they left the room. In the “threat” condition, the experimenter placed the toy on the table, but told the child not to play with it or they would not let the child play with any of the other toys when they returned. None of the children in the threat and no threat conditions played with the forbidden toy. When the experimenter returned after 10 minutes, they got a second set of preference rankings for all five toys from the child. In our study, participants in the more preferable

condition were told the children in the threat condition found the forbidden toy more preferable than the children in the no threat condition. Our participants in the less preferable condition were told the children in the threat condition found the forbidden toy less preferable than the children in the no threat condition. Participants in the neutral preferable condition were told the children in the threat condition found the toy neither more nor less preferable than children in the no threat condition.

Participants were then given questions and were asked to circle their responses based on a scale from 1 to 7. These questions included if the results surprised them (1 = not at all surprising, 7 = very surprising), if they thought researchers would be able to replicate the results using a sample from Tampa Bay (1 = would not be replicated, 7 = would be replicated), and if they thought the methodology used in the study was scientific (1 = not at all scientific, 7 = very scientific). These questions were not the real focus of the study.

Our participants then read a second set of instructions that told them the results they just read were fictitious and asked them questions based on what they thought would happen when FIU researchers run the study. These questions included how participants thought children in the threat condition would rank the forbidden toy in comparison to the children in the no threat condition (-5 = less preferable, 5 = more preferable), how children in the threat condition will rank the forbidden toy in comparison to children in the no threat condition in a Tampa Bay setting (-5 = less preferable, 5 = more preferable), and how trustworthy a new study would be if FIU fails to replicate the results from the study they just read (1 = I'd find the new study questionable, 7 = I'd find the new study trustworthy). They were also asked about the original study they read and the outcome the researchers said occurred. They were then asked to pick between three answer choices: Threatened children found the forbidden toy more preferable than

non-threatened children; threatened children found the forbidden toy less preferable than non-threatened children; threatened children found the forbidden toy neither more nor less preferable than non-threatened children. Following questions asked about demographic information, which included gender, age, race/ethnicity, if English was their first language, and if they were an FIU student. The participants were then debriefed and were told the hypothesis.

Results

Using survey conditions (more vs. less vs. neutral) as our independent variable and whether participants remembered the results from the original study as our dependent variable, we ran a chi-square in which we saw a significant effect, $X^2(4) = 197.99, p < .001$. Most participants in the “more” category said children that were threatened would rank the toy more preferable than children who were not threatened (91.5%). Most participants in the “less” category said threatened children would rank the toy less preferable than non-threatened children (90%). Most participants in the “neutral” category said there was no difference between threatened and non-threatened children (83.3%). Results show that participants remembered what condition they were placed in.

We ran a One-Way ANOVA with condition as our independent variable (more vs. less vs. neutral) and preference ratings as our dependent variable. The ANOVA was significant, $F(2, 142) = 41.29, p < .001$. In order to test the differences between means, we ran a Tukey post hoc test. This showed that participants thought there would be greater toy preference in both the more ($M = 1.96, SD = 1.67$) and neutral conditions ($M = 0.77, SD = 1.90$) than in the less condition ($M = -1.46, SD = 2.05$).

We were also interested in the extent participants thought a replication failure would impact their rating of the real study. We ran a another One-Way ANOVA with condition as our

independent variable (more vs. less vs. neutral) and trustworthiness ratings as our dependent variable, which results showed was not significant, $F(2, 142) = 1.42, p > .05$. All our participants, from more ($M = 3.11, SD = 1.03$) to neutral ($M = 3.46, SD = 1.37$) to less ($M = 3.12, SD = 1.06$), thought that failing to replicate the original results would lead to similar levels of distrust of the new study.

Discussion Study One

We predicted that if belief perseverance is working, then failure to confirm the prior study would cause the participants to find the new study less trustworthy. Our results support this, with participants across all conditions failing to show a significant difference between their results. This means that that not being able to replicate the original results would create distrust for the new study. We also predicted that if belief perseverance was at work, then there would be a difference in preference ratings across the three condition groups. Our results supported this, showing a greater toy preference in the more and neutral conditions than in the less condition. With our hypothesis supported by our results, we ask if warning participants would impact their belief perseverance.

Study Two

With belief perseverance being shown to be at work in our study, we introduced forewarning as our second independent variable. The term “warning” refers to the prior announcement of information and topics (Dean, Austin, & Watts, 1971). In the context of communication, people tend to resist being persuaded by messages they think attack one of their beliefs (Infante, 1973; Neimeyer, Macnair, Metzler, & Courchaine, 1991). Infante (1973) continues to say that forewarning is used as a tactic to prepare against a belief attack. He also mentions the inoculation theory, which predicts that forewarning creates a threat which

essentially triggers the production of belief defenses, the tendency to resist persuasion or information that conflicts with their own beliefs.

Neutral worded warnings, which contain no mention of any desirable or undesirable consequences, are not perceived by the receiver as threatening; however, warnings with opinionated language, statements that express an attitude that's either positive or negative towards someone or something, cause the inoculation theory to be put to work since receivers are given motivation to resist persuasion (Infante, 1973). Many researchers suggest that warning merely magnifies the response the individual would've made without the warning (Dean, Austin, & Watts, 1971). This suggests that when an individual is forewarned that someone will promote a belief that is different from their own, the individual spends the time after rehearsing, recalling, and creating arguments to support their own point-of-view (Leon, Rotunda, Sutton, & Schlossman, 2003).

In a study mentioned by Leon, Rotunda, Sutton, and Schlossman (2003), participants were asked to monitor their thoughts in the time frame that came after the warning period. During the time frame, evidence of counter-arguments was found in the thoughts the participants listed. The study argued that, for the most part, thinking about counter-arguments is not an instantaneous process. Because participants were warned, researchers concluded that having a brief delay between warning and beginning of a message facilitates belief defense and the amount of persuasion that occurs as a result of communication decreases.

However, not all researchers agree that forewarning equates to less persuasion, and some experiments have found evidence that forewarning can change a participant's opinion. Leon, Rotunda, Sutton, and Schlossman (2003) brought up an experiment by Kiesler, which found that public commitment to beliefs influenced the effects of forewarning. According to results, the

greater the commitment, the greater the effort to resist persuasion. Based on this, we can also assume that the less publicly committed participants are to their beliefs, the more likely they are to be persuaded. Other variables, such as attractiveness of the communicator (the more attractive the communicator is, the more likely participants are to be influenced) and how respectable a person is (the more respectable a person seems, the more likely participants are to be influenced), are also believed to influence the effects of forewarning (Leon, Rotunda, Sutton, & Schlossman, 2003; McGuire, & Millman, 1965).

While several studies have looked at the relationship between persuasion and forewarning, not many have explicitly looked at the relationship between belief perseverance and forewarning. Studies previously discussed found that the more participants were committed to their beliefs, the less likely they were to be persuaded to change their beliefs. Since participants cling to their beliefs and oftentimes disregard evidence that might be contradictory, they exhibit belief perseverance. Because we added a new independent variable to our study, eliminated the neutral condition, and eliminated the Tampa, Florida replication question, we altered our predictions to fit our new variables.

We predict that belief perseverance will lead participants to believe the findings of prior discredited research will still apply to a future research study if participants are not warned about what belief perseverance is, but not if they are. That is, if told a prior study found a threatened child ranked a forbidden toy lower than a non-threatened child, our own participant will think that result will persist in a future study with a threatened child finding the toy less preferable compared to a non-threatened child. Alternatively, if told a prior study found a threatened child ranked a forbidden toy higher than a non-threatened child, our own participant will similarly think that result will persist in a future study with a threatened child finding the toy more

preferable compared to a non-threatened child. In short, we expect those in the no warning condition to replicate results from our first study. For participants in the warned condition, we expect the differences between the more and less conditions to decrease. That is, we expect lower levels of belief perseverance for participants who were warned than those who were not.

Methods

Participants

One hundred and forty subjects were recruited to participate in Study 2. These participants were different than the ones recruited for Study 1. Of these 140 participants, 66 were male (47.1%) and 74 were female (52.9%). The age of our sample ranged from 15 to 69 ($M = 24.03$, $SD = 8.42$). This included 22.1% Caucasian ($N = 31$), 62.9% Hispanic ($N = 88$), 8.6% African American ($N = 12$), 0.7% Asian ($N = 1$), and 5.7% of participants reporting “other” ($N = 8$).

Materials and Procedures

Participants were asked to complete an online study. If they agreed to participate, they were linked to the survey administered through Qualtrics. Before they were exposed to the research material, participants were told of the risks and benefits associated with the study. Once they gave their consent, they were able to access the material.

Similar to Study 1, participants were randomly placed into conditions. However, we eliminated the neutral condition in Study 2, so participants were either placed in the more or less condition. Participants in these conditions were asked to read the same short scenario presented to participants in Study 1 and were asked to answer some questions. These questions, which were included in Study 1, asked if the results surprised them (1 = not at all surprising, 7 = very

surprising) and if they thought the methodology used in the study was scientific (1 = not at all scientific, 7 = very scientific). Again, these questions were not the real focus of the study.

Qualtrics then randomly placed participants in either a “warning” or “no warning” condition. If they were placed in the warning condition, participants were told that the study they just read were fictitious, like in Study 1, and were also told that we are interested in belief perseverance. Belief perseverance was then defined to them as “the extent to which people continue to hold on to old beliefs, even when presented with new information.” Participants in the no warning condition were only told the results were fictitious. Warning simply refers to whether or not participants were told what belief perseverance is. Participants in both conditions were asked a series of questions. Like in Study 1, they were asked how they thought the children in the threat condition would rank the forbidden toy in comparison to the children in the no threat condition (-5 = less preferable, 5 = more preferable), how trustworthy a new study would be if FIU fails to replicate the results from the study they just read (1 = I’d find the new study questionable, 7 = I’d find the new study trustworthy). They were again asked if they could remember the results of the original study and were asked to choose one of the following: Threatened children found the forbidden toy more preferable than non-threatened children, threatened children found the forbidden toy less preferable than non-threatened children, threatened children found the forbidden toy neither more nor less preferable than non-threatened children.

Participants were then asked to correctly define what belief perseverance was from one of three choices: When people can't remember information that contradicts their beliefs, when people hold on to old beliefs, even when presented with new, contradictory information, when people refuse to make friends with people that don't agree with their beliefs. They were also

asked to what extent belief perseverance had an effect on their perceptions of the study to be conducted at FIU (1 = definitely had no effect, 7 = definitely had a large effect). They were then asked for demographic information, which included gender, age, ethnicity, if English was their first language, and what the highest level of education they have completed is. Participants were also asked to enter the name of the student who linked them to the survey. They were then debriefed and told the hypothesis.

Results

Using one of our conditions (warning vs. no warning) as our independent variable and whether participants remembered the definition of belief perseverance as our dependent variable, we ran a chi-square in which we saw a significant effect, $X^2(2) = 26.51, p < .001$. Most participants in the warning condition remembered the definition of belief perseverance (80%). Most participants in the no warning condition correctly picked the definition of belief perseverance (31.7%). Participants in the warning condition correctly remembered the definition of belief perseverance as we expected. Phi was 0.44, which is a moderate effect (*See Appendix A*).

Using our other condition (more vs. less) as our independent variable and whether participants remembered the results of the original study as our dependent variable, we ran a chi-square in which we saw a significant effect, $X^2(2) = 68.85, p < .001$. Most participants in the more condition remembered the condition in the study they read was more (89.9%). Most participants in the less condition remembered the condition in the study they read was less (84.6%). Phi was 0.70, which is a large effect. Participants remembered the results of the original study they read (*See Appendix B*).

We ran a univariate ANOVA using condition (more vs. less) and warning (warning vs. no warning) as our independent variables and participant's rating of children's toy preference as our dependent variable. We found a significant main effect of condition, $F(1,136) = 78.35, p < .001$. Participants in the more condition rated children's toy preference significantly higher ($M = 1.66, SD = 3.22$) than participants in the less condition ($M = -1.81, SD = 2.88$). We did not find a significant main effect of warning, $F(1,136) = 2.23, p = 0.14$. Participants in the warning condition rated children's preference of toys the same as ($M = -0.37, SD = 3.00$) participants in the no warning condition ($M = 0.21, SD = 3.94$). We looked at the interaction between our two independent variables (more vs. less and warning vs. no warning) and our dependent variable. We found a significant interaction, $F(1,136) = 100.34, p < .001$. When looking at simple effects, we found that participants in the more condition showed significantly greater toy preference in the no warning condition ($M = 3.91, SD = .70$) than in the warning condition ($M = -0.60, SD = 3.16$), $F(9,60) = 17.59, p < .001$. We also found that participants in the less condition showed significantly lower ratings of toy preference in the no warning condition ($M = -3.49, SD = 1.67$) than in the warning condition ($M = -0.14, SD = 2.86$), $F(10,59) = 7.56, p < .001$. According to simple effects, participants in the no warning condition showed significantly greater toy preference ratings in the more condition ($M = 3.91, SD = 0.70$), than the less condition ($M = -3.49, SD = 1.69$), $F(5,64) = 243.20, p < .001$. However, simple effects showed that participants in the warning condition did not differ in toy preference rating in the more ($M = -.60, SD = 3.16$) and less ($M = -0.14, SD = 2.86$) conditions, $F(10,59) = 1.51, p < .001$. For participants in the warning condition, there was not a difference in toy preference rating because they were aware we were looking at belief perseverance (*See Appendix C*).

We ran another factorial ANOVA using condition (more vs. less) and warning (warning vs. no warning) as our independent variables and participants' ratings of how effective belief perseverance was in impacting their responses as our dependent variable. Using Condition as our independent variable (more vs. less) and participants' belief perseverance ratings as our dependent variable, there was not a significant main effect of condition, $F(1,136) = 0.08$, $p = 0.77$. Participants in the more condition ($M = 4.07$, $SD = 2.03$) rated the effectiveness of belief perseverance the same as participants in the less condition ($M = 3.97$, $SD = 2.05$). Using warning as our independent variable (warning vs. no warning) and belief perseverance rating as our dependent variable, there was no significant main effect of warning, $F(1,136) = 0.90$, $p = 0.34$. There was no significant difference of responses provided by participants in the warning condition ($M = 3.86$, $SD = 2.16$) and participants in the no warning condition ($M = 4.19$, $SD = 1.90$). We looked at the interaction between our two independent variables (more vs. less and warning vs. no warning) and our dependent variable and found that there was not a significant interaction, $F(1,136) = 0.08$, $p = 0.77$ (See Appendix D).

Discussion Study Two

All of our hypotheses for Study 2 were supported by our results. We predicted that the differences between more and less conditions would decrease when warned. Our results support this, with participants in both conditions showing no significant differences. Being in the more or less conditions did not impact the participants because they were aware we were looking at belief perseverance. When looking at preference, we expected those in the no warning condition to replicate results from our first study and results showed that there was once again a difference between participants in the more and less conditions. We also predicted that when questioned about belief perseverance, there would be no difference amongst the participants. Results support

this, showing that it didn't matter what condition (more vs. less) the participant was in or whether or not they got a warning, participants said that they do not believe they are affected by belief perseverance.

General Discussion

Participants in both Study 1 and Study 2 were given a scenario that either said children that were threatened to have toys taken away found a toy more preferable than children who were not threatened, or children that were threatened to have toys taken away found a toy less preferable than children who were not threatened. We predicted that we would find a significant difference between the condition groups (more vs. less), and our results supported this. In Study 1, we found a greater toy preference in the more and neutral conditions than in the less condition. This result is supported by Mendel et al. (2011) with the example of the physician that ignored conflicting information that could suggest a different diagnosis. Like the physicians, our own participants did not seem to question the information that was given to them and believed the data that was presented to them. In Study 2, we predicted that participants in the not warned conditioned would show similar results to participants in Study 1. We eliminated the neutral condition in Study 2 and still found a difference between the more and less conditions when they were not warned.

We also tested if belief perseverance was present in Study 1 by asking participants to what extent they thought a replication failure would impact their rating of the real study. Participants across the more, less, and neutral conditions thought that failing to replicate the original results would lead to similar levels of distrust of a future study. Since participants believed the initial study they read, being told that a new study was unable to replicate the results would make them skeptical of how accurate the new study is. Like Biu's (2014) research, we

found that our participants showed belief perseverance by clinging to prior beliefs. Our research adds on to Biu's statement that belief perseverance is a cognitive schema, which are extremely difficult to alter. As Mendel et al. stated, belief perseverance allows people to disregard the possibility of being incorrect. When belief perseverance is present, people tend to not question previous knowledge and schemas.

Guenther and Alicke's (2008) research showed that, at times, belief perseverance can be so powerful that some researchers have to make participants aware of the impact it has on underlying assumptions. In order to do so, participants are often asked to think about and explain results of tests they are introduced to. We extended this research in Study 2 by introducing a warning component; participants that were warned were simply told what belief perseverance is. We predicted that when participants were warned, the differences between the more and less conditions would decrease, meaning that warning would decrease the influence of belief perseverance. Our results supported this, showing that participants in the more and less conditions did not have a significant difference between them. As mentioned, we expected and found that those in the no warning condition replicated results from Study 1. Because we found a significant difference between participants that were not warned in the more and less conditions, we can say that forewarning, like Leon, Rotunda, Sutton, and Schlossman (2003) suggested, can change a participant's opinion. According to them, the less publicly committed participants are to their beliefs, the more likely they are to be persuaded. Since our participants did not make their point of view on belief perseverance public until the end of the study, it is possible that our research extends theirs. Their research also states that having a brief delay between forewarning and the beginning of the study can facilitate belief defense and persuasion. If forewarning merely magnifies the response an individual would make without a warning (Dean, Austin, & Watts,

1971), then both our warning and no warning groups would've shown a significant difference between more and less conditions. But since only participants in the no warning group had a significant difference, our results contradict Dean, Austin, and Watt's (1971) research.

We also predicted that when we questioned participants across all conditions (more vs. less and warning vs. no warning) about belief perseverance and the extent to which they were influenced by it, there would not be a difference between their responses. Results supported this, showing that all participants believed they were not affected by belief perseverance.

Both studies contained a number of limitations, including a narrow sample. In both our studies, the participant pool consisted of mostly Hispanic undergraduate students from Florida International University. Future studies should contain a larger, more diverse sample size in order to be able to apply our results to the general public. In regards to our warning condition, future studies can also place the warning at the very beginning, before the participants were given the study materials. Future studies could also place the warning more discretely. Maybe if the definition of belief perseverance is not as explicitly stated, we can find more of a difference between the results of the participants in the warning condition. Participants in Study 2 might have been more at a disadvantage than participants in Study 1. Since the study was completed in person during Study 1, participants could have asked experimenters to clarify anything they didn't understand in the study. Since participants in Study 2 completed the study online, they were less likely to be able to ask experimenters to clarify any information presented to them. Future studies can present study materials in the same medium.

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Appendix A – Chi Square – Which of the following correctly defines belief perseverance?

Which of the following correctly defines belief perseverance? * Warning Crosstabulation

Count		Warning		Total
		Warning	No Warning	
Which of the following correctly defines belief perseverance?	When people can't remember information that contradicts with their beliefs	7	23	30
	When people hold on to old beliefs, even when presented with new, contradictory information	56	26	82
	When people refuse to make friends with people that don't agree with their beliefs	7	21	28
Total		70	70	140

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	26.509 ^a	2	.000
Likelihood Ratio	27.553	2	.000
Linear-by-Linear Association	.069	1	.794
N of Valid Cases	140		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 14.00.

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.435	.000
	Cramer's V	.435	.000
N of Valid Cases		140	

Appendix B – Chi Square – Which of the following correctly defines belief perseverance?

In the original study, what outcome did researchers say occurred? *
Condition Crosstabulation

Count

		Condition		Total
		More	Less	
In the original study, what outcome did researchers say occurred?	More	53	6	59
	Less	10	55	65
	Neutral	7	9	16
Total		70	70	140

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	68.845 ^a	2	.000
Likelihood Ratio	77.542	2	.000
Linear-by-Linear Association	38.578	1	.000
N of Valid Cases	140		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 8.00.

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.701	.000
	Cramer's V	.701	.000
N of Valid Cases		140	

Appendix C – Factorial ANOVA – Participant’s Rating of Children’s Toy Preference

Descriptive Statistics

Dependent Variable: Compared to children in the no-threat condition,

Condition	Warning	Mean	Std. Deviation	N
More	Warning	-.60	3.164	35
	No Warning	3.91	.702	35
	Total	1.66	3.216	70
Less	Warning	-.14	2.861	35
	No Warning	-3.49	1.687	35
	Total	-1.81	2.876	70
Total	Warning	-.37	3.003	70
	No Warning	.21	3.941	70
	Total	-.08	3.503	140

Tests of Between-Subjects Effects

Dependent Variable: Compared to children in the no-threat condition, how do you think children

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	973.964 ^a	3	324.655	60.304	.000
Intercept	.864	1	.864	.161	.689
Condition	421.779	1	421.779	78.345	.000
Warning	12.007	1	12.007	2.230	.138
Condition * Warning	540.179	1	540.179	100.338	.000
Error	732.171	136	5.384		
Total	1707.000	140			
Corrected Total	1706.136	139			

a. R Squared = .571 (Adjusted R Squared = .561)

Appendix D – Factorial ANOVA – Extent That Belief Perseverance Effected Reponses**Descriptive Statistics**

Dependent Variable: To what extent do you think belief perseverance

Condition	Warning	Mean	Std. Deviation	N
More	Warning	3.86	2.238	35
	No Warning	4.29	1.808	35
	Total	4.07	2.031	70
Less	Warning	3.86	2.116	35
	No Warning	4.09	2.005	35
	Total	3.97	2.050	70
Total	Warning	3.86	2.162	70
	No Warning	4.19	1.898	70
	Total	4.02	2.034	140

Tests of Between-Subjects Effects

Dependent Variable: To what extent do you think belief perseverance had an effect on your pe

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	4.479 ^a	3	1.493	.356	.785
Intercept	2264.064	1	2264.064	539.765	.000
Condition	.350	1	.350	.083	.773
Warning	3.779	1	3.779	.901	.344
Condition * Warning	.350	1	.350	.083	.773
Error	570.457	136	4.195		
Total	2839.000	140			
Corrected Total	574.936	139			

a. R Squared = .008 (Adjusted R Squared = -.014)