Yielding to Desire: The Durability of Affective Preferences

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People's expectations about the future are guided not just by the contingencies of situations but also by what they hope or wish will happen next. These preferences can inform predictions that run counter to what should or must occur based on the logic of unfolding events. Effects of this type have been regularly identified in studies of judgment and decision making, with individuals' choices often reflecting emotional rather than rational influences. Encouraging individuals to rely less on their emotional considerations has proven a challenge as affective responses are generated quickly and are seemingly informative for decisions. In 6 experiments we examined whether individuals could be encouraged to rely less on their affective preferences when making judgments about future events. Participants read stories in which contexts informed the likelihood of events in ways that might run counter to their preferential investments in particular outcomes. While being less than relevant given the logic of events, participants' affective considerations remained influential despite time allotted for predictive reflection. In contrast, instructional warnings helped attenuate the influence of affective considerations, even under conditions previously shown to encourage preferential biases. The findings are discussed with respect to factors that mediate preference effects, and highlight challenges for overcoming people's reliance on affective contributors to everyday judgments and comprehension.

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People rely on their subjective wishes and desires, emotional investments, and gut instincts when making decisions and evaluating possibilities, despite those influences often proving less reliable than the products of more rational, objective analyses (Alter, Oppenheimer, Epley, & Eyre, 2007; Kahneman, Slovic, & Tversky, 1982; Slovic, 1995; Slovic, Finucane, Peters, & MacGregor, 2002; Tversky & Kahneman, 1974, 1981). For example, the decisions people make with respect to the likelihood of future events are often informed by preferences that can run counter to what descriptions or objective facts dictate should logically occur (Allbritton & Gerrig, 1991; Gerrig, 1993). To date it has proven a challenge to motivate people to ignore these preferential investments. The current study tested the durability of preferences by examining whether they exert an influence after people's decisions are supported with guided warnings and time for contemplation, factors that represent critical considerations in contemporary models of decision making and comprehension.

As an example of how affective preferences might override the logic of unfolding events, consider a scene from the classic novel *The Count of Monte Cristo* (Dumas, 1846):

> At this moment, Dantes felt himself being thrown into a huge void, flying through the air like a wounded bird, then falling, falling, in a terrifying descent that froze his heart. Although he was drawn downward by some weight that sped his flight, it seemed to him that the fall lasted a century. Finally, with a terrifying noise, he plunged like an arrow into icy water, and he cried out, his cry instantly stifled by the water closing around him. Dantes had been thrown into the sea—and a thirty-six pound cannonball tied to his feet was dragging him to the bottom. (p. 201)

A variety of expectations might be developed about what could happen next in this scene (Graesser, Singer, & Trabasso, 1994; Zwaan & Radvansky, 1998). Based on the semantic content and logic of the story, and from objective knowledge of the real world, the most obvious prediction should be that Dantes will die. After all, no one would survive such an ordeal given the situation (e.g., the height of the fall, the weight around his feet). And yet people often generate alternative predictions informed not just by what *should* happen but also by what they *want* to happen.[1] Because Dantes is a likable character that readers come to root for, they may hope he will escape his plight. This can encourage expectations for how Dantes could break his bonds even though he logically should not be able to (e.g., perhaps he smuggled a lock-picking tool), as well as inferences that help overcome the situational contingencies (e.g., the cannonball was not tied carefully). This example illustrates how emotional biases for or against particular individuals or events, i.e., affective preferences, inform

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[1] Expectations can be informed not just by real world events and logical contexts but also by what people expect generally happens to individuals in certain types of situations. This includes beliefs about how heroes behave and that they usually win, and how bad guys behave and that they usually lose (Rapp & Gerrig, 2002). These contributors are also worthy of study, but for the current project we focused on desires and plot-driven expectations for how described events unfold, rather than on beliefs informed by schema- or genre-based knowledge.

the expectations that people generate, sometimes in contrast to the logic of unfolding descriptions and experiences.

Recent research has empirically demonstrated the consequences of these mutual influences. In two sets of experiments, Rapp and Gerrig (2002, 2006) asked participants to read short stories that described characters engaging in everyday activities. The unfolding events provided clear contextual support as to whether a character was likely to accomplish a particular task. For example, consider the following scenario:

> Alan was looking for money and coins on the beach. His metal detector began to click wildly in response to something buried in the sand. He shut off his detector and pulled out a hand shovel. He began to dig in a systematic fashion around the area.

Immediately after reading, participants were presented with an outcome sentence and asked to decide, within a 3-s deadline, whether that outcome was likely to occur given what they had read. Participants were more likely to accept outcomes consistent with what prior contexts suggested should happen compared to outcomes inconsistent with those contexts. Using the example, participants agreed with "After some digging, Alan found a nice pile of coins" more than "Alan gave up digging, he was not able to find anything," likely because the detector's clicking suggested Alan would find coins.

But follow-up experiments also showed that participants' decisions were influenced by what they *wanted* to happen. The scenarios were modified to include statements encouraging participants to root for or against the success of characters' endeavors. From the example, participants might learn that "Alan often used the money he found with his metal detector to purchase child pornography." The inclusion of this information increased the likelihood that participants would agree with the outcome "Alan gave up digging, he was not able to find anything" even after learning that the detector "began to click wildly." Similarly, informing participants that "Alan always donated the money he found with his metal detector to child cancer research" increased the likelihood they would agree with "After some digging, Alan found a nice pile of coins" even after learning "his metal detector was silent." These agreement patterns demonstrate that preferences for successes and failures influenced judgments about future events, sometimes in ways that ran counter to what the scenario necessitated would happen. While the influence of preferences was never of a similar magnitude to the influence of prior contexts, affective investments and subjective desires for story events often led to surprising decisions inconsistent with more rational analyses of the descriptive contents.

Why do preferences exert this influence? Researchers have argued that affective responses arise quickly and efficiently, consciously and unconsciously, outside of and preceding cognitive analyses (Epstein, 1994; Loewenstein & Lerner, 2003; Schwarz & Clore, 1988; Shiv & Fedorikhin, 1999; Slovic et al., 2002; Zajonc, 1980). These affective responses are generated through automatic reactions to stimuli, informed by previous experiences and instinctual feelings. In contrast, cognitive responses involve higher order activity that includes evaluative and deliberative processing. This distinction between affective and cognitive responses is akin to that associated with heuristic and algorithmic processing (Kahneman & Tversky, 1982; Newell & Simon, 1972); in fact, some

researchers have identified an "affect heuristic" that involves relying on emotional responses to stimuli and similar previous experiences as cues for making judgments (Slovic et al., 2002). Such reliance is of utility as it would allow feelings of, for instance, safety or danger, or positive and negative intuitions, to rapidly influence decisions, rather than requiring labored evaluation as associated with algorithmic processing. Like other heuristics, though, such a processing short-cut, while informative, can lead to problematic decisions (e.g., predicting outcomes unlikely to occur despite our wanting them to happen).

As one demonstration of this affective influence, Sherman and Kim (2002) asked English-speaking participants to study Chinese characters and their meanings, with half of the characters associated with positive definitions (e.g., beautiful), and the other half with negative definitions (e.g., disease). Poststudy tests revealed that participants tended to prefer characters with positive definitions more than characters with negative definitions, even though the visual iconography of the characters did not in any way embody or depict the meanings. The previously studied characters were then paired with new, neutral meanings (e.g., desk), with participants informed these were the actual definitions. After studying the new meanings to criterion, participants still preferred characters previously associated with positive rather than negative definitions, even though the earlier learned definitions no longer applied.

These findings indicate that affective preferences can influence subsequent judgments, even when those preferences are no longer relevant and have been explicitly discounted. One explanation as to why preferences guide decisions is that individuals' emotional investments and subjective desires emerge quickly, with those early responses being privileged and difficult to overcome even in the face of relevant and logical counterevidence. Reducing such reliance is important given the possibility that affective responses can lead to faulty, underinformed decisions. Thus far two methods have received preliminary endorsement, albeit little experimental investigation. First, given appropriate motivation and opportunities for contemplation, individuals may be less likely to make decisions that conform to their affective preferences (e.g., Maule, Hockey, & Bdzola, 2000; Svenson & Benson, 1993). Accounts of emotional processing have hypothesized that decisions are initially informed by rapid affective responses to stimuli that only subsequently invoke assessment (Schachter & Singer, 1962). Providing participants with time to evaluate information might reduce the influence of affect or encourage algorithmic reasoning. Initial emotional activations might be discounted in favor of more slowly enacted responses that can be strategically prepared and considered.

A second method derives from claims that when people can identify the source of their emotional state, they are less likely to make misinformed decisions based on affect (Schachter & Singer, 1962). The influence of preferences might analogously be reduced if people are made aware of a propensity to fall victim to affectively driven responses and warned against doing so. Informing participants that emotions can be manipulated to bias judgments would, on this view, foster resolve against any such manipulations and reduce the likelihood of making decisions based on preferences. This could include instructing participants to discount particular cues as a useful source of information. Encouraging scrutiny can generally enhance readers' evaluations of content (Rapp

& Mensink, 2011; Sparks & Rapp, 2011), but these benefits have not been tested against the robust influence of preferences.

The current study investigated the durability of preferences by testing their resistance to intervention by the above factors. In six experiments we examined whether participants' judgments about future events are necessarily guided toward decisions that rely on preferences.

Experiment 1

The findings from Rapp and Gerrig (2006) demonstrated that decisions about future events are informed, while under time pressure, by both situational contexts and preferences. Participants were only allowed 3 s to make their decisions, which might have encouraged reliance on the quick, emotional responses encoded as preferences. We began by removing this pressure under the assumption that the lack of a response deadline might afford the opportunity to more rationally contemplate the contingencies offered in the scenarios. Overall we expected, in line with previous work, that participants would agree more with outcomes consistent rather than inconsistent with story contexts. The crucial question was whether participants' decisions would also indicate agreement with outcomes that were consistent with rather than inconsistent with their affective preferences. If the lack of time pressure led to a greater influence of contexts or a decreased influence of preferences, we expected the standard interaction between preferences and outcomes to be attenuated or eliminated.

Method

Participants. Fifty-six Northwestern University undergraduates participated for class credit or $10 monetary compensation. All participants were native English speakers.

Apparatus. Four computers running Superlab 3.0 software recorded responses. Participants sat in front of one of the computers with their hands resting on the keyboard. They pressed buttons on the keyboard to make appropriate responses, using clearly labeled "NEXT," "YES," and "NO" keys. Sentences were displayed in the center of the screen, one at a time.

Materials. Twenty-four experimental stories from Rapp and Gerrig (2006) were used. Each six-sentence story described everyday situations (see Figure 1 for examples). The first sentence of each story introduced the main character and included a statement intended to instantiate preferences. Success preference statements were designed to encourage a preference for the main character to succeed (e.g., "Holly had come quite far since that fateful day she'd been severely injured by a drunk driver."), while failure preference statements were designed to encourage a preference that the main character would fail (e.g., "Holly relied on illegal steroids to prepare for the race, having acquired them from a drug dealer."). The statements written for each pair were equated for length. The second sentence continued the story in a general way. The third sentence provided a biasing context that made it more or less likely main characters would complete their activity. Specifically, success-biasing contexts indicated the character would likely succeed at a goal (e.g., "When the finish line came into view, her nearest competitor was still several yards behind her."), while failure-biasing contexts indicated the character would likely fail (e.g., "When the finish line came into view, she was several

yards back of the lead runner."), with sentences equated for length. The fourth and fifth sentences continued the story. The sixth, final sentence provided an outcome that described the main character succeeding at his or her task (e.g., "Moments later, Holly was the winner of the Tri-State marathon.") or failing at that task (e.g., "Moments later, Holly had failed to win the Tri-State marathon."), equated for length. The preference and biasing context sentences were previously normed to ensure they had their intended affective and biasing impacts (Rapp & Gerrig, 2006). Twenty-four filler stories were also used, each six sentences long but without preference- or context-biasing contents.

Design. There were eight versions of each of the 24 experimental stories as a function of preference statement (success vs. failure), biasing context (success vs. failure), and outcome sentence (success vs. failure). Using a Latin-square we constructed eight lists with one version of each story appearing in a different version on each list. The 24 filler stories were added to each list. Thus, each participant read one version of each experimental story and all filler stories for a total of 48 stories. Each participant read the stories in a different random order.

Procedure. Participants began by reading through the experimental instructions and completing three practice stories to become acquainted with the task and keyboard layout. Then participants began the experiment proper. Participants advanced through a story by pressing the NEXT key (the "A" key). When the last sentence of a story was presented, a ping sounded, and the participant was asked to make a YES/NO decision as to whether the outcome offered a likely conclusion to the story. Participants indicated YES (i.e., "I agree [that this would happen next]"; the "J" key) or NO (i.e., "I do not agree [that this would happen next]"; the "K" key) by pressing the appropriate key on the keyboard. Participants responded at their own pace and speed was not emphasized. After making their decision, the next story began.

Results and Discussion

Table 1 presents the results from Experiment 1. We eliminated decision times falling more than three standard deviations above the mean resulting in a loss of 1.04% of the data. On average participants took 2,119 ms ($SD = 951$ ms) to make their decisions. All analyses were carried out with participants (F_1) and items (F_2) as random variables. We analyzed the data including the stimuli list a participant received as a between-participants factor, which did not change the overall pattern of reported effects; thus, for ease of presentation, all reported analyses collapsed across the eight counterbalanced stimuli lists.

In line with previous work, we obtained a significant interaction of biasing contexts and outcome sentences: On average, participants were 54.2 percentage points more likely to say "yes" to outcome sentences consistent with preceding story contexts (i.e., stories with success-biasing contexts and successful outcomes, or failure-biasing contexts and failure outcomes) compared to outcomes inconsistent with preceding contexts (i.e., stories with success-biasing contexts and failure outcomes, or failure-biasing contexts and success outcomes), $F_1(1, 55) = 359.46$, $MSE = 0.35$, $p < .001$, $\eta_p^2 = .87$; $F_2(1, 23) = 283.66$, $MSE = 0.26$, $p < .001$, $\eta_p^2 = .93$. Simple effects tests showed this pattern emerged both for stories with success-biasing contexts (a 62.9% difference)—$F_1(1, 55) = 288.89$, $MSE = 0.15$, $p < .001$, $\eta_p^2 = .84$; $F_2(1, 23) = $

Story

Success preference statement: Holly had come quite far since that fateful day she'd been severely injured by a drunk

driver.

Failure preference statement: Holly relied on illegal steroids to prepare for the race, having acquired them from a

drug dealer.

Holly had never won the Tri-State marathon before.

Success-biasing context: When the finish line came into view, her nearest competitor was still several yards behind

her.

Failure-biasing context: When the finish line came into view, she was several yards back of the lead runner.

She grabbed a drink from the outstretched hand of an onlooker.

She noticed a piece of tape had been strung across the finish line.

Story Outcomes

Successful outcome: Moments later, Holly was the winner of the Tri-State marathon.

Failure outcome: Moments later, Holly had failed to win the Tri-State marathon.

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Story

Success preference statement: Stu had to get to the hospital in order to help his pregnant wife through her delivery.

Failure preference statement: Stu had too much to drink at the bar, and wasn't aware that he was quite drunk.

Stu needed the car to start up as soon as he turned the key.

Success-biasing context: He was glad he'd gotten a tune-up and had his spark plugs replaced.

Failure-biasing context: Unfortunately, the old car needed a tune-up, and the spark plugs needed replacing.

He hopped into the car and placed his keys in the ignition.

Stu closed his eyes and gave it a try.

Story Outcomes

Successful outcome: The car started immediately and Stu was set.

Failure outcome: The car absolutely refused to start for Stu.

Figure 1. Sample story, outcome sentences, and comprehension questions.

198.49, $MSE = 0.13$, $p < .001$, $\eta_p^2 = .90$—and failure-biasing contexts (a 45.5% difference)—$F_1(1, 55) = 154.68$, $MSE = 0.15$, $p < .001$, $\eta_p^2 = .74$; $F_2(1, 23) = 96.61$, $MSE = 0.13$, $p < .001$, $\eta_p^2 = .81$.

We next tested whether allowing unlimited time to respond would modify the influence of preferences on outcome decisions. The relevant interaction between preference statements and story outcomes, as obtained in previous work, was again significant: Participants were, on average, 8.1 percentage points more likely to say "yes" to outcome sentences consistent with preceding preference statements (i.e., stories with success preference statements and successful outcomes, or failure preference statements and failure outcomes) compared to outcomes inconsistent with those

preferences (i.e., stories with success preference statements and failure outcomes, or failure preference statements and success outcomes), $F_1(1, 55) = 9.56$, $MSE = 0.28$, $p = .003$, $\eta_p^2 = .15$; $F_2(1, 23) = 11.34$, $MSE = 0.15$, $p = .003$, $\eta_p^2 = .33$). Simple effects tests showed this pattern obtained for stories that included success preference statements (a 16.7% difference; $F_1(1, 55) = 23.94$, $MSE = 0.12$, $p < .001$, $\eta_p^2 = .30$; $F_2(1, 23) = 19.83$, $MSE = 0.09$, $p < .001$, $\eta_p^2 = .46$) but not for stories with failure preference statements (a 1% difference; $F_1(1, 55) = .05$, $MSE = 0.13$, $p = .822$, $\eta_p^2 < .01$; $F_2(1, 23) = .02$, $MSE = 0.11$, $p = .883$, $\eta_p^2 < .01$). We note that the 8.1 percentage point difference described here was smaller than the 19 percentage point difference obtained in Rapp and Gerrig (2006), presumably due to the addi-

Table 1

Agreement Rates (Percentage "Yes" Responses) and Standard Deviations (in Parentheses) in Experiment 1

Context	Successful outcome	Failed outcome	Mean
Success preference			
Success-biasing context	90.5 (19.8)	17.8 (25.4)	54.2
Failure-biasing context	34.2 (30.2)	73.5 (29.1)	53.9
Mean	62.4	45.7	
Failure preference			
Success-biasing context	83.0 (21.5)	30.0 (26.8)	56.5
Failure-biasing context	25.0 (26.4)	76.8 (22.8)	50.9
Mean	54	53.4	

tional time allowed for the decision. But that additional time appeared to attenuate rather than eliminate preferential effects.

Finally, participants overall tended to agree more with success outcomes ($M = 58.2\%$) than failure outcomes ($M = 49.5\%$), $F_1(1, 55) = 13.90$, $MSE = 0.23$, $p < .001$, $\eta_p^2 = .20$; $F_2(1, 23) = 7.63$, $MSE = 0.26$, $p = .011$, $\eta_p^2 = .25$. No other effects were significant (all $Fs < 2.5$).

Experiment 1 replicated previous findings as participants' predictions about future events were influenced both by story contexts and their preferences. As in previous work, the influence of preferences was not of the same magnitude as the influence of contexts, although both contributed to participants' decisions. Notably, the preferential influence was reduced when considered with respect to projects requiring judgments under time pressure. But the fact that the preferential bias nevertheless emerged indicates the resiliency of affect-driven influences.

Experiment 2

Emotional responses exert early effects on judgments and decisions, with logical reasoning processes emerging with the passage of time (Schachter & Singer, 1962). Pressure conditions that limit the amount of time to evaluate a problem can lead to affectively biased judgments (Finucane, Alhakami, Slovic, & Johnson, 2000), offering a potential explanation as to why previous projects have reported effects larger than those observed in Experiment 1 (which included no time pressure). Providing participants with an additional, explicit opportunity to contemplate the scenarios before prompting for judgments might further overcome preferential influences precisely by allowing for the application of more careful reasoning. Based on this hypothesis, Experiment 2 included a 3-s pause immediately before each judgment, to evaluate whether extra time would foster reliance on analytic reasoning more so than affective responses. If the delay was successful, we expected participants would agree with outcomes consistent with prior contexts but not potential preferences. However, if preferences influence decisions despite the opportunity for contemplation, we expected to obtain results analogous to Experiment 1.

Method

Participants. Fifty-six Northwestern University undergraduates, none of whom completed Experiment 1, participated for class credit. All were native English speakers.

Apparatus. The apparatus for this and all subsequent experiments was identical to Experiment 1.

Materials and design. The materials and design for this and all subsequent experiments were identical to Experiment 1.

Procedure. The procedure was identical to Experiment 1 with the following change. A 3-s delay was provided after the fifth sentence of each story, preceding the outcome sentence. During the delay, four asterisks replaced the previous sentence on the screen. After 3 s, a ping sounded, the outcome sentence appeared, and participants made their judgment of the outcome sentence. They were never told the purpose of the delay.

Results and Discussion

Table 2 presents the results from Experiment 2. We eliminated decision times falling more than three standard deviations above the mean, resulting in a loss of 1.04% of the data. On average, participants took 2,219 ms ($SD = 1,118$ ms) to make their decisions.

As in Experiment 1, a significant interaction of story context and outcome obtained: Participants were, on average, 50.2 percentage points more likely to say "yes" to outcome sentences consistent with preceding story contexts compared to outcomes inconsistent with contexts, $F_1(1, 55) = 261.31$, $MSE = 0.41$, $p < .001$, $\eta_p^2 = .83$; $F_2(1, 23) = 161.94$, $MSE = 0.38$, $p < .001$, $\eta_p^2 = .88$. Simple effects tests showed this pattern obtained both for stories with success-biasing (a 62.7% difference)—$F_1(1, 55) = 281.06$, $MSE = 0.15$, $p < .001$, $\eta_p^2 = .84$; $F_2(1, 23) = 214.16$, $MSE = 0.11$, $p < .001$, $\eta_p^2 = .90$—and failure-biasing contexts (a 37.6% difference)—$F_1(1, 55) = 94.09$, $MSE = 0.16$, $p < .001$, $\eta_p^2 = .63$; $F_2(1, 23) = 28.02$, $MSE = 0.31$, $p < .001$, $\eta_p^2 = .55$.

