Revised: 16 March 2023

# **RESEARCH ARTICLE**

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# Spoiler alert: How narrative film captures attention

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#### Abstract

Narrative transportation is a state of total immersion that arises when one becomes engaged in a story. In Cohen et al. (2015), participants viewed a suspenseful film either with order of scenes intact or scrambled (out of chronological order). Participants had to remember to raise their hand every time they heard a film character say the word "gun." Results revealed participants were less likely to remember this instruction in the intact condition because their attention shifted away from processing their own goals to the goals of the protagonist. In three studies, we examined the boundary conditions of this effect by including a spoiler by telling participants the film ending (Study 1), having participants view the film individually or in groups (Study 2), and offering a reward incentive (Study 3). Overall, results showed that knowing the ending of the story did not improve performance, however, offering an incentive did boost goal maintenance. Implications of these findings are discussed.

#### KEYWORDS

attention, film, goal pursuit, narrative transportation

#### INTRODUCTION 1

The feeling of being transported by a gripping story is a familiar experience to most individuals. Everyone can relate to watching a thriller such as Stanley Kubrick's The Shining and feeling our blood pressure rise as an axe-wielding Jack closes in on his family. Narrative transportation was first coined by Gerrig (1993) to describe the phenomenon of being "transported" from one's current world of origin into the alternate world of a story narrative. Narrative transportation occurs when an individual becomes immersed in a narrative such that his or her attitudes and intentions change to reflect those of the story (Green et al., 2008; Van Laer et al., 2014). Some have depicted it as experiencing a state of simulation, leading to genuine feelings towards characters in the story, such as anger, joy or sadness (Mar & Oatley, 2008). According to Green and Brock (2000), the key psychological components are a combination of attention, imagery, and emotion. A similar idea that stems from literary and film theory is the notion of "suture theory" which Silverman (1983) describes as the

process by which the audience stitches themselves into a film narrative.

Research has shown that movies vary in how effectively they engage the viewer. As Shimamura et al. (2015) observed, when filmmakers are successful they are able to guide the viewers' attention to points in a scene. Films that are most engaging tend to trigger similar emotional and cognitive responses from viewers. That is, there are some films that are easier to stitch ourselves into. Hasson, Landesman, et al. (2008) had participants view various films while undergoing functional magnetic resonance imaging (fMRI). Inter-subject correlation (ISC) measures the degree to which brain activity is similar across viewers. Results of this study provided neuroscientific evidence that certain content (e.g., a film by Alfred Hitchcock "Bang! You're Dead," 1961) revealed especially high levels of inter-subject correlations compared to others (e.g., Larry David's Curb Your Enthusiasm, 2000).

In line with the Hasson, Landesman, et al. (2008) findings, Bezdek et al. (2015) provided neural evidence that suspenseful moments in a film narrative lead to a narrowing of attentional focus. While

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undergoing fMRI, participants viewed films presented at fixation, while flashing checkerboards appeared in the periphery. Results supported their hypothesis that in moments of increased threats to characters, there was a corresponding increase in activity to central visual regions and suppression of activity in peripheral visual regions.

In a study by Cohen et al. (2015), participants were given a simple goal to execute while simultaneously viewing the highly engaging Alfred Hitchcock (1961) film "Bang! You're Dead." While viewing the film, participants were given a simple goal. They were asked to remember to lift their hand every time they heard the word "gun" spoken by a character in the film. The word "gun" was spoken 7 times across the short film and participants were not reminded of these instructions once the film began. In one condition, the film was presented in its intended form with all the scenes in the chronological order. In the other condition, the individual scenes were intact but were presented out of chronological order. Results showed that participants were more likely to forget their goal to monitor for the word "gun" in the intact scene version relative to the scrambled scene condition. The authors concluded that participants were unable to resist being captured by the story when it was allowed to unfold in its intended form, thereby leading participants to neglect their own goals in order to take on the goals of the story protagonist.

There is support for Cohen et al.'s (2015) finding in the reading comprehension literature. For example, Trabasso and Suh (1993) show that goals yet to be accomplished by a story protagonist become more salient to the reader and are processed more quickly. In addition, Shah and Kruglanski (2002) demonstrated that the activation of an alternative goal may pull resources away from a previous focal goal thereby undermining goal attainment. Therefore, the more compelling the goal of a protagonist, then the more likely our own goals will be neglected.

In the Cohen et al. (2015) study, the instruction to remember to lift their hand every time they heard "gun" is akin to an "open goal" (Moss et al., 2007) or prospective memory (see Cohen & Hicks, 2017; Kliegel et al., 2007; Rummel & McDaniel, 2019 for reviews). In the prospective memory literature, participants are asked to maintain an intention such as remembering to press the computer key "/" every time they encounter an animal word, while performing a lexical decision task. An animal word may only appear 10 times in 200 trials so it is up to the participants to maintain this instruction in mind. Similarly, in the Cohen et al. (2015) task, remembering to raise their hand every time they heard the word "gun" had to be maintained across the duration of the entire film, with no reminders once the film began. Based on research by Smith and colleagues (Smith, 2003; Smith et al., 2007; Smith & Bayen, 2004), if we are to maintain a future goal for some proportion of time, processing resources need to be set aside to maintain that goal. Therefore, the instructions for a research participant to remember to lift their hand every time they hear the word "gun" is as a type of prospective memory instruction and so it serves as a sensitive measure of narrative transportation. If the film successfully engages our attention, then the world beyond the screen recedes along with the participant's memory for the experimental instructions.

# 1.1 | Current study

In three studies, we attempted to replicate and extend Cohen et al.'s (2015) findings by examining the boundary conditions of this effect. In Experiment 1, we explored whether telling the subjects the ending of the film (e.g., a spoiler) would make it easier for participants to avoid being captured by the suspense of the plot allowing them to maintain their goal. In Experiment 2, participants viewed the intact version of the film individually or in groups of 8–10 participants. We predicted that narrative engagement in the film might be disrupted by the presence of others. Finally, in Experiment 3, we offered a reward incentive in an effort to boost motivation to stay on task and avoid getting transported by the story narrative.

# 2 | EXPERIMENT 1

In Cohen et al. (2015), participants were less likely to remember their instruction because as they became immersed in the narrative, attention shifted away from processing their own goals to the goals of the protagonist. Bezdek et al. (2015) tested the hypothesis that, in moments when suspense increases, narrative transportation will produce a changing pattern of activity in brain regions involved in early visual processing. They showed that stimuli that were presented in the periphery received suppressed early visual processing when suspense increased in certain film scenes. Therefore, in this experiment we included a condition in which we gave participants a spoiler in which we told them the ending of the story. We hypothesized that knowing the ending would reduce the power of a suspenseful narrative thereby freeing up attentional resources to carry out their goal.

#### 3 | METHOD

#### 3.1 | Participants

A total of 83 undergraduate students from Yeshiva College, an allmale undergraduate institution in New York City, volunteered to participate in the experiment in exchange for course credit as a part of their psychology course or a nominal payment of \$5.00. Participants' ages ranged from 18 to 24 years old. Participants were randomly assigned to one of three conditions, yielding 28 participants in the intact scenes condition, 27 in the scrambled scenes condition, and 28 in the intact scenes + knowing the ending condition. One participant in the scrambled scenes condition was excluded for failure to follow the instructions. All participants were tested in sessions that lasted approximately 30 min.

#### 3.2 | Materials and procedure

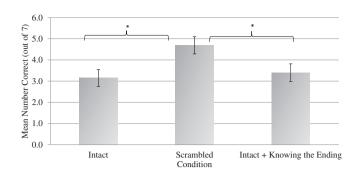
We used the film by Alfred Hitchcock titled "Bang! You're Dead!" (1961) that was shown to have high inter-subject correlations (Hasson, Landesman, et al., 2008) and that was used by Cohen et al. (2015). The synopsis of this film from IMDb (http://www.imdb.com/) is as follows "Rick Sheffield visits his brother and sister-in-law after a lengthy absence living in Africa. His nephew Jackie [who is 5 years old] unpacks his suitcase and finds a revolver. Jackie and his friends are always playing with their toy guns and Jackie goes around town, pointing the gun and pulling the trigger, oblivious to the fact that there is a live round in the chamber. When his parents and uncle realize he has the gun, they set off on a frantic search but not before he fires at someone" (Appendix A). The film could be broken down into 27 scenes. In the scrambled condition (described in more detail below and see Appendices B and C), we varied the temporal order of scenes by randomly shuffling the chronological scenes as done by Hasson, Landesman, et al. (2008) and Hasson, Yang, et al. (2008). Individual scenes were intact but were presented out of chronological order.

After signing the informed consent form, participants were instructed to read the instructions for the experiment, which were presented on the computer screen. Participants were given a cover story that we were interested in the amount of gun violence depicted in film. The exact instructions were as follows: "As you may be aware, there have been many shootings in the United States over the past few years and we are interested in the portrayal of violence in popular culture. In this task, you will be watching a short film and we will ask you questions at the end. One thing we want you to remember to do is raise your index finger in the air every time you hear the word 'gun' spoken at any point during the video. We will not be reminding you of this instruction once the videos begin. Once you have understood the directions, notify your experimenter."

Participants were randomly assigned to one of three conditions in which they viewed the film in its intended form (intact scenes condition), viewed the exact same content but with scenes presented out of chronological order (scrambled scenes condition), or viewed the intact scene version but they were given a spoiler in which they were told the ending of the story (intact + knowing the ending condition). In the scrambled scene condition, we disrupted temporal continuity by shuffling the scenes so that they were presented out of sequence. Each individual scene was intact but the order in which the scenes were presented was out of order. The intact version of the film could be separated into 27 separate scenes and some of the scenes were broken up into sub-scenes. The scrambled scene condition film comprised the same 27 scenes and sub-scenes, but they were rearranged and presented out of chronological order. See Appendix B for placement of cues in the intact version and Appendix C for the scrambled version. In all three conditions, participants were asked to remember to raise their dominant hand every time they heard the word "gun" spoken by a character in the film. Once participants showed comprehension, the film began with no further reminders of these instructions from the experimenter. In the intact + knowing the ending condition, the experimenter told participants before the film began: "So, we just wanted to let you know that this film is intense because everyone thinks that this little kid is going to shoot someone but in the end-NO ONE GETS HURT."

Therefore, participants in all three conditions viewed the identical film and had the same instruction to remember to raise their hand every

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**FIGURE 1** Mean number of correct responses to the word "gun" as a function of condition for Experiment 1. Bars represent standard error. Asterisks indicate significance (p < .05).

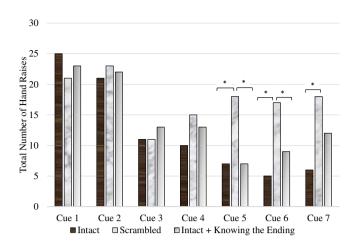
time they heard the word gun. At the end of the film, all participants demonstrated equivalent understanding of the story. Hand raises of participants were recorded discreetly by the experimenter who was seated out of view behind the participant. In all conditions, the word "gun" was spoken 7 times throughout the film at similar time points.

# 4 | RESULTS AND DISCUSSION

An alpha level of .05 was used in all analyses unless otherwise specified. We conducted a one-way analysis of variance (ANOVA) to compare the effect of condition (intact scenes, scrambled scenes, intact scenes + knowing the ending) on the number of times that participants remembered to respond to the cue "gun." Results revealed a significant effect of condition F(2, 80) = 4.55, p = .013,  $\eta_p^2 = .10$ . Pairwise comparisons showed that performance in the scrambled scene condition (M = 4.69 out of 7, SD = 1.95) was significantly higher (p = .008) compared to the intact scene condition (M = 3.15 out of 7, SD = 2.01) and significantly higher (p = .014) than performance in the intact + knowing the ending condition (M = 3.30 out of 7, SD = 2.18). There was no significant difference (p = .782) between performance in the intact scene and intact + knowing the ending condition. See Figure 1.

A post-hoc power analysis (G\* Power; Faul et al., 2009) with n = 83 participants and a medium to large effect size of f = .35 yielded power = .81.

We conducted three sets of binary logistic regressions at each of the seven time points. In the first set of analyses, we compared performance in the intact scenes condition to the scrambled scenes condition to check whether we replicated findings from Cohen et al. (2015). Results of the binary logistic regression revealed no significant differences at time points 1 through 4 (all *ps* > .135). However, there was a significant difference between performance in the intact and scrambled scenes conditions at cues 5 (p = .002), 6, (p = .001), and 7 (p = .001). Next we compared performance in the intact scenes condition to the intact scenes + knowing the ending condition at each of the seven time points. If knowing the ending of the narrative helped to decrease the degree that participants became immersed in the story, then we would detect better performance relative to the



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**FIGURE 2** Frequency of correctly responding to the word "gun" as a function of condition and appearance of cue for Experiment 1. Asterisks indicate significance (p < .05).

intact condition. The binary logistic regression revealed no significant differences at time points 1 through 7 (all ps > .117). Finally, we compared performance in the scrambled scenes condition to the intact scenes + knowing the ending condition at each of the seven time points. Results revealed there were no significant differences at time points 1 through 4 (all ps > .252). However, there was a significant difference between the scrambled versus intact + knowing the ending performance at time points 5 (p = .005) and 6, (p = .040) revealing that those in the scrambled scenes condition successfully remembered to respond to the word "gun" at time points 5 and 6 relative to those who watched the intact version of the film but knew the ending. This finding implies that those who watched the intact narrative and knew the ending still became caught up in the narrative and neglected to remember their goal relative to those who viewed the film with scenes that were out of chronological order. At time point 7, the difference between the scrambled versus intact + knowing the ending conditions did not reach significance (p = .092). Figure 2 shows the frequency of correct responses to the word "gun" as a function of condition and when they occurred in the film (cue 1 to cue 7).

Our results replicated those of Cohen et al. (2015) showing that participants were significantly less likely to remember to execute their goal in the chronologically intact scenes condition relative to the scrambled scenes condition starting at Cue 5 when suspense begins to build. Interestingly, and contrary to expectations, telling participants the ending of the story in the intact + knowing the ending condition did not lead to a corresponding benefit to remembering their goal to respond to "gun" for cues 5 and 6. Although, performance for those who knew the ending was slightly better at cue 7 possibly because it was clear that the story was coming to an end, which reminded them of the spoiler (that no one gets hurt).

In line with our findings, a handful of studies corroborate our finding that spoilers do not necessarily detract from the viewer's experience. Several studies show that spoilers can in fact improve enjoyment of film by facilitating processing fluency (Ellithorpe & Brookes, 2018; Leavitt & Christenfeld, 2011, 2013). A recent paper by Johnson et al. (2020) suggested that spoilers may play a specific role especially in the horror genre by creating heightened enjoyment through anticipation of a scare. They cite work by Carroll (1990) who suggested that even when we re-watch a narrative, we can feel the same thrill of the various twists and turns as when we viewed it for the first time. Perhaps this effect is especially true for films by masters such as Alfred Hitchcock who was especially successful at artfully engaging and controlling viewers' attention.

### 5 | EXPERIMENT 2

In the next study, we presented the same film from Experiment 1 either in a group setting or individually. We predicted that the presence of others might prevent participants from becoming as immersed in the film. To our knowledge, the effect of social variables on narrative transportation is an under investigated phenomenon which is surprising given the range of ways media is viewed (e.g., cinema theaters, laptop, and TV).

In one study, Dunand et al. (1984) had male subjects watch an aggressive or a neutral 6-min movie clip either alone, accompanied by a passive confederate (i.e., mere presence of a co-spectator), or an active one (i.e., reacting to the movie). Results showed that the violent film led to the greatest aggression and the presence of an active co-spectator increased aggressive behavior beyond what was observed alone or with the passive companion. In a more recent study, Kaltwasser et al. (2019) had participants view ten 2-min movie scenes with either 4 co-viewers or alone. Physiological measures that reflect emotional arousal were recorded such as galvanic skin response and heart rate and participants also self-reported their empathy, emotional intensity, and theory of mind (perspective taking). Results showed increased emotional arousal as depicted by physiological measures in the group viewing condition; however, participants showed no effect of group in their self-report measures. The authors concluded that the presence of few unfamiliar people behaving in a neutral attitude is not powerful enough to influence the participant's explicit viewing experience.

In contrast to these two studies, participants will view a complete 30-min film as opposed to film clips. In addition, we had a larger group of co-spectators (8–10) relative to the above studies. We hypothesized that awareness of other participants within the room might reduce the likelihood that participants would become as engaged by the story plot making it easier for them to focus on their goal. Participants were randomly assigned to view the intact version of the film individually or in groups of 8–10 participants. Participants in both conditions were instructed to report the number of times they heard the word "gun" spoken by a story character.

# 6 | METHOD

### 6.1 | Participants

A total of 74 undergraduate students (aged 18-24 years) from Yeshiva College, an all-male undergraduate institution in New York

City, volunteered to participate in the experiment in exchange for course credit as a part of their psychology course or a nominal payment of \$5.00. There were 39 participants in the group condition and 35 in the individual condition. All participants were tested in sessions that lasted approximately 30 min.

# 6.2 | Materials and procedures

We used the same film by Alfred Hitchcock titled "Bang! You're Dead!" as in the previous experiment. In addition, participants completed a narrative engagement scale (Busselle & Bilandzic, 2009) which measured four subscales with 3 times each for a total of 12 questions. The four scales were narrative understanding (e.g., *My understanding of the characters is unclear.*), attentional focus (e.g., *I found my mind wandering while the program was on*), emotional engagement (e.g., *The story affected me emotionally*), and narrative presence (e.g., *At times during the program, the story world was closer to me that the real world*). Responses were made on a 7-point scale from Strongly Disagree to Strongly Agree.

Participants assigned to the individual condition were seated in a small room in front of a single computer monitor. Participants in the group condition were seated around a long table and they watched the film together in groups of 8-10 participants, viewing it on a large screen that was positioned at the front of the room. After signing the informed consent form, all participants were asked to read the instructions for the experiment, which were presented on the screen. In the previous experiment, participants had to raise their hand every time they heard the word "gun" spoken by a character in the film and experimenters kept track of their performance. While this method was possible when testing participants individually, it could not work in the group condition because, if participants raised their hand, it would serve as a reminder to their co-attendees that "gun" was spoken. In fact, even pressing a computer key could have been seen by their co-participants. Therefore, in the current study, participants were instructed to keep a silent tally of the number of times they heard the word "gun" and then they self-reported this number at the end of the experiment. Participants were told that they could keep track using their fingers as long as they were subtle.

Participants in both groups were given a cover story that the researchers were interested in the amount of gun violence depicted in film, but instructions given to the different groups varied slightly. The written instructions for the individual condition were as follows: "As you may be aware, there have been many shootings in the United States over the past few years and we are interested in the portrayal of violence in popular culture. In this task, you will be watching a short film and we will ask you questions about it at the end. One thing we want you to do is to keep track of every time you hear the word 'GUN' spoken at any point during the video, and to try to keep track of the total number of times that you hear it. We will not be reminding you of this instruction once the video begins." Participants in the group condition received the same instructions and they were reminded not to speak or communicate with any other participant in the room.

### 7 | RESULTS AND DISCUSSION

An alpha level of .05 was used in all analyses unless otherwise specified. We conducted an independent samples *t*-test to compare memory for responding to the word "gun" in the individual and group conditions. Results did not reach significance t(66) = 1.94, p = .057, Cohen's d = 0.49. Participants in the group condition reported hearing the word "gun" at a numerically higher rate (M = 4.77 out of 7, SD = 1.79) compared to those in the individual condition (M = 4.03 out of 7, SD = 1.20). The sensitivity power analysis for Experiment 2 had power of .66 with a sample size of n = 74 and a medium effect size of d = .49 (G\* Power; Faul et al., 2009).

We conducted a 2 Condition (individual, group)  $\times$  4 Emotional engagement (narrative understanding, attentional focus, emotional engagement, narrative presence) mixed factorial analysis of variance (ANOVA) on self-reported narrative engagement. However, none of the four narrative transportation subtypes (e.g., narrative understanding, attentional focus, emotional engagement, and narrative presence) revealed any significant differences between conditions (all *ps* > .42).

We predicted that the presence of others in the group condition would suppress their narrative engagement in the film allowing them to focus on their goal to monitor for the word "gun." However, the comparison of performance in the group versus individual conditions failed to reach significance. In addition, there were no significant differences between conditions on the narrative transportation questionnaire implying that whether participants viewed the film individually or in a group, they experienced similar levels of narrative transportation. Kaltwasser et al. (2019) also failed to obtain an effect of group and concluded that it may be that the mere presence of other viewers may not be powerful enough to influence a participant's viewing experience.

An intriguing aspect of the data was that there were three subjects in the group condition who self-reported the word "gun" an amount of times that was actually higher (e.g., 8, 8, and 10) than the total number of times (7) that the word "gun" actually occurred during the film. In contrast to Experiment 1, we asked participants to keep a silent tally and then self-report at the end of the experiment the number of times they heard "gun" spoken. This led to the concern that self-reporting would lead to either under-reporting or over-reporting, a concern that we felt was minimal, given that it was the same for both conditions. However, the fact that three participants in the group condition reported more cues than actually appeared in the film is worth considering.

Research by Shteynberg (2015) shows that shared attention, or the perception of synchronous co-attention, can impact *intrapersonal* outcomes such as motivation. Based on this theory, participants have higher motivation when given a directive in a shared-attention context. It follows that if people felt higher motivation in the group condition, it may have led to an overestimation of their performance. In addition, this increase in motivation may have stemmed out of a desire to perform well in the presence of others (Wegge, 2000).

In the next study, participants viewed the film individually, as in Experiment 1. However, we introduced a new chronologically intact scene condition that included a reward incentive.

# 8 | EXPERIMENT 3

Recent research both behavioral (Murayama & Kitagami, 2014) and neuroscientific (Aberg et al., 2020; Düzel et al., 2010; Lisman & Grace, 2005; Shohamy & Adcock, 2010) provide evidence that anticipation of an external reward can promote memory. Murayama and Kitagami (2014) used an incidental recognition memory task to demonstrate the beneficial effects of a monetary reward on recognition memory. In the prospective memory literature, Cook et al. (2015) investigated the effects of monetary rewards and punishments as a way of manipulating the importance of a prospective memory task. They showed that the amount of correct responses increased when paired with a monetary reward.

In this study, we introduced a non-monetary reward incentive uniquely designed to be valuable to students (gaining credit for participation in the experiment for less work and time spent in the experimental session). We were interested in whether a non-monetary reward would lead to better prospective memory (remembering to respond to the word "gun").

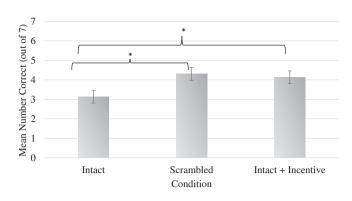
### 9 | METHOD

#### 9.1 | Participants

A total of 91 undergraduate students (aged 18–24 years) from Yeshiva College, an all-male undergraduate institution in New York City, volunteered to participate in the experiment in exchange for course credit as a part of their psychology course or a nominal payment of \$5.00. Participants were randomly assigned to one of three conditions, yielding 31 participants in the intact scenes condition, 30 in the scrambled scenes condition, and 30 in the intact scenes + incentive condition. All participants were tested in sