

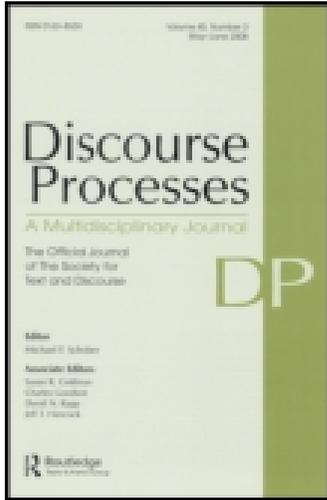
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## Convergent and Divergent Thinking in the Context of Narrative Mysteries

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# Convergent and Divergent Thinking in the Context of Narrative Mysteries

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This project demonstrates how narrative mysteries provide a context in which readers engage in creative cognition. Drawing on the concepts of convergent and divergent thinking, we wrote stories that had either convergent or divergent outcomes. For example, one story had a character give his girlfriend a ring (a convergent outcome), whereas the contrasting version of the story had the character give his girlfriend a gun (a divergent outcome). In Experiment 1, participants took more time to read sentences depicting divergent outcomes. This result replicates past research documenting the impact of expectation violations. Experiment 2 used a speak-aloud paradigm to explore the content of readers' thoughts in the context of convergent and divergent outcomes. Analyses of participants' responses indicated that convergent outcomes prompted people to respond with more features of convergent thinking, whereas divergent outcomes prompted them to respond with more features of divergent thinking. These results support the claim that narrative experiences provide a context for creative cognition.

## INTRODUCTION

Authors routinely craft stories that provide readers with opportunities to participate in their narrative experiences. For example, in the novel *Sons* (Gilbert, 2013), two characters, Jamie and Myron, meet at 2 a.m. in a cemetery. They are there to open a grave. This situation offers readers an occasion to

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contemplate the obvious mystery of Jamie and Myron's intentions. To the extent that readers attempt to generate solutions to this mystery, the actual outcome is still likely to be unforeseen. Readers learn that Jamie and Myron had disturbed the grave once before, just after the funeral. They had sawed away a piece of the coffin and replaced the missing piece with Plexiglas. Then, they installed a camera, capable of recording footage in very dim light. On their 2 a.m. visit, the two men are retrieving the camera. The fact of the camera provides readers with a second mystery: Why the camera?

In this article, we suggest that narrative mysteries of the sort we just illustrated provide readers with opportunities to engage in creative cognition. Readers may draw on their prior knowledge and textual information to generate solutions to the puzzles the narrative provides. Essentially, we claim that creative thinking supplements other processes that underlie narrative understanding. To support that claim, we define narrative mysteries and then establish the relevance of creative cognition to those mysteries. We then provide evidence to support our perspective using a type of mystery that emerges from past research on text comprehension—circumstances in which characters' actions are inconsistent with readers' past experience.

Narratives abound with mysteries: Irrespective of genre, readers quite often face circumstances in which authors withhold information from them (Gerrig, Love, & McKoon, 2009; Gerrig & Wenzel, *in press*; Love, McKoon, & Gerrig, 2010). Gerrig et al. (2009) argued that there are an infinite number of potential mysteries of various sizes dispersed throughout narratives. For the situation in *Sons*, we could generate a long series of questions: Why 2 a.m.? What kind of shovels did they use? Wouldn't people notice the grave had been disturbed? In the same way that readers do not encode all available inferences (e.g., Rieger, 1975), they do not respond to all the available mysteries. The questions are with which mysteries do readers engage, and how?

As a first attempt to address these issues, Gerrig et al. (2009; see also Love et al., 2010) examined a type of mystery in which characters are introduced without any indication of their role in the narrative world. They provided a literary example in which Tim and his ex-wife, Allison, have been chatting while listening to the Grateful Dead (Perrotta, 2007): "She paused, letting Jerry [Garcia] finish a jazzy little run, that clean sunny sound no one else could duplicate. 'So how's Carrie?'" (p. 79). Although Carrie is introduced as a person of some importance, this is the first instance in which she is mentioned in the novel. Gerrig et al. suggested that instances of this sort provide readers with small mysteries they expect the subsequent text to resolve: Readers have a reasonable expectation that the text will reveal Carrie's function in the narrative world. In that context, Gerrig et al. predicted that such characters (i.e., those whose functions were unresolved) would remain relatively accessible in readers' discourse representations until the text provided those functions. The data supported that prediction. In a series of experiments, participants read brief stories that either immediately provided

functional information (e.g., “It’s just that my grandson Brandon hasn’t called in so long,” Carol said.) or did not (e.g., “It’s just that Brandon hasn’t called in so long.”). As they read the stories one line at a time, probe words appeared. Participants attempted to respond as quickly as possible whether the prior text had included the probe word. Participants took less time to indicate that the characters names (e.g., Brandon) had occurred when the characters’ roles remained mysterious. This project indicated a type of mystery with which readers engaged and provided concrete indications of how they did so.

In the current project, we suggest that another fundamental way in which readers engage with mysteries is to undertake creative thinking. In fact, in response to the mystery in *& Sons* (Gilbert, 2013), there are two types of creative processes that readers might implement—*convergent thinking* and *divergent thinking* (Eysenck, 2003; Guilford, 1959). Processes of convergent thinking allow people to fuse ideas, pull concepts together, and find solutions to problems with only one well-defined answer. The seminal convergent thinking test is known as the Remote Associates Test (Bowden & Jung-Beeman, 2003; Mednick, 1962), which requires people to make distal word associations. For example, the Remote Associates Test challenges an individual to generate the single word that connects three words such as crab, pine, and sauce. The correct response is *apple*, because it forms crabapple, pineapple, and applesauce. To solve the mystery of the grave robbery, readers might use convergent thinking to draw together clues from earlier portions of the novel. If the author has provided appropriate clues (as authors sometimes do when they offer up mysteries), readers will be able to encode a correct inference for what Jamie and Myron seek to retrieve from the grave. Readers of *& Sons* know that Jamie had a romantic relationship with the woman whose grave they are opening. Convergent thinking may lead them to conclude that Jamie is seeking to retrieve a sentimental item.

Processes of divergent thinking allow people to form many solutions to problems with ill-defined answers. To measure divergent thinking, researchers often use the classic Alternate Uses Task (Getzels & Jackson, 1962; Guilford, 1967; Wallach & Kogan, 1965). For the Alternate Uses Task, people must generate many uses for common objects, such as a brick. For the moment in *& Sons*, readers may use processes of divergent thinking to generate a variety of possibilities for Jamie and Myron’s intentions. In fact, readers might enjoy the challenge of determining whether any of their “goals of grave robbing” prove to be the correct one that the novel ultimately reveals. (As we noted, we suspect that few readers will have imagined that the purpose was to retrieve a camera.) In many instances of narrative mysteries, readers are likely to engage a combination of convergent and divergent thinking. For *& Sons*, readers might use the products of convergent thinking to constrain their divergent thinking to items of a sentimental nature.

The primary goal of our project is to demonstrate that, at particular narrative moments, readers engage in convergent and divergent thinking. Researchers have

provided several theories to characterize the moment-by-moment processes that guide narrative understanding (for a review, see McNamara & Magliano, 2009). Here, we suggest that processes of convergent and divergent thinking occur at particular moments, embedded within the narrative experiences guided by those basic processes.