The crucial question was whether the inclusion of a delay prior to the decision point would influence preferential effects. The results suggested the delay was ineffective as the interaction between preferences and outcomes again obtained: On average, participants were 9.7 percentage points more likely to say "yes" to outcome sentences consistent with preceding preference statements compared to outcomes inconsistent with preferences, $F_1(1, 55) = 18.91$, $MSE = 0.26$, $p < .001$, $\eta_p^2 = .26$; $F_2(1, 23) = 12.51$, $MSE = 0.19$, $p = .002$, $\eta_p^2 = .35$. This influence was similar to that observed in Experiment 1. Simple effects tests showed this pattern obtained for stories with success preference statements (a 22.3% difference)—$F_1(1, 55) = 39.87$, $MSE = 0.14$, $p < .001$, $\eta_p^2 = .42$;

Table 2

Agreement Rates (Percentage "Yes" Responses) and Standard Deviations (in Parentheses) in Experiment 2

Context	Successful outcome	Failed outcome	Mean
Success preference			
Success-biasing context	87.4 (18.6)	14.3 (20.9)	50.9
Failure-biasing context	40.4 (30.3)	69.0 (29.0)	54.7
Mean	63.9	41.7	
Failure preference			
Success-biasing context	81.2 (25.5)	28.8 (27.4)	55.0
Failure-biasing context	29.4 (24.8)	75.9 (24.6)	52.7
Mean	55.3	52.4	

$F_2(1, 23) = 21.23$, $MSE = 0.15$, $p < .001$, $\eta_p^2 = .48$—but not for stories with failure preference statements (a 3.0% difference in the opposite direction)—$F_1(1, 55) = .12$, $MSE = 0.10$, $p = .729$, $\eta_p^2 < .01$; $F_2(1, 23) = .31$, $MSE = 0.18$, $p = .582$, $\eta_p^2 = .01$.

Participants overall tended to agree more with success outcomes ($M = 59.6\%$) than failure outcomes ($M = 47\%$), $F_1(1, 55) = 28.62$, $MSE = 0.21$, $p < .001$, $\eta_p^2 = .34$; $F_2(1, 23) = 8.83$, $MSE = 0.46$, $p = .007$, $\eta_p^2 = .28$. We also observed an interaction between preference and biasing contexts, marginal by participants only, $F_1(1, 55) = 2.89$, $MSE = 0.19$, $p = .095$, $\eta_p^2 = .05$; $F_2(1, 23) = 1.93$, $MSE = 0.13$, $p = .178$, $\eta_p^2 = .08$. No other effects were significant (all Fs < 2.5).

The results of Experiment 2 indicated little effect of a delay allowing for additional contemplation. Participants' judgments remained influenced by preceding story contexts and statements encouraging preferences to root for or against the success of story characters. In fact, the preferential bias was similar to that obtained in Experiment 1 (9.7 vs. 8.1 percentage points). One reason why the additional time may have failed to prompt more evaluative processing or to decrease reliance on affective responses is that participants might not have actually engaged in careful analyses of the scenarios during the delay. Recall that participants were not instructed to use the delays to engage in story evaluation. Recent work has demonstrated instructions can invoke evaluative processing that reduces the influence of misinformation (Peshkam, Mensink, Putnam, & Rapp, 2011; Rapp, Hinze, Kohlhepp, & Ryskin, 2014; Sparks & Rapp, 2011). We next tested whether instructional guidance might decrease the influence of affective preferences.

Experiment 3

Previous work has suggested that heuristic judgments are less likely to emerge when participants know about the sources that potentially inform decisions (Schachter & Singer, 1962), are made accountable for their decisions (Tetlock & Lerner, 1999), and are focused on their cognitions compared to their feelings (Ratner & Herbst, 2005). In line with these suggestions, in Experiment 3 we explicitly instructed participants to make decisions based on the logic of story contexts rather than on emotional responses to characters and events. We hypothesized that if such instructions reduce reliance on preferences or encourage greater attention to story contexts, the interaction between preferences and outcomes should no longer obtain. However, if preferences influence judgments despite the instructions, we expected participants' decisions would reflect the influence of both contexts and preferences.

Method

Participants. Fifty-six Northwestern University undergraduates participated for class credit. All were native English speakers, and none took part in Experiments 1 or 2.

Procedure. The procedure was identical to Experiment 1 with the following change. A paragraph was added to the instructions warning participants not to fall victim to the ways in which authors manipulate and bias readers' emotions. The instructions read as follows:

> Writers often use emotional content to influence how readers think about stories. For example, they might put a sympathetic character in

Table 3

Agreement Rates (Percentage "Yes" Responses) and Standard Deviations (in Parentheses) in Experiment 3

Context	Successful outcome	Failed outcome	Mean
Success preference			
Success-biasing context	89.3 (20.2)	14.0 (21.2)	51.7
Failure-biasing context	23.2 (28.4)	78.2 (23.6)	50.7
Mean	56.3	46.1	
Failure preference			
Success-biasing context	76.8 (28.9)	24.1 (27.7)	50.5
Failure-biasing context	15.5 (23.7)	84.5 (25.4)	50
Mean	46.2	54.3	

an impossible situation, making you want the character to succeed; however, realistically the character would probably fail. While you are reading each story today, you will be asked to decide whether you think the final sentence of the story accurately describes what would happen next. When making this decision, we would like you to base your choice on what you realistically think would happen next, not on what your emotions tell you should happen next.

Results and Discussion

Table 3 presents the results from Experiment 3. We eliminated decision times falling more than three standard deviations above the mean, resulting in a loss of 1.26% of the data. On average, participants took 2,475 ms ($SD = 1,432$ ms) to make their decisions.

A significant interaction of story contexts and outcomes obtained: Participants were, on average, 63.0 percentage points more likely to say "yes" to outcome sentences consistent with preceding story contexts compared to outcomes inconsistent with those contexts, $F_1(1, 55) = 505.87$, $MSE = 0.34$, $p < .001$, $\eta_p^2 = .90$; $F_2(1, 23) = 572.05$, $MSE = 0.17$, $p < .001$, $\eta_p^2 = .96$.[2] Simple effects tests showed that this pattern obtained both for stories with success-biasing contexts (a 64.0% difference)—$F_1(1, 55) = 212.93$, $MSE = 0.21$, $p < .001$, $\eta_p^2 = .80$; $F_2(1, 23) = 163.50$, $MSE = 0.16$, $p < .001$, $\eta_p^2 = .88$—and failure-biasing contexts (a 62.0% difference), $F_1(1, 55) = 225.39$, $MSE = 0.18$, $p < .001$, $\eta_p^2 = .80$; $F_2(1, 23) = 220.30$, $MSE = 0.11$, $p < .001$, $\eta_p^2 = .91$.

Additionally, the instructions did not reduce the previously obtained influence of preferences, as the interaction between preferences and outcomes was again significant. Participants were, on average, 9.2 percentage points more likely to say "yes" to outcome sentences that were consistent compared to inconsistent with preceding preference statements, $F_1(1, 55) = 16.44$, $MSE = 0.21$, $p < .001$, $\eta_p^2 = .23$; $F_2(1, 23) = 14.69$, $MSE = 0.15$, $p = .001$, $\eta_p^2 = .39$. The magnitude of this influence was identical to that observed in Experiments 1 and 2. Simple effects tests showed this pattern obtained for stories with success preference statements (a 10.2%

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[2] We note that the 63.0 percentage point difference obtained here was numerically larger than the 52.5 percentage point difference obtained in Experiment 1. This might reflect participants' sensitivity to the story contexts as a function of the instructional manipulation in Experiment 3. The findings reported in the subsequent experiments are consistent with this possibility.

difference)—$F_1(1, 55) = 7.30$, $MSE = 0.15$, $p = .009$, $\eta_p^2 = .12$; $F_2(1, 23) = 7.38$, $MSE = 0.10$, $p = .012$, $\eta_p^2 = .24$—more so than for stories with failure preference statements (an 8.2% difference, marginal by participants only), $F_1(1, 55) = 3.75$, $MSE = 0.18$, $p = .058$, $\eta_p^2 = .06$; $F_2(1, 23) = 2.64$, $MSE = 0.16$, $p = .118$, $\eta_p^2 = .10$. No other effects were significant (all Fs < 2.5).

Instructions warning participants to discount affective responses that might emerge were insufficient to offset the previously obtained influence of preferences. The findings thus far indicate preferences are quite resilient (although less impactful than under conditions involving time pressure). That said, the manipulations tested thus far were relatively modest, involving a short introduction prior to beginning the experiment or a brief delay preceding each judgment. Beyond purely quantitative considerations as to their effectiveness, in combination these manipulations might exhibit qualitatively different effects. For example, instructions might prove more effective if participants have time to apply directed warnings to their decisions. Similarly, delays might be more effective if participants use them to carefully consider text content given the warnings. We next combined the two manipulations as an even more rigorous test of the durability of preferences.

Experiment 4

Participants received an explicit, instructional warning to avoid the influence of emotional responses and were given a short delay prior to making each outcome judgment. If the combination of these manipulations dissuades reliance on preferences, we expected participants to agree with outcomes consistent with contexts but not preference statements.

Method

Participants. Fifty-six Northwestern University undergraduates, none of whom completed Experiments 1, 2, or 3, participated for class credit. All were native English speakers.

Procedure. Experiment 4 combined the procedures from Experiments 2 and 3. The instructions warned participants to avoid falling victim to authors' emotional manipulations of their preferences; a 3-s delay was included between the fifth and final outcome sentences.

Results and Discussion

Table 4 presents the results of Experiment 4. We eliminated decision times falling more than three standard deviations above the mean, which resulted in a loss of 1.34% of the data. On average, participants took 2,235 ms ($SD = 1,279$ ms) to make their decisions.

As in the previous experiments, a significant interaction of story contexts and outcomes was observed: Participants were 60.8 percentage points more likely to say "yes" to outcome sentences consistent with preceding story contexts compared to outcomes inconsistent with those contexts, $F_1(1, 55) = 584.13$, $MSE = 0.27$, $p < .001$, $\eta_p^2 = .91$; $F_2(1, 23) = 682.84$, $MSE = 0.14$, $p < .001$, $\eta_p^2 = .97$. Simple effects tests showed this obtained for stories with success-biasing contexts (a 65.3% difference)—$F_1(1, 55) = 488.59$, $MSE = 0.09$, $p < .001$, $\eta_p^2 = .90$; $F_2(1, 23) = 196.79$,

Table 4

Agreement Rates (Percentage "Yes" Responses) and Standard Deviations (in Parentheses) in Experiment 4

Context	Successful outcome	Failed outcome	Mean
	Success preference		
Success-biasing context	84.5 (20.8)	16.1 (22.0)	50.3
Failure-biasing context	19.9 (24.7)	74.4 (23.8)	47.2
Mean	52.2	45.3	
	Failure preference		
Success-biasing context	80.3 (23.4)	18.1 (23.2)	49.2
Failure-biasing context	24.7 (26.8)	82.7 (22.0)	53.7
Mean	52.5	50.4	

$MSE = 0.14$, $p < .001$, $\eta_p^2 = .90$—and failure-biasing contexts (a 56.3% difference), $F_1(1, 55) = 230.69$, $MSE = 0.15$, $p < .001$, $\eta_p^2 = .81$; $F_2(1, 23) = 209.18$, $MSE = 0.10$, $p < .001$, $\eta_p^2 = .90$.

We next examined whether the coupling of a warning about affective responses and a delay prior to judgment would influence participants' preferential biases. In contrast to the three previous experiments, the interaction was attenuated, $F_1(1, 55) = .90$, $MSE = 0.29$, $p = .348$, $\eta_p^2 = .02$; $F_2(1, 23) = .22$, $MSE = 0.25$, $p = .647$, $\eta_p^2 = .01$. Simple effects tests showed a preferential influence failed to emerge both for stories with success preference statements (a 7% difference)—$F_1(1, 55) = 3.68$, $p = .06$, $\eta_p^2 = .06$; $F_2(1, 23) = 1.21$, $MSE = 0.14$, $p = .283$, $\eta_p^2 = .05$—and for stories with failure preference statements (a 2.1% difference in the opposite direction), $F_1(1, 55) = .38$, $MSE = 0.11$, $p = .538$, $\eta_p^2 = .01$; $F_2(1, 23) = .22$, $MSE = 0.15$, $p = .642$, $\eta_p^2 = .01$.

Participants also agreed more with success ($M = 52.4\%$) than failure outcomes ($M = 47.8\%$), marginal by participants only, $F_1(1, 55) = 3.99$, $MSE = 0.21$, $p = .051$, $\eta_p^2 = .07$; $F_2(1, 23) = 1.07$, $MSE = 0.33$, $p = .311$, $\eta_p^2 = .05$. No other effects were significant (all Fs < 2.4).

The critical interaction observed in the first three experiments was attenuated in Experiment 4. The combination of explicit instructions to ignore their emotional responses and a delay prior to each judgment proved effective in helping participants overcome the influence of preferences on their decisions. Participants now based their decisions on the information provided in the story contexts. The delay presumably served as a useful reminder for readers to contemplate the instructions, enhancing the effectiveness of the warnings.

Experiment 5

Recall that the results of Experiment 3 indicated that instructions on their own were insufficient to eliminate a preferential influence. This may have been due to the rather modest nature of the instructions, which merely highlighted the problem without offering examples or practice to support future evaluations. Given those instructions were nevertheless effective when participants were allowed time to contemplate future events, a more intensive set of instructional activities might encourage analogous contemplations during reading even without additional time. In Experiment 5 we tested this hypothesis by substantially modifying the instructions. First, the instructions were revised to explicitly illus-

trate the kinds of affective manipulations an author might use to engender preferential reactions. Explicit examples can support problem solving by reducing cognitive load and providing models for future behavior (Gersten & Douglas, 1986; Sweller, 2010). Second, one-on-one, directed practice required participants to provide reasoned explanations for their judgments. Generating explanations, which individuals do not always spontaneously do, can support decision making and text comprehension (Dunlosky, Rawson, Marsh, Nathan, & Willingham, 2013; McNamara, 2004). We examined whether these enhanced instructions would prove beneficial at reducing the influence of preferences.

Method

Participants.   Fifty-six Northwestern University undergraduates, none of whom completed any of the previous experiments, participated for $12 monetary compensation. All were native English speakers.

Procedure.   The procedure was identical to Experiment 3 with the following changes. An additional page of instructions was added to provide an example highlighting the kinds of information the participant should attend to during the experiment. The instructions read as follows:

> Please read the following story. The bolded words may elicit an emotional reaction that will affect what you want to happen to the character. The italicized words, however, reveal information that may be predictive of what would realistically happen to the character.
>
> Audrey needed to sneak out of her house past her curfew **to drive a drunken friend home from a party**. She hoped nobody was awake. *She heard someone laughing at the television in the living room*. She walked silently down the hall. Now she just needed to get through the living room to the back door.
>
> Now consider this ending to the story: Audrey made it out of the house undetected. Do you think this would realistically happen next?

An experimenter discussed the story outcome with each participant. During this discussion, the experimenter mentioned that although Audrey was doing a kindness for her friend, possibly encouraging readers to root for her to succeed at sneaking out of the house, there was someone awake in the living room, making it unlikely she would pass through easily.

The practice stories were edited to follow the structure of the experimental stories. Before participants made their judgments at the end of each practice story, they were required to explain their reasoning to the experimenter. During this explanation, if participants invoked their wishes for how the story would play out, the experimenter explained that they should focus on information that could more realistically predict the outcome. When participants could not offer a reason for their judgment, the experimenter modeled explanations based on the contextual information from the story. Over the course of these interactions, the experimenter indicated that although there were no right or wrong answers, participants should do their best to make judgments based on logical, predictive information. Following practice, participants saw an additional instruction screen explaining that for the remainder of the study they would no longer be discussing their judgments with the experimenter but that they should continue to monitor the stories for information that could help judge whether

outcomes would realistically take place. The procedure then continued as in Experiment 2.

Results and Discussion

Table 5 presents agreement rates from Experiment 5. We eliminated decision times falling more than three standard deviations above the mean, resulting in a loss of 1.79% of the data. On average, participants took 3,333 ms ($SD = 2,611$ ms) to make their decisions.

A significant interaction between contexts and outcomes obtained: Participants were 74 percentage points more likely to say "yes" to outcome sentences consistent compared to inconsistent with preceding story contexts, $F_1(1, 55) = 1228.86$, $MSE = 0.19$, $p < .001$, $\eta_p^2 = .96$; $F_2(1, 23) = 584.08$, $MSE = 0.239$, $p < .001$, $\eta_p^2 = .96$. Simple effects tests showed this pattern obtained both for stories with success-biasing contexts (a 71.4% difference)—$F_1(1, 55) = 451.61$, $MSE = 0.12$, $p < .001$, $\eta_p^2 = .89$; $F_2(1, 23) = 191.44$, $MSE = 0.17$, $p < .001$, $\eta_p^2 = .89$—and failure-biasing contexts (a 76.7% difference), $F_1(1, 55) = 1169.28$, $MSE = 0.05$, $p < .001$, $\eta_p^2 = .96$; $F_2(1, 23) = 323.99$, $MSE = 0.12$, $p < .001$, $\eta_p^2 = .93$.

Additionally, the enhanced instructions were effective at attenuating the influence of preferences as evidenced by the lack of an interaction between preferences and outcomes. On average, participants were equally likely to say "yes" to outcome sentences consistent or inconsistent with preceding preference statements, $F_1(1, 55) = .02$, $MSE = 0.18$ $p = .880$, $\eta_p^2 < .01$; $F_2(1, 23) = .03$, $MSE = 0.12$, $p = .868$, $\eta_p^2 < .01$. Simple effects tests showed attenuation for stories with success preference (a 2.7% difference in the opposite direction)—$F_1(1, 55) = 1.35$, $MSE = 0.07$, $p = .251$, $\eta_p^2 = .02$; $F_2(1, 23) = 0.55$, $MSE = 0.10$, $p = .468$, $\eta_p^2 = .02$—and failure preference statements (a 2.6% difference), $F_1(1, 55) = .52$, $MSE = 0.11$, $p = .473$, $\eta_p^2 = .01$; $F_2(1, 23) = .23$, $MSE = 0.13$, $p = .635$, $\eta_p^2 = .01$. No other effects were significant (all Fs < 1.8).

In Experiment 5, as in Experiment 4, preferences failed to significantly bias participants' judgments. Following enhanced instructions that warned against and exemplified the influence of affective responses, and that involved practice generating explanations for their judgments, participants no longer exhibited previously observed preferential biases. Given the utility of these instructions, we next examined their effectiveness while partici-

Table 5

Agreement Rates (Percentage "Yes" Responses) and Standard Deviations (in Parentheses) in Experiment 5

Context	Successful outcome	Failed outcome	Mean
	Success preference		
Success-biasing context	87.2 (22.0)	15.2 (19.4)	51.2
Failure-biasing context	11.9 (17.3)	89.3 (18.1)	50.6
Mean	49.6	52.3	
	Failure preference		
Success-biasing context	86.3 (18.8)	15.5 (24.4)	50.9
Failure-biasing context	11.3 (18.3)	87.2 (20.1)	49.3
Mean	48.8	51.4	

pants were placed under time pressure, a condition critically linked to the influence of affect on judgments.

Experiment 6

People often rely on heuristic processing, experiential responses, and affective intuitions when judgments must be made quickly (Denes-Raj & Epstein, 1994; Finucane et al., 2000; Slovic et al., 2002; Svenson & Benson 1993). Recall that previous demonstrations of the effect of preferences on judgments have similarly imposed time pressure in their tasks (e.g., Rapp & Gerrig, 2002, 2006). Thus, evidence that any reliance might be reduced in the face of time pressure would offer a critical demonstration of the effectiveness of the tested interventions. Experiment 6 replicated Experiment 5, with participants now given a time limit for judgments.

Method

Participants. Fifty-six Northwestern University undergraduates, none of whom completed any of the previous experiments, participated for $12 monetary compensation or course credit. All were native English speakers.

Procedure. The procedure was identical to Experiment 5 with the following changes. After practice, an additional page of instructions asked participants to make their judgments as quickly as possible. These instructions were followed by an additional round of practice with three new stories, during which responses that took 3 s or longer were followed by the warning "TOO SLOW" in red font for 2 s. The second set of practice stories did not require participants to explain their judgments and were written like filler stories (i.e., lacking preference- and context-biasing sentences). The experimenter emphasized that if participants saw the warning during the task that they should attempt to respond more quickly in the future.

Results and Discussion

Table 6 presents the results of Experiment 6. We eliminated decision times falling more than three standard deviations above the mean or taking 3 s or longer, a loss of 4.99% of the data.[3] On average, participants took 1,791 ms ($SD = 592$ ms) to make their decisions.

Table 6

Agreement Rates (Percent Yes Responses) and Standard Deviations (in Parentheses) in Experiment 6

Context	Successful outcome	Failed outcome	Mean
	Success preference		
Success-biasing context	88.1 (21.3)	17.6 (25.7)	52.9
Failure-biasing context	14.3 (22.8)	84.2 (23.9)	49.3
Mean	51.2	50.9	
	Failure preference		
Success-biasing context	80.1 (23.9)	17.3 (23.3)	48.7
Failure-biasing context	19.6 (22.5)	82.1 (24.6)	50.9
Mean	49.9	49.7	

Overall, the brief response window influenced the speed with participants made their judgments. Participants took an average of 1.79 s to respond, whereas in Experiment 5, they took an average of 3.33 s (a 1.54 s difference), $F_1(1,110) = 72.09$, $MSE = 988,766$, $\eta_p^2 = .40$, $p < .001$; $F_2(1, 23) = 283.74$, $MSE = 109,834$, $\eta_p^2 = .93$, $p < .001$.

Despite their speedier responses, and as in the previous five experiments, a significant interaction between contexts and outcomes was obtained. Participants were, on average, 66.4 percentage points more likely to say "yes" to outcome sentences consistent with preceding story contexts compared to outcomes inconsistent with those contexts, $F_1(1, 55) = 651.38$, $MSE = 0.28$, $p < .001$, $\eta_p^2 = .92$; $F_2(1, 23) = 457.25$, $MSE = 0.24$, $p < .001$, $\eta_p^2 = .95$. Simple effects tests showed that this pattern obtained both for stories with success-biasing contexts (a 66.7% difference)—$F_1(1, 55) = 335.14$, $MSE = 0.14$, $p < .001$, $\eta_p^2 = .86$; $F_2(1, 23) = 144.08$, $MSE = 0.18$, $p < .001$, $\eta_p^2 = .86$—and for stories with failure-biasing contexts (a 66.2% difference), $F_1(1, 55) = 383.70$, $MSE = 0.12$, $p < .001$, $\eta_p^2 = .88$; $F_2(1, 23) = 133.54$, $MSE = 0.21$, $p < .001$, $\eta_p^2 = .85$.

Most important, despite time pressure, the enhanced instructions and practice were effective at reducing the influence of preferences. On average, participants were equally likely to say "yes" to outcome sentences regardless of whether they were consistent or inconsistent with preceding preference statements, $F_1(1, 55) < .01$, $MSE = 0.18$, $p = .990$, $\eta_p^2 < .01$; $F_2(1, 23) < .001$, $MSE = 0.18$, $p = .983$, $\eta_p^2 < .01$. Simple effects tests showed no significant differences for stories with success preference (a 0.3% difference)—$F_1(1, 55) < .01$, $MSE = 0.12$, $p = .939$, $\eta_p^2 < .01$; $F_2(1, 23) = .02$, $MSE = 0.17$, $p = .893$, $\eta_p^2 < .01$— or failure preference statements (a 0.2% difference in the opposite direction), $F_1(1, 55) = .01$, $MSE = 0.08$, $p = .911$, $\eta_p^2 < .01$; $F_2(1, 23) = .022$, $MSE = 0.19$, $p = .882$, $\eta_p^2 = .01$. These results indicate participants were influenced by preceding contexts but not preferences in making their judgments, despite the inclusion of time pressure that traditionally has been linked to a reliance on affective responses to the materials.

The lack of a significant preference by outcome interaction in Experiments 4, 5, and 6 indicates the influence of preferences was at least attenuated, if not at times eliminated. As a further test of this claim, we conducted a post hoc analysis to approximate our achieved power in all six experiments using Experiment 1 as an estimate of the expected effect size (note the effect size in Experiment 1 was *smaller* than in Experiments 2 and 3). Using G*Power to run a power analysis for a repeated-measures analysis of variance (ANOVA), 56 participants yielded a power of 0.86, above the conventional 0.80 threshold (Faul, Erdfelder, Buchner, & Lang, 2009; Lakens, 2013). Thus, the experimental design had sufficient power to detect a potential preference effect the size of the unadulterated effect from Experiment 1. The marginal effect (by participants) observed in Experiment 4, with 7% greater agreement for success compared to failure outcomes following success preferences might suggest that an affective influence persisted (and our design had power of only 0.51 to detect an effect size half as large

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[3] We also conducted analyses omitting only reading times falling more than three standard deviations above the mean (1.2% of the data), with the critical results analogous to those reported.

as in Experiment 1). However, attenuation is often taken as an important step toward elimination. And when enhanced instructions were implemented in Experiments 5 and 6, preferential biases were reduced such that we found no evidence of their persistence.

As a final demonstration that the preference effect influenced predictions differently in Experiments 1, 2, and 3 compared to 4, 5, and 6, we conducted a repeated-measures ANOVA including all six experiments. An additional between-participants factor (experimental group) categorized each participant in either Experiments 1–3 or Experiments 4–6. As expected, we found a significant three-way interaction between preference, outcome, and experimental group, $F(1, 334) = 20.06$, $MSE = 0.23$, $p < .001$, $\eta_p^2 = .06$. Based on the individual analyses from the six experiments, we interpret this three-way interaction to suggest that the interaction between preference and outcome was markedly stronger in Experiments 1, 2, and 3 than in 4, 5, and 6.

General Discussion

Affective responses influence our perceptions, judgments, and expectations (Slovic, 1995; Zajonc, 1980). People's emotional investments for what they want to happen, and the logical circumstances associated with a situation, mutually inform decisions about future events. In some cases, affective responses and rational evaluations can lead to different sets of expectations. These effects have been identified with respect to the theoretical framework of "the affect heuristic" (Slovic et al., 2002), implicating a privileged role for affective influences over cognitive processes on judgments and decisions, with potential problems arising when more rational considerations are consequently downplayed or ignored. While preferential effects have been consistently demonstrated, the durability of their influence has not been tested, and factors that might alleviate such biases have not been directly evaluated. These are crucial considerations for testing the framework, and for identifying boundary conditions associated with any influence of affect on human judgments and expectations.

In six experiments we sought to address these gaps in the literature by evaluating when preferences exert an impact, and how their influence might be reduced. Experiment 1 exemplified the effect of preferences, showing that judgments for future events are influenced both by the logic of situations and by participants' preferences for the likelihood of those events. In Experiment 2, the inclusion of a delay prior to a decision point, offering a potential cue and time for evaluating the likelihood of event outcomes, did little to reduce the influence of preferences on participants' judgments. In Experiment 3, warnings that authors often try to manipulate their readers' emotions, and instructions to try to avoid making decisions based on such affective responses, also did little to reduce the influence of participants' preferential biases.

While preferences proved resilient, under specific conditions their effect was attenuated and/or eliminated. In Experiment 4, the inclusion of a delay coupled with warnings led to reductions in preferential biases. The combination of these interventions strengthened the instructions, with the delay serving as a reminder for considering the scenarios with respect to earlier articulated warnings. In Experiment 5, the instructions were enhanced by including practice evaluating the scenarios, and requiring participants to explain their decisions during practice. These enhancements led to preferential reductions and were so effective that, in Experiment 6, analogous reductions were obtained even when judgments were made under time pressure. In Experiments 4, 5, and 6, participants' decisions were driven by the logic of scenarios in line with more rational analyses of the unfolding narratives, with little influence of the kinds of subjective preferences associated with an affect heuristic. Overall, the findings from the six experiments indicate that preferences prove quite durable, as substantial intervention was necessary to foster the kinds of rational evaluations that sufficiently mitigate their effects.

The evaluations necessary to overcome preferences were encouraged by at least three factors. First, instructions were intended to help participants think more strategically about the contents of texts, offering warnings to avoid relying on emotional responses. On their own these instructions were insufficient, but when included in a set of activities that involved practice and explanation, participants showed attention to logical contexts and reduced reliance on affective preferences. Second, participants needed to be informed as to the source of their emotional responses (i.e., authors' intentions and manipulations) and that those sources can be worth discounting in the service of more rational contemplation. Third, when instructions did not include practice discounting affective responses, participants needed sufficient time to consider the relevance of emotional and contextual features in determining the likelihood of future events.

Articulating and validating the contributions of these factors provides crucial support to accounts that have considered them as potentially relevant to judgment and decision making. To date, countless instances in which individuals fall victim to heuristics, including affective ones, have been identified. Yet the ways in which potentially problematic reliance on such heuristics might be overcome has received far less attention. In the current study we examined this issue by employing narrative scenarios, as they are consistent with the kinds of contents that people regularly encounter reading stories, watching news programs, and browsing Internet sources. Indeed, narrative scenarios offer a particularly rigorous test of the resiliency of preferences given the regularity with which they encourage affective responses (e.g., Hendrickx, Vlek, & Oppewal, 1989; Sanfey & Hastie, 1998). Stories offer causal sequences that facilitate easy encoding into memory (O'Brien & Myers, 1987; Trabasso & van den Broek, 1985), introducing situations and events that engage readers in their contents (Gerrig, 1993; Green & Brock, 2000). The emotional responses that emerge from these narrative experiences are thus likely to be particularly difficult to mitigate. This is not meant to imply that narratives are in some way "special" compared to other types of materials, but rather that their familiar structure and potentially immersive descriptions foster stronger affective responses than those obtained from list rating tasks, decisions about unconnected statements, and decontextualized problem solving scenarios, which reflect the kinds of materials often used in studies of judgments and decision making.

The findings have important applications not just to considerations of affect and decision making but also for contemporary models of reading. Most models of text processing have focused specifically on reader-, text-, and task-based influences with respect to the kinds of mental representations and understandings that emerge from discourse experiences. Prevailing accounts have highlighted readers' prior knowledge and expertise, the difficulty of text, the coherence of unfolding discourse, the genre of the material, and the strategies that readers adopt to support encoding and retrieval of experienced content as factors that influence

comprehension and memory for text. But these models and accounts rarely if at all have considered how noncognitive contributors such as affect are involved in such activity. The current results indicate that ignoring such factors unduly restricts the purview and validity of any account. Models that attempt to predict the kinds of concepts that are active in memory, or the kinds of inferences and expectations to be derived from a discourse experience, necessarily must include affective responses such as preferences in their articulations. While it remains uncertain as to how much of comprehension is mediated by emotional responses, the current findings indicate they are influential enough to regularly modify rational decisions in surprising and dramatic ways.

Identifying the consequences of affective influences, though, necessitates determining when and how they might exert their effects. Unfortunately, even the precise points at which cognitive influences such as prior knowledge and task strategies inform decisions and understandings of text content have not been specifically localized. These influences might be available online, or might become available after prompting by a task or reminder. Some accounts have even demonstrated that the contents of memory can be active but not necessarily applied toward making decisions (e.g., Kendeou, Smith, & O'Brien, 2013; O'Brien, Rizzella, Albrecht, & Halleran, 1998). We suspect that affective influences exhibit analogous properties, remaining available, once constructed, but proving more or less influential as a function of considerations at potential points of application (e.g., when making a decision following practice with discounting affective biases). One intriguing consideration for this view is that affective responses purportedly emerge earlier than cognitive ones, suggesting that the information activated in memory might be guided by emotional responses. This would indicate that concept activations and the accessibility of information from memory differs from the rational, algorithmic activities normally studied and associated with encoding text and retrieving knowledge. Multimethod approaches that attempt to combine moment-by-moment analyses with product-driven evaluations should prove useful in approximating when preferences exert an influence, as well as identifying whether the interventions described in the current project mitigate that influence during reading or only when decisions are required.

Overall, the data indicated stronger effects of emotional investments with respect to event successes rather than failures, in line with previous work (Rapp & Gerrig, 2006). The texts were thus more effective at encouraging participants to root for characters to succeed than motivating hoped-for failures. Additional sentences or more intensely described situations might be necessary to foster preferences *against* success. This is consistent with "norm theory" (Kahneman & Miller, 1986), which contends that individuals are less likely to prefer what is nonnormative to desire, and all other things being equal, it is more "normal" to desire people succeed than fail. Norm theory also provides further grounding for a consideration of when and how preferences might prove more or less difficult to direct. One obvious possibility is that negative preferences, in general, should be easier to obviate than positive ones. But one less obvious possibility is that if a negative preference is instantiated, it might prove difficult to change given the resistance that had to be overcome to establish that preference in the first place. The current project focused on a specific set of materials previously shown to obtain preferential effects. Assessing the generalizability of any claims about biases toward successes versus failures, as well as about the utility of the interventions that

were tested, will necessitate additional examinations with other materials involving different situations, genres, and contents.

It is important to also note that preferences need not always lead to problematic, short-sighted decisions (Mikels, Maglio, Reed, & Kaplowitz, 2011), in line with the kinds of benefits traditionally associated with heuristic processing. For example, if an individual's desires converge with what scenarios suggest should happen, the result should be stronger expectations and perhaps improved memory for the described events. Additionally, affective preferences have proven useful in public policy campaigns (Dillard, Plotnick, Godbold, Freimuth, & Edgar, 1996), with emotionally distressing images and descriptions linked to risky behaviors such as smoking and drunk driving. For these kinds of materials, the durability of emotional responses proves important; real-world analogs to the variables tested in the current project (i.e., providing warnings; requiring people to generate explanations; querying beliefs about sources of content) offer insight into when and how policy designs might encourage health-conscious behaviors.

As well, eliminating emotional responses would likely prove counterproductive to the intentions of many authors (particularly of fiction), given their goal of getting readers invested in and worried about the events described in their stories. But one important avenue for future research involves evaluating whether authors have specific strategies for encouraging the development of reader preferences, and whether they monitor these considerations in preparing their manuscripts (Rapp, Komeda, & Hinze, 2011). There is a rich base of work considering audience design, in terms of how writers and speakers construct their written and verbal products to fit the goals of an interaction (e.g., Clark & Murphy, 1982; Horton & Gerrig, 2002). Readers' and listeners' emotional responses to those products, the degree to which they operate as intended, and their long-term effects on subsequent decision making, are crucial issues for understanding pragmatic influences on higher order cognitive activity.

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Correction to Reyna et al. (2011)

In the article "Neurobiological and Memory Models of Risky Decision Making in Adolescents Versus Young Adults," by Valerie F. Reyna, Steven M. Estrada, Jessica A. DeMarinis, Regina M. Myers, Janine M. Stanisz, and Britain A. Mills (*Journal of Experimental Psychology: Learning, Memory, and Cognition*, 2011, Vol. 37, No. 5, pp. 1125-1142. doi: 10.1037/a0023943), footnote 5 incorrectly states that correlations among the three measures of past behavior were .704, .731, and .924 for SS, BAS, and BIS respectively. This sentence should read: "Correlations among the three measures of past behavior were .704, .731, and .924."

Likewise, the data in Table 2 were aligned incorrectly for Verbatim measures, Individual differences, and Age in years. The correct version of Table 2 appears below.

Table 2
Factor Solution for Potential Predictors of Risk Taking

Measures	Gist	Age/BIS	SS/BAS	Verbatim/Reserve Framing	Gambling
Gist measures					
Gist Principles	.767				
Categorical Risk	.741				
Global Benefit	−.701				
Global Risk	.612				
Verbatim measures					
Specific Risk				.641	
Quantitative Risk				.690	
Framing[a]				−.626	
Individual differences					
SS			.651		
BAS			.891		
BIS		.759			
Age in years		.768			
Gambling[b]					.833
% of variance	19.47	14.07	11.54	10.60	8.57

Note. All factor loadings greater than .40 are shown. BIS = Behavioral Inhibition Scale; SS = Brief Sensation Seeking scale; BAS = Behavioral Activation Scale.
[a] Refers to the number of gambles selected in the gain frame subtracted from the number in the loss frame (higher = standard framing, lower = reverse framing; range: −9 to +9). [b] Refers to the total number of gambles selected in the framing task (range: 0 to 18).

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