Our studies focus on the mysteries that arise when narrative circumstances are inconsistent with readers' prior experiences. For example, we suggested that few readers of *Sons* would have expected that Jamie and Myron were opening the grave to retrieve a camera. Extant research has demonstrated a range of circumstances in which readers' narrative experiences are affected when characters' behavior is inconsistent with what readers might expect. This is the case, for example, when characters' actions are inconsistent with their trait descriptions (Albrecht & O'Brien, 1993; Cook & O'Brien, 2014; O'Brien & Albrecht, 1992; O'Brien, Rizzella, Albrecht, & Halleran, 1998). Thus, readers had longer reading times for the sentence, "Mary ordered a cheeseburger and fries," when prior context had described Mary as a vegetarian rather than a junk food addict. Similarly, readers have more difficulty understanding actions that are inconsistent with characters' goals. Thus, when a character named Dick had as his explicit goal to vacation "where he could swim and sunbathe" (Huitema, Dopkins, Klin, & Myers, 1993, p. 1054), readers find it more difficult to read a sentence in which he selects a trip to Alaska versus one in which he selects a trip to Florida (see also Egidi & Gerrig, 2006; Poynor & Morris, 2003). Readers also experience difficulty when new information fails to find a causal link to previous information in the text—which is more likely to happen when characters' behavior provides an inconsistency (e.g., Zwaan, Magliano, & Graesser, 1995).

This body of research has generated a lot of important conclusions about the processes that underlie ordinary reading. For example, Cook and O'Brien (2014) argued that these reading time effects emerge because "readers attempt to compare currently active information against their general world knowledge" (p. 37). We intended our research as an indication of what might happen next, once this process of comparison is complete. We asked a different question: What type of thinking is set in motion when Mary orders a cheeseburger or Dick chooses an Alaskan vacation? These behaviors provide mysteries. We suggest that readers respond by engaging in creative thinking. In addition, recall the findings that participants take longer to indicate that they have understood sentences that are inconsistent with expectations based on background knowledge. We suggest that some of that delay arises because readers pause to focus creative thought on the inherent mysteries of these inconsistencies.

To provide a demonstration of such creative thought, we wrote stories that provided *convergent* and *divergent outcomes*. Consider the sample story in Table 1. The story describes a day in the life of Lucy and Daryl. The couple is madly in love and goes on a series of romantic dates. During dinner at a fancy restaurant, Daryl is

TABLE 1  
Lucy and Daryl's Date

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Lucy and Daryl had been dating for several years and were madly in love. One afternoon, Daryl and Lucy took a walk in the park where they had gone on their first date. When they got to a scenic spot, Daryl held Lucy's hand and asked her if she would like to go to a fancy dinner with him at their favorite French restaurant. Lucy gladly accepted the invitation to go on such a romantic date. That night, Daryl picked Lucy up at her apartment. He complimented Lucy on her outfit and said, "You look beautiful tonight, as usual."

When they arrived at the restaurant, the host seated them at a table by the window that overlooked a charming pond. The couple ordered a bottle of red wine and began talking about what they would have for dinner. Daryl felt nervous as they talked, because he was concealing something under his coat. The object dug sharply into the left side of his ribcage.

It was a gift that he could not wait to give Lucy. Daryl was never good at keeping secrets from her, so he quickly put the box on the table. When she saw the box, Lucy almost jumped out of her seat.

Lucy got even more excited as Daryl handed her the package. She opened it and examined the contents for a moment.

*Convergent outcome:* The box contained a ring.

*Divergent outcome:* The box contained a gun.

She realized exactly what this moment would mean (reaction sentence). Lucy leapt across the table and gave Daryl a long kiss on his lips. Daryl kissed Lucy back just as the waiter arrived to take their orders. They both got the braised duck with smashed potatoes.

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concealing a box under his coat. But what is in the box? In one version of the story, the box contains a ring. We call the ring a *convergent outcome*. It is appropriate and converges with the narrative context. In a different version of the story, the box contains a gun. We call the gun a *divergent outcome*. It is novel and diverges from the prior context. After the outcome is revealed, the story continues with a neutral response we call the *reaction sentence* (i.e., "[Lucy] realized exactly what this moment would mean."). The story ends with the couple ordering dinner.

In Experiment 1, we addressed the reading time consequences of the contrast between the convergent and divergent outcomes. (Note that we called them convergent and divergent outcomes because, for Experiment 2, we suggest the different outcomes lead to disproportionate convergent and divergent thought.) As we noted earlier, researchers have demonstrated that participants take longer to understand sentences that provide information that is inconsistent, in various ways, with what readers might expect (Albrecht & O'Brien, 1993; Huitema et al., 1993). Based on this prior literature, we predicted that participants would find divergent outcomes more difficult to assimilate to their discourse representations than convergent outcomes. Recall the story about Lucy and Daryl. We would expect that textual information would resonate through readers' background knowledge in a way that would make the concept of *ring* but not the concept of *gun* relatively accessible (Myers & O'Brien, 1998; O'Brien & Myers, 1999). As such, readers should find it easier to assimilate the version of the story in which the box contains a ring. This result provides a replication of extant literature.

Experiment 2 captured our novel goal, which was to illuminate what might happen next. When Daryl gives Lucy a ring, that behavior provides a mystery that should be easy for readers to solve with convergent thinking. Although the text does not assert that Daryl has proposed, readers will likely encode that inference through convergent processes. When Daryl presents a gun, the mystery is considerably deeper. Readers will more likely engage in divergent thinking to try to explain that unexpected occurrence. For Experiment 2 we predicted that the convergent and divergent outcomes would prompt readers to engage in different types of thoughts.

Thus, the purpose of Experiment 2 was to capture the content of people's responses to the outcomes. We conducted a speak-aloud experiment in which people listened to audio versions of stories and generated verbal responses. Our overarching prediction was that the convergent outcomes would prompt readers to produce content that was consistent with convergent thought processes, whereas the divergent outcomes would prompt content consistent with divergent thought processes. To test this prediction, we drew on past research that has documented the processes and products of the two types of thinking (for reviews see Amabile, 1982, 1996; Cropley, 2006; Cropley & Cropley, 2008a; Eysenck, 2003). We identified features that we could observe in people's verbal productions that provided contrasts between convergent and divergent thought:

### Certainty and Uncertainty

According to Cropley (2006), convergent thinking is associated with "closure on an issue" and "a feeling of security and safety," whereas divergent thinking is associated with "exciting or risky possibilities" and "a feeling of uncertainty and excitement" (p. 392). As we noted earlier, the desired product of convergent thinking is the solution to a problem with one answer. Thus, when people arrive at a convergent solution, they typically have reasonable certainty they are correct. However, people who engage in divergent thinking generally understand they may not yet have arrived at a correct solution. Thus, we expect people will express relative certainty that they have arrived at the correct understanding of the convergent outcomes (e.g., when Lucy receives a ring). For the divergent outcomes (e.g., when Lucy receives a gun), people should express more uncertainty that they have arrived at correct explanations.

### Emotional Responses

Cropley (2006) noted that divergent thinking is related to surprise and excitement, whereas convergent thinking is related to familiarity and closure. Thus, we expect that people would be more likely to produce overt emotional content when they reflect on the divergent outcomes. Note that researchers have documented a complex relationship between emotions and creative performance (for a review,

see De Dreu, Baas, & Nijstad, 2008). For example, both positive and negative emotional states improve divergent thinking performance, but only positive affect improves convergent thinking performance (Lin, Tsai, Lin, & Chen, 2014). Thus, we expect the emotional responses generated by the divergent outcomes would quite generally create a context for improved contemplation of those outcomes.

### Self-Reflections

As people interpret story events, they draw on their own life experiences encoded in long-term memory (Kintsch, 1988, 1998). Cropley (2006) stated that “Convergent thinking is also intimately linked to knowledge: On the one hand, it involves manipulation of existing knowledge by means of standard procedures; and on the other hand, its main result is production of increased knowledge” (p. 391). As people respond to the stories, they have the opportunity to relate the events directly to their own lives by offering self-reflections. Because convergent thinking is so tightly bound to memory, we expected convergent outcomes to elicit more self-reflections, compared to the divergent outcomes, based on participants’ personal memory representations.

### Positive and Negative Appraisals

When people contemplate the products of creative thought, they often pass judgment on the quality of those products (Cropley & Cropley, 2008a, 2008b). People generally have more positive responses to events they find easy to relate to prior experience versus those they do not (Eidelman, Crandall, & Pattershall, 2009; Zajonc, 2001). Recall that convergent thinking draws on existing memory representations (Cropley, 2006). As such, we expect convergent outcomes to be more familiar to people and, thus, prompt more positive responses. By contrast, the divergent outcomes involve unfamiliar concepts that generate uncertainty. When people experience uncertainty, they experience a negative bias toward creativity (Mueller, Melwani, & Goncalo, 2012). Because we expect people’s responses to divergent outcomes will be marked by uncertainty, we also expected to find more negative appraisals for those outcomes. In Experiment 2, we use this series of features to demonstrate that people’s experience of convergent and divergent outcomes have different consequences for their subsequent thought processes.

## EXPERIMENT 1

The purpose of Experiment 1 was to demonstrate that divergent outcomes to narrative mysteries would cause readers to slow down, relative to convergent outcomes. Our prediction emerged from past research that has documented the

memory processes that underlie readers' sensitivity to the consistency between readers' background knowledge and characters' behavior. Here, we offer a supplemental explanation for that relative slowdown in reading times: We argue that readers contemplate the mysteries divergent outcomes present.

## Methods

### *Participants*

Participants in Experiment 1 were 27 Stony Brook University undergraduates who participated for partial course credit. We removed three participants due to computer error, two for failing to do well enough on a series of comprehension questions (i.e., they answered less than 80% correct), and two for not finishing the experiment in the allotted time. That left 20 participants.

### *Materials and Apparatus*

*Experimental stories.* There were 16 experimental stories, each containing a primary mystery. The mysteries were always about an object that was hidden in a specific container. There were two possible outcomes for objects found in each container—one convergent and one divergent. For example, in the story about Lucy and Daryl (Table 1), Daryl concealed either a ring (convergent) or a gun (divergent) in a box. In another story, Ty encounters either burgers (convergent) or diamonds (divergent) in a cooler. The convergent and divergent outcome sentences were identical, except for the critical object. We matched the convergent and divergent objects for number of words and syllables. The convergent outcome sentences had a mean of 26.4 characters ( $SD = 7.2$ ), and the divergent outcome sentences had a mean of 25.9 characters ( $SD = 7.8$ ). The critical word always appeared at the end of the outcome sentence. After each outcome sentence, another sentence described a character's neutral reaction to the outcomes. The neutral reaction sentences were identical for convergent and divergent outcomes. See Appendix A for sample experimental stories.

Three true–false comprehension questions accompanied each experimental story. We randomly chose eight stories to have two true answers and one false answer. The other eight stories had one true answer and two false answers. Appendix A provides examples of these comprehension questions.

*Filler stories.* There were eight filler stories. We included filler stories to limit the possibility that people would guess the purpose of the experiment. Like the experimental stories, the filler stories contained a mystery. However, those mysteries were never solved. See Appendix B for sample filler stories.

Each filler story was accompanied by three comprehension questions. In the same way that comprehension questions related to experimental stories, half of

the filler stories had two true answers and one false answer, whereas the other half had one true answer and two false answers.

*Practice stories.* There were two practice stories with corresponding comprehension questions. The practice stories were in the same format as the filler stories.

*Apparatus.* We presented the stories with a Dell Optiplex (Dell, Round Rock, TX) desktop computer and keyboard, using DirectRT software (Empirisoft, New York, NY). The text appeared on a black background in white 16-point font.

### *Design and Procedure*

*Design.* We used a Latin square to assign the two versions of each experimental story to two lists in a counterbalanced fashion. Participants all read the same practice and filler stories.

*Procedure.* After giving informed consent, participants read instructions on the computer. After reading the instructions, participants read the practice stories to acclimate to the procedure. Participants read stories one sentence at a time. To move from one sentence to the next, they pressed the spacebar. After reading each practice story, they answered the comprehension questions in randomized order. Participants heard a short beep and answered the comprehension questions by pressing the / key labeled *Yes* or the Z key labeled *No*. At the end of the practice stories, the experimenter informed participants that the practice stories were done and answered any questions they might have had.

Finally, each participant read the experimental and filler stories in a different random order and answered the corresponding comprehension questions. Participants followed the same procedure to complete these stories as the practice stories. At the end of the experiment, the experimenter debriefed participants. The experiment took less than an hour to complete.

### Results and Discussion

To prepare the data for analysis, we pruned reading time outliers by condition. To do so, we removed reading times that were less than 300 ms. In addition, we removed reading times that were more than 3 *SDs* above each condition mean. As a result, we removed five data points out of 320 total observations, or 1.56% of the data. We conducted two-way mixed repeated-measures ANOVAs on the outcome sentences with reading times as a within-subjects factor and the counterbalancing conditions as a between-subjects nested factor. We conducted separate ANOVAs using participants ( $F_1$ ) and items ( $F_2$ ) as random variables.

The goal of Experiment 1 was to demonstrate that divergent outcomes would cause readers to slow down, relative to convergent outcomes. As predicted, there

was a significant main effect of outcome type, such that reading times were longer for divergent outcomes ( $M = 1,760$  ms,  $SD = 481$  ms) than convergent outcomes ( $M = 1,283$  ms,  $SD = 330$  ms) ( $F_1(1,18) = 37.64$ ,  $MSe = 2,279,397.46$ ,  $p < .001$ , partial  $\eta^2 = .68$ ;  $F_2(1,14) = 39.82$ ,  $MSe = 1,798,003.18$ ,  $p < .001$ , partial  $\eta^2 = .74$ ).

Some past research has found an effect of inconsistency beyond the target sentence (e.g., Albrecht & O'Brien, 1993). In accord with that literature, we examined the reading times for the neutral reaction sentences that followed the outcomes. Participants were slower to read the reaction sentences after divergent outcomes ( $M = 2,292$  ms,  $SD = 609$  ms) than after convergent outcomes ( $M = 2,155$  ms,  $SD = 596$  ms). However, that difference was not significant ( $F_1(1,18) = 1.85$ ,  $MSe = 190,036.89$ ,  $p = .19$ , partial  $\eta^2 = .09$ ;  $F_2(1,14) = 1.42$ ,  $MSe = 162,481.67$ ,  $p = .25$ , partial  $\eta^2 = .09$ ).

Experiment 1 replicated past findings that readers take longer to understand texts in which characters' behaviors are inconsistent with readers' expectations based on background knowledge. Specifically, participants took longer to read divergent outcome sentences than convergent outcome sentences. The effect did not carry over to the subsequent sentences in which characters made neutral reactions. These results are consistent with the conclusion that readers compare active information with their world knowledge (e.g., Cook & O'Brien, 2014). However, we offer a supplemental explanation for longer reading times: We suggest that our readers were engaging processes of creative thought to contemplate the mystery of why characters would have behaved in an unexpected fashion. We designed our second experiment to document the features of that creative thought.

## EXPERIMENT 2

The purpose of Experiment 2 was to capture the content of people's thoughts in response to the convergent and divergent outcomes. In general, we expected readers to respond with relatively more convergent-like thinking in response to the convergent outcomes and more divergent-like thinking in response to the divergent outcomes. In the Introduction, we derived predictions based on research that examined the characteristic features of the two types of thought. We predicted that after experiencing convergent outcomes, people would express more certainty, more self-reflections, and more positive appraisals as they thought aloud. We predicted that after experiencing divergent outcomes, people would express more uncertainty, more emotional responses, and more negative appraisals. Table 2 provides example responses by category.

In this experiment we asked participants to speak their thoughts aloud as they listened to audio versions of the stories. We used audio stories rather than text versions of the stories because we believed it would be more natural for people

TABLE 2  
Experiment 2: Speak-Aloud Categories and Examples

<i>Category</i>	<i>Examples</i>
Certainty	“I had a feeling it was a shark since he is surfing and normally sharks come toward surfers.”
Uncertainty	“The gold coins should tell her that they were rich or it was a pharaoh.”
	“What would it mean if somebody gave me a gun on my date? What?” “Why would a shovel be in an instrument case?”
Emotional responses	“Shock!” “(Laughs) What is happening here? I thought he was surfing. How did he see a bear? That’s actually pretty hysterical (Laughs).”
Self-reflections	“Hmm, a dollar can’t really buy you much. But I mean, when I was younger, a dollar could buy me two bags of chips and a juice.” “I love Brad Pitt.”
Positive appraisals	“That was very nice of the guy.” “That’s really cute.”
Negative appraisals	“I think it’s kinda weird that they would put a wig underneath his pillow.” “That is really scary.”

to listen and then speak their thoughts aloud rather than to read in silence and then speak. (We do not have data from text presentations of the stories to support this intuition.) In the experiment we used two probe points. The first probe point was directly after the convergent or divergent outcomes. That probe point allowed us to capture readers’ thoughts immediately after experiencing the outcomes. The second probe was one sentence later after the neutral reaction sentences. We chose that second probe point to determine whether participants’ responses were affected by the fact that the characters’ responses were neutral. For example, Lucy did not respond badly after receiving a gun. In real-life social situations, people often use information from other individuals to determine how they should react to unfolding events (for a review, see Cialdini & Goldstein, 2004). In that context, it is possible that the features of participants’ thoughts might change after characters’ neutral reactions. As another, more practical consideration, we used the two possible response positions to make it more difficult for people to predict when they would be prompted to speak aloud.

## Methods

### *Participants*

Participants in Experiment 2 were 20 Stony Brook University undergraduates who participated for partial course credit.

### *Materials and Apparatus*

*Experimental stories.* The 16 experimental stories were audio recordings of the 16 experimental stories used in Experiment 1.

#### RECORDING EXPERIMENTAL STORIES

To create the audio stories, one of the experimenters directed a female narrator to first record the convergent and divergent outcome manipulation words in a randomized order. She did so before reading any of the stories so that she was naive to the story contexts in which the words would be embedded. The narrator announced the words enthusiastically, as if reading them to first grade students.

Next, the narrator read the 16 experimental stories in a random order. Her goal was to read the stories with natural inflection and dynamics but also to maintain an overall consistent volume and tempo. As she read, the experimenter monitored the volume through headphones and by watching a visual volume meter on the computer screen. If the narrator made a mistake while reading a sentence, she continued reading from the beginning of that sentence. The experimenter marked on a printed script where to edit any mistakes during post-production. When the narrator reached the manipulation sentence in each story, she read up to the word before the manipulation word (e.g., “The cooler was filled with a dozen . . .”), and then she paused. After a brief pause, she continued on to the neutral reaction sentence and through the end of the story.

After the words and stories were recorded, the experimenter fixed any mistakes that occurred during recording and performed a rough mastering of the volume across tracks to ensure consistent volume across stories. In addition, the experimenter cut and pasted the convergent and divergent outcome words into the stories to create two versions. The only thing that differed between versions of each story was the one critical word (e.g., “burgers” versus “diamonds”). The experimenter matched the volume, onset, and duration of the critical words across the different versions of each story.

#### PROBE POSITIONS FOR EXPERIMENTAL STORIES

The goal of having probe positions was to allow for two breaks in each story where a visual speak-aloud probe would appear. For the experimental stories, we randomly chose the first probe point for each story that came at the end of a sentence and occurred somewhere after the first three sentences of the story. In addition, the first probe point came at least three full sentences before the start of the outcome manipulation sentence. The first probe in each story was filler and was meant to keep participants engaged before the critical second probe. We varied the second probe point, which occurred in two possible positions. That is, the second probe position came either directly after the outcome of the mystery or after the neutral reaction sentence. We call those probe points *convergent-outcome*, *convergent-reaction*, *divergent-outcome*, and *divergent-*

*reaction* (where, for example, convergent-outcome refers to the probe position after the convergent outcome).

We formed two versions of each convergent and divergent story by splitting the stories into three segments. The first segment was always from the beginning of a story to the first randomly chosen probe position. The second segment was from the first probe position to the second probe position that followed the outcome or the reaction sentence. The third segment was from the second probe position to the end of the story.

*Practice stories.* There were two practice stories. The practice stories were audio versions of the same practice stories used in Experiment 1.

#### RECORDING PRACTICE STORIES

The same female narrator, again, read each story enthusiastically as if reading to children. As before, one of the experimenters directed her to control volume and tempo. There was no need for the narrator to pause during the practice stories, so she always read nonstop from beginning to end. The experimenter dealt with errors in the same way as the experimental stories and mastered the volume of practice stories to be consistent with the experimental stories.

#### PROBE POSITIONS FOR PRACTICE STORIES

For the practice stories, we randomly chose two probe points that occurred between sentences after the first three sentences of each story. In addition, at least three sentences separated the probe positions, and a probe could not come after the final sentence. We split the stories into three segments at the probe positions.

*Visual probe.* The visual probe was a 10 × 10-inch light blue box with the words “Speak Your Thoughts” in white 100-point font and “You have one minute, or you can press the spacebar to continue when you are sure you are done speaking” in white 18-point font.

*Apparatus.* We presented the audio stories and visual probes through a Dell Optiplex desktop computer using DirectRT software, with stereo audio playback from speakers on each side of the screen. We used a Telex M-560 (The Bosch Group, Stuttgart, Germany) microphone to record participants’ verbal responses.

To record the audio stimuli, we used a MacBook Pro laptop computer (Apple, Cupertino, CA), Audible Live Lite 8 (Ableton, Pasadena, CA) recording software, a Focusrite Saffire 6 (Focusrite, High Wycombe, United Kingdom) USB audio interface, an XLR cable, Audix ADX51 (Audix, Wilsonville, OR) condenser microphone with phantom power, a tripod microphone stand with boom, and headphones. We added a subtle reverb effect on the tracks for warmth. The experiment also used Audacity audio software (Audacity, no location) to listen to participants’ responses for the purpose of transcription.

### *Design and Procedure*

*Design.* Experiment 2 had four conditions with a  $2 \times 2$  design. We counterbalanced and randomized the experimental stories across conditions with a Latin square. As such, each condition had eight mysteries with convergent outcomes and eight with divergent outcomes. In addition, we paired convergent and divergent outcomes with a probe that appeared after the outcome or reaction sentence. We also counterbalanced and randomized the probe positions across conditions. Then, we randomized the order of the stories and assigned story types to the conditions of convergent-outcome, convergent-reaction, divergent-outcome, and divergent-reaction. Therefore, each condition had four convergent stories with outcome probes, four convergent stories with probes that appeared after the neutral reaction sentence, four divergent stories with outcome probes, and four divergent stories with probes that appeared after the neutral reaction sentence.

*Procedure.* After participants gave informed consent, they read instructions on the computer. Next, participants completed the practice stories. They listened to the stories, and when each story paused and the visual probe appeared, participants spoke responses out loud. The experimenter stayed in the room with participants during the practice stories. If a participant successfully spoke their thoughts (i.e., said anything at all), the experimenter used phrases like “good” and “okay” to signal participants they were doing the task correctly. If the participant did not speak when the visual probe appeared, the experimenter would say something along the lines of, “What are you thinking? Say whatever is on your mind. There are no right or wrong things to say.” If the participant spoke too softly, the experimenter asked the participant to speak up. In addition, participants had the opportunity to ask any questions they might have had. Only a few participants had questions, such as “How many stories will I listen to?” or “Should I only talk about the stories?” The experimenter answered questions about the number of stories by saying something like “You’ll be listening to a decent number of stories, but you will have plenty of time to finish.” The experimenter answered questions about whether responses should focus only on the stories by saying something like “That might often be the case, but there are no right or wrong things to say. Say whatever comes to mind.” At the end of the practice stories, participants pressed the spacebar to continue with the experiment.

Finally, participants completed the experimental stories. Each participant listened to the stories in a different random order. Participants spoke aloud when the stories paused and the visual probe appeared on the computer screen. They had a maximum of one minute to speak their thoughts. If they finished speaking in less than a minute, they could press the spacebar to continue the stories. At the end of the experiment, the experimenter debriefed participants. Experiment 2 took less than an hour to complete.

## Results and Discussion

To begin the analyses, we had coders transcribe the verbal responses and then sort them into the various response categories (Table 2). Three coders used Audacity audio software to listen to participants' verbal responses (32 responses  $\times$  20 participants = 640 total responses). The coders worked as a team, splitting the workload roughly equally, to transcribe each verbal response into text. After transcribing the responses as a team, the coders split up to categorize their own complete set of responses. For each coder's set of responses, we stripped subject and condition numbers to keep coders blind to that information. Next, we separately randomized the order of all 640 responses for each coder. Before doing any actual coding, the coders studied the list of pre-established categories. After studying the category definitions, coders worked sequentially through the responses, classifying the ideas into one or more categories. Note that it was possible for individual idea units to fit into multiple categories. We instructed coders to include idea units in all the categories that they deemed appropriate.

When all coders finished coding the entire set of responses, we tested the extent to which the coders agreed with one another. We calculated a two-way random effects intraclass correlation coefficient for average measures of absolute agreement (Landers, 2011; Nichols, 1998; Shrout & Fleiss, 1979). The results showed that 75% of the variance in the category coding was picked up by the three coders,  $ICC(2,3) = .75$  (where ICC indicates intraclass correlation coefficient). An intraclass correlation coefficient value of .75 is considered excellent (Cicchetti, 1994). We resolved all differences in coded responses between coders by a majority rule. That is, if at least two-thirds of the coders had, or had not, placed a response into a specific category, then that is how we coded the response. For example, if at least two-thirds of the coders said a response fit into the uncertainty category, then we counted that response as having been uncertain. However, if only one coder said a response fit into the uncertainty category, then we did not count that response as uncertain. All responses met these criteria.

Table 3 provides examples of participants' utterances. These examples display the richness of participants' responses. The examples also indicate why we could not directly compare, for example, the overall creativity of participants' responses. The responses are so bound to particular narrative contexts that it would not have been informative to ask judges to make comparisons across the categories. In a sense, we would have been asking judges to decide whether a response on a remote associates test was more creative than a response on an alternate uses test. The example responses also indicate why we did not just measure the duration of participants' utterances. We cannot be certain how long participants would engage with the outcomes were they not specifically encouraged to speak aloud. For both of these reasons, we turned to specific

TABLE 3  
Experiment 2: Response Examples by Outcome and Probe Position

<i>Outcome</i>	<i>Outcome Examples</i>	<i>Probe Position</i>	<i>Response Examples</i>
Convergent	The box contained a ring.	Outcome	That's really exciting and um the whole setting seems really romantic and the way they are acting seems like they are in love, but without the ring you could have thought that it's their first date. Um, I think that's really sweet and, um, that's not very—I'm not really experienced with knowing how this happens, but I would expect for him to get down on one knee rather than just showing her the box.
		Reaction	I think it was pretty sweet. Uh, he didn't really ask her the question "will you marry me." He just put the ring on the table I guess, and she picked it up, and I guess she really wanted to marry him. She—they—they seem like they're in love.
Divergent	The box contained a gun.	Outcome	Yeah, that was shocking. I would have expected a ring (Laughs).
		Reaction	Does he want her to kill herself, her to kill him, or her to kill somebody else? I think this is a really strange gift. I would not be happy to receive this. I would be really really scared.

features of participants' utterances to test the hypothesis that the convergent and divergent outcomes engendered different types of creative thought.

As we noted in the Introduction, we made specific *a priori* predictions for certainty and uncertainty, emotional responses, self-reflections, and positive and negative appraisals. Recall that we captured people's verbal responses after the outcomes and after the characters' neutral reactions to those outcomes. For each cell of the design, we report data as percentages based on how often participants' responses bore the features of particular categories. Consider, for example, responses participants made directly after divergent outcomes. We report the percentage of occasions on which such responses included positive appraisals, self-reflections, and so on. Thus, we did not attempt to make judgments about whether a particular response included more than one token within each category. All results are shown in [Table 4](#).

### *Certainty and Uncertainty*

We predicted that convergent outcomes would prompt people to make more certain responses. In contrast, we predicted that divergent outcomes would prompt people to make more uncertain responses. To test our predictions, we conducted a pair of  $2 \times 2 \times 2$  mixed repeated-measures ANOVAs with outcome and response position as within-subject factors and counterbalancing condition as

a nested between-subjects factor. For each analysis, we conducted separate ANOVAs using participants ( $F_1$ ) and items ( $F_2$ ) as random variables.

*Certainty.* As predicted, there was a significant main effect of outcome, such that convergent outcomes prompted people to make more certain responses than when they encountered divergent outcomes ( $F_1(1,16) = 10.84$ ,  $MSe = .957$ ,  $p = .01$ , partial  $\eta^2 = .40$ ;  $F_2(1,12) = 12.29$ ,  $MSe = .77$ ,  $p = .004$ , partial  $\eta^2 = .51$ ). There was no main effect of response position and no interaction between outcome and response position (all  $F < 1.09$ , all  $p > .10$ ).

*Uncertainty.* As predicted, there was a significant main effect of outcome. Divergent outcomes, as compared with convergent outcomes, prompted people to make more uncertain responses ( $F_1(1,16) = 16.23$ ,  $MSe = 1.13$ ,  $p = .001$ , partial  $\eta^2 = .50$ ;  $F_2(1,12) = 14.07$ ,  $MSe = .90$ ,  $p = .003$ , partial  $\eta^2 = .54$ ). There was no main effect of response position and no interaction between outcome and response position (all  $F < 2.64$ , all  $p > .10$ ).

### *Emotional Responses*

We expected divergent outcomes to prompt more emotional responses than convergent outcomes. To test our prediction, we conducted a  $2 \times 2 \times 2$  mixed repeated-measures ANOVA with outcome and response position as within-subject factors and counterbalancing condition as a nested between-subjects factor.

As predicted, there was a significant main effect of outcome, such that divergent outcomes caused people to make more emotional responses than convergent outcomes ( $F_1(1,16) = 7.13$ ,  $MSe = .15$ ,  $p = .02$ , partial  $\eta^2 = .31$ ;  $F_2(1,12) = 6.39$ ,  $MSe = .12$ ,  $p = .03$ , partial  $\eta^2 = .35$ ). There was no main effect of response position ( $F_1(1,16) = 2.17$ ,  $MSe = .05$ ,  $p = .16$ , partial  $\eta^2 = .12$ ;  $F_2(1,12) = 1.71$ ,  $MSe = .04$ ,  $p = .22$ , partial  $\eta^2 = .13$ ). By participants, there was no interaction between outcome and response position ( $F_1(1,16) = 2.25$ ,  $MSe = .05$ ,  $p = .15$ , partial  $\eta^2 = .12$ ). However, by items, the interaction was marginally significant ( $F_2(1,12) = 4.00$ ,  $MSe = .04$ ,  $p = .07$ , partial  $\eta^2 = .25$ ). Because the interaction was not significant by participants and only marginally significant by items, we did not attempt to interpret the interaction.

### *Self-Reflections*

We predicted that convergent outcomes would prompt people to respond with more self-reflections, as compared with divergent outcomes. To test our prediction, we conducted a  $2 \times 2 \times 2$  mixed repeated-measures ANOVA with outcome and response position as within-subject factors and counterbalancing condition as a nested between-subjects factor.

As predicted, the main effect was significant, such that convergent outcomes prompted more self-reflections than did divergent outcomes ( $F_1(1,16) = 5.54$ ,  $MSe = .113$ ,  $p = .03$ , partial  $\eta^2 = .26$ ;  $F_2(1,12) = 5.54$ ,  $MSe = .09$ ,  $p = .04$ , partial  $\eta^2 = .32$ ). There was no main effect of response position and no interaction between outcome and response position (all  $F < 1$ , all  $p > .10$ ).

### *Positive and Negative Appraisals*

We predicted that convergent outcomes would prompt people to make more positive appraisals, whereas divergent outcomes would prompt more negative appraisals. To test our predictions, we conducted a pair of  $2 \times 2 \times 2$  mixed repeated-measures ANOVAs with outcome and response position as within-subject factors and counterbalancing condition as a nested between-subjects factor.

*Positive appraisals.* As predicted, there was a significant main effect of outcome, such that convergent outcomes prompted more positive appraisals than divergent outcomes ( $F_1(1,16) = 7.35$ ,  $MSe = .345$ ,  $p = .02$ , partial  $\eta^2 = .32$ ;  $F_2(1,12) = 5.03$ ,  $MSe = .28$ ,  $p = .045$ , partial  $\eta^2 = .30$ ). By participant, there was no main effect of response position ( $F_1(1,16) = 1.53$ ,  $MSe = .063$ ,  $p = .23$ , partial  $\eta^2 = .09$ ). However, by items there was a main effect of response position ( $F_2(1,12) = 5.17$ ,  $MSe = .05$ ,  $p = .04$ , partial  $\eta^2 = .30$ ). As shown in Table 4, participants made more positive appraisals after the outcomes than after the neutral reactions. This may be a case in which the neutrality of characters' reactions muted participants' initial thoughts about the outcomes. It is possible that neutral reaction sentences, on some occasions, undermined readers' positive enthusiasm for some outcomes. In addition, there was no significant interaction between outcome and response position ( $F_1(1,16) = 3.03$ ,  $MSe = .10$ ,  $p = .10$ , partial  $\eta^2 = .16$ ;  $F_2(1,12) = 2.28$ ,  $MSe = .08$ ,  $p = .16$ , partial  $\eta^2 = .16$ ).

*Negative appraisals.* As predicted, there was a significant main effect of outcome, such that divergent outcomes prompted more negative appraisals than convergent outcomes ( $F_1(1,16) = 25.93$ ,  $MSe = .851$ ,  $p < .001$ , partial  $\eta^2 = .62$ ;  $F_2(1,12) = 29.43$ ,  $MSe = .68$ ,  $p < .001$ , partial  $\eta^2 = .71$ ). There was no main effect of response position and no interaction between outcome and response position (all  $F < 1$ , all  $p > .10$ ).

Overall, the results confirmed our predictions. Convergent outcomes prompted people to respond with more convergent-like thinking, whereas divergent outcomes prompted them to respond with more divergent-like thinking. Specifically, convergent outcomes caused people to respond with certainty, make more self-reflections, and make more positive appraisals. In contrast, divergent outcomes caused people to respond with uncertainty, make more emotional responses, and make more negative appraisals. For all categories of responses,

TABLE 4  
 Mean Percentages (and SDs) for Each Category of Response by Outcome Type  
 and Probe Position

<i>Convergent</i>		<i>Divergent</i>	
<i>Outcome</i>	<i>Reaction</i>	<i>Outcome</i>	<i>Reaction</i>
<i>Certainty</i>			
71.25% (24.70%)	70.00% (27.63%)	45.00% (27.63%)	52.50% (32.34%)
Combined Mean		Combined Mean	
70.63% (25.87%)		48.75% (29.93%)	
<i>Uncertainty</i>			
23.75% (23.61%)	31.25% (24.16%)	47.50% (24.20%)	55.00% (32.04%)
Combined Mean		Combined Mean	
27.50% (23.89%)		51.25% (28.28%)	
<i>Emotional responses</i>			
8.75% (16.77%)	8.75% (14.68%)	12.50% (26.28%)	22.50% (21.31%)
Combined Mean		Combined Mean	
8.75% (15.56%)		17.50% (24.15%)	
<i>Self-reflections</i>			
15.00% (20.52%)	16.25% (21.88%)	6.25% (13.75%)	10.00% (18.85%)
Combined Mean		Combined Mean	
15.63% (20.95%)		8.13% (16.40%)	
<i>Positive appraisals</i>			
26.25% (22.18%)	27.50% (19.70%)	20.00% (27.63%)	7.50% (14.28%)
Combined Mean		Combined Mean	
26.88% (20.71%)		13.75% (22.61%)	
<i>Negative appraisals</i>			
8.75% (12.23%)	10.00% (14.96%)	28.75% (18.63%)	31.25% (22.76%)
Combined Mean		Combined Mean	
9.38% (13.50%)		30.00% (20.57%)	

the main effect of outcome persisted across response positions, both after outcomes and characters' neutral reactions to the outcomes.

Earlier we suggested that people's responses to the outcomes might be influenced by the characters' neutral responses. However, we found only tentative evidence suggesting that neutral reactions, in the case of some items and some categories of responses (i.e., emotional responses and positive appraisals), may have affected the contents of people's thoughts. In future experiments, we plan to address the role of reactions more closely by making characters' reactions either positive or negative in valence. For example, in the story about Lucy and Daryl, Lucy could say one of two different things to replace her neutral contemplation. Specifically, Lucy might respond positively by saying, "I will

always cherish you for this.” In contrast, Lucy might respond negatively by proclaiming, “I will always despise you for this.” These valenced reactions could potentially affect the extent to which people engage in convergent or divergent thinking.

## GENERAL DISCUSSION

We suggested that mysteries provide readers with opportunities to engage in creative thinking within the context of ongoing narrative experiences. We drew on the concept of expectation violations to write stories with contrasting outcomes. We called the outcomes “convergent” and “divergent” to foreshadow the types of creative thoughts we expected each to elicit. We predicted that these contrasting outcomes would prompt readers to engage in different types of thought.

In Experiment 1, we showed that people took longer to read divergent outcomes than convergent outcomes. We note that most, if not all, theories of text processing would predict the same difference in reading time. That is, readers often find it more difficult to process information that is inconsistent with prior narrative contexts (for a review, see Cook & O’Brien, 2014). People compare narrative information to the expectations encoded in their general world knowledge. If those expectations are violated, people most often slow down to comprehend the new information. We agree that our divergent outcomes were less expected than the convergent outcomes. However, rather than stopping with the reading time difference, this project addressed how people respond when narratives create mysteries. In particular, we argued that convergent outcomes prompted people to act more like convergent thinkers, whereas divergent outcomes prompted people to act more like divergent thinkers.

To support this claim, we conducted an experiment to expose the contents of people’s thoughts in response to the two types of outcomes. In Experiment 2, we used a speak-aloud paradigm to demonstrate that readers take up authors’ calls to participate in mysteries by thinking creatively. We expected convergent outcomes to yield products typical of convergent thinking and divergent outcomes to yield products typical of divergent thinking. We drew on previous literature on the features of convergent and divergent thinking to better understand the possible features of those products. The results suggested that convergent outcomes did lead people to respond using convergent thinking and divergent outcomes did lead people to respond using divergent thinking. Specifically, convergent outcomes prompted certainty, self-reflections, and positive appraisals, whereas divergent outcomes prompted uncertainty, more emotional responses, and more negative appraisals.

Our data support the claim that narrative mysteries provide readers with opportunities to engage in creative thinking. In the Introduction, we described

occasions on which readers might effortfully engage in either (or both) types of thinking. However, for our particular stories, we suspect that readers would not have needed to expend particular effort to assimilate the convergent outcomes. Rather, the convergent outcomes would accord with readers' background knowledge through ordinary memory processes (see Cook & O'Brien, 2014). In contrast, the thought processes set in motion by the divergent outcomes likely require strategic effort. In future research, we could imagine stories that could prompt readers to engage in effortful processing in convergent contexts. For example, imagine that just after Daryl presented the package, Lucy declared, "I know what's in the box!" Readers would have the opportunity to purposefully encode an inference, before they moved on with the story.

Our theoretical perspective also highlights the possibility that readers could have different responses to narratives as a product of individual differences in creativity. For example, van den Broek, Risdien, Fletcher, and Thurlow (1996) described processes of reading comprehension in which narrative coherence can either be achieved through direct retrieval from memory or, if information is not readily available, readers might expand the search for information or "suspend comprehension in anticipation that subsequent text will provide a resolution." The authors continued by asserting that, "Which of these two paths is taken depends on factors such as the reader's motivation, the available time, and so forth" (p. 167). Similarly, we suggest that some readers will fail to engage with mysteries (i.e., they will just read on), whereas others will carry out convergent or divergent thought processes (or both). Researchers have quite often demonstrated individual differences in both creative ability (for reviews, see Brophy, 2001; Ivcevic, 2009; Kaufman, 2011; Kaufman, Pumacchua, & Holt, 2013; Kühn et al., 2014; Simonton, 2014) as well as individual differences in *creative self-efficacy* (i.e., people's beliefs about their own creative abilities; see Tierney & Farmer, 2002). Experiment 2 demonstrated that, in general, convergent and divergent outcomes affected readers' thought processes. Against that general result, we speculate that readers' particular responses will be affected by their individual predilections with respect to creative cognition. Thus, two readers' narrative experiences could be quite different as a function of their creative responses to mysteries. Recall the example with which we began: Jamie and Myron's violation of a gravesite. Suppose Farrah fails to engage with the mystery (that is, she just reads on), whereas Dora pauses to carry out some divergent thought processes. At that moment, the two readers' representations of the narrative will already begin to part company. Downstream, when the novel reveals Jamie and Myron's intentions, Dora is likely to have a more vivid response—as a function of whether those intentions were within the range of possibilities yielded by her divergent thinking.

These speculations about individual differences in readers' responses relate to the *participatory perspective* on narrative experiences (Gerrig, 1993; Gerrig &

Jacovina, 2009; Gerrig & Wenzel, *in press*). A critical claim of the participatory perspective is that when immersed in stories, people respond as if they were experiencing the events in the real world. The responses people make to narratives are called *participatory responses*. For example, people might (mentally) yell at a character in the movie *Jaws* (Spielberg, 1975): “Don’t go in the water!” Bezdek, Foy, and Gerrig (2013) provided a taxonomy of participatory responses that arise as a function of readers’ emotional engagement. Our current project expands the participatory perspective by demonstrating circumstances in which participation engages creative processing. Again, our analysis suggests that readers’ cognition parallels their likely real-world response to the same events. That is, we would expect people’s real-world cognition to be equally disparate if they witnessed a woman receiving a ring or a gun in a romantic setting.

Let us note some limitations of this project. We would like to believe the results of Experiments 1 and 2 were related. That is, we believe that the creative mindsets that readers adopted after encountering convergent and divergent outcomes contributed to the reading time difference in Experiment 1. However, the speak-aloud task does not enable us to make direct comparisons with respect to timing. For that reason, we can only speculate that real-world readers would be more likely to pause, or would pause longer, when they encounter a divergent outcome. The results of Experiment 2 strongly suggest that, timing aside, the two types of outcomes lead readers’ thoughts in different directions.

We also acknowledge that by asking our participants to speak aloud, they may have engaged in more effortful processing than would be the norm. In this context, it would be instructive to collect additional data to determine the range of information that was accessible in readers’ representations after the outcome and reaction sentences.<sup>1</sup> For example, if readers engage in divergent thinking after the divergent outcomes, we might expect the range of possibilities they encode to supplant textual information in working memory. As such, they might respond more slowly in a probe-word paradigm that asked them to recognize words from earlier in the story.

We conclude by offering a second literary example of a mystery, from the novel *Lionel Asbo* (Amis, 2012, p. 109):

At 7:45 pm. Lionel had a few words with the girl at the desk, and extended his stay [at the South Central hotel] for another three weeks. In fact he wouldn’t be returning to the South Central—not for another 3 years.

We suggest that, when faced with this mystery, readers are likely to engage convergent thinking followed by divergent thinking. Lionel is a career criminal, so the 3 years likely represents a prison sentence (convergent thinking). However,

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<sup>1</sup>We thank an anonymous reviewer for this suggestion.

his past crimes have been relatively minor, resulting in brief stays in prison. What might he do that evening that would yield such a long sentence (divergent thinking)? Our project provides evidence to support the general perspective that readers often engage creative processes to enrich their own narrative experiences.

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## APPENDIX A: EXAMPLE EXPERIMENTAL STORIES

### Blaine Goes Surfing

Blaine was surfing off the coast of a Florida fishing town. He was alone out on the water, taking in the beautiful early morning sun. The sun's rays glistened like diamonds across

the great ocean expanse. Blaine watched a flock of seagulls swooping and diving about the water. In the distance, he saw the outline of a pier that was dotted with fisherman casting out their lines.

The wind started to pick up, and Blaine felt a surge of water underneath his board. He could sense that a set of waves was about to roll in. He floated up and over several steadily growing swells before spotting a perfect crest in the distance. Blaine turned toward the shore and lined up his board to ride the surge. He paddled hard and attacked the face of the wave that had been his mark. He caught it!

As he cruised atop the sick wave, Blaine noticed something just below the surface. He cut back, performed a graceful kick-out, dropped to his chest, and paddled back toward what he had seen.

As he approached, he noticed a long shadow underneath the water. The shadow appeared to be moving fluidly with the current. Blaine was very intrigued, because he had surfed those waters his entire life. However, Blaine also felt a little wary about getting too close. Just then, the waves parted long enough for him to get a good look.

*Convergent outcome:* Blaine had seen a shark.

*Divergent outcome:* Blaine had seen a bear.

He wondered what this meant for the ecosystem of his quaint fishing town (reaction sentence). Blaine was so distracted that he didn't see the next wave rolling in toward him. He ate it as the curl crashed over his back, sending his board flying. As he emerged from the water, Blaine heard the flock of seagulls squawking.

True–false comprehension questions:

1. Blaine was surfing in Hawaii.
2. Blaine caught the wave he wanted to ride.
3. Blaine was such a good surfer, he never wiped out.

## Ty and the BBQ

Ty left for his sister Barbara's house at 3 o'clock in the afternoon. Barbara and her husband were hosting a barbeque for family and friends. Ty was supposed to get there by 3, so he was running a little late. He rushed out and made a quick stop at the store for some beer. When he pulled up to Barbara's house, he grabbed the six-pack. He walked around the side of the house and through the metal gate into the backyard.

As soon as he entered the yard, Barbara's friend said, "Hey Ty, what's up with you these days?"

Ty responded, "Hi there, nothing much to report."

He made his way through several greetings before finding Barbara. When Ty approached her, she was talking to her husband near the corner of the yard.

Her husband said, "Hey Ty, come and check this out."

Ty agreed to play along, and the two men approached a white cooler. Ty could tell that his brother-in-law had brought him to see it for some reason.

Ty cracked open a beer and said, "Cool man, nice new cooler."

He wasn't too interested in hearing all about how great it was. Ty's brother-in-law lifted the lid to show him what was inside.

*Convergent outcome:* The cooler was filled with a dozen burgers.

*Divergent outcome:* The cooler was filled with a dozen diamonds.

Ty wondered why his brother-in-law was showing those to him (reaction sentence). Ty took a big swig of beer and waited a second longer to speak.

He said, "Wow, those look really high quality."

A dog ran under Ty's legs and almost knocked him down.

True–false comprehension questions:

1. Barbara's house had a metal gate.
2. Ty's brother-in-law showed him a red cooler.
3. A kid almost knocked Ty down.

## APPENDIX B: EXAMPLE FILLER STORIES

### Cheryl at the Party

Cheryl was at her friend Katie's going-away party. It was late August, and Katie had been accepted to her first-choice college in another state. Cheryl was having a great time, but she was a little sad to see Katie leave. She was also very proud of her friend for getting into such a prestigious university.

Everyone was living it up, trying to send Katie off in style. The men were jumping into the pool while trying to catch a Frisbee in midair. The women were dancing to some of their favorite tunes and saying their goodbyes.

Amidst all the fun, Cheryl went out to the front porch to call her mother, just to check in. And somehow, Cheryl managed to burn down a bush right next to the house.

When people saw the smoke, they all came running to see what had happened. After Cheryl's friends came around to the front of the house, they were amazed. Some of them started laughing and pointing at the charred ashes. Others looked on disapprovingly at the ridiculous spectacle Cheryl caused.

Katie's father had just planted the new bush and was very displeased. He had planted the bush in memory of his deceased mother who loved to garden. So, he swept up the remains of the bush and buried them in a brief but solemn ceremony. As soon as Katie's father did that, everyone knew that Cheryl's act had hurt him deeply.

All of Cheryl's friends wondered how she had burned down the special bush. The friends decided to get back to the party, but the spirit had changed. The men were no longer diving into the water, and the women danced distinctly slower. They whispered about how Cheryl might have done such a wholly dumb and careless thing.

### Rover Wants Out

Rover was a German shepherd and a fantastic watchdog for Donald's family. He had grown up alongside Donald's children and loved them dearly. He often slept outside their rooms at the top of the stairs. Rover wanted to protect the kids then greet them first thing in the morning.

One night around midnight, Rover started barking loudly as Donald's family slept. Rover ran down the stairs and toward the sliding door in the kitchen. The whole family woke up, and Donald ran downstairs to see what was the matter.

Rover kept barking and running in circles around the kitchen table. He wanted to get outside, so when he got next to the sliding door, he would stop for a second. Then, Rover would look up at Donald and start barking and running around again.

Donald thought to himself that Rover must have heard something dangerous outside. So, Donald slid open the door and let the dog run out into the darkness. Donald could hear Rover barking and growling intensely in the backyard. He heard a series of other noises that he couldn't identify. Donald really wanted to know what was happening out there, and tried to figure it out.

After Donald let Rover out of the house, Rover darted toward the far side of the yard. Donald flicked on the floodlight to try to see what was happening way out there. But the only thing Donald could see at that moment was Rover barking and snarling in the distance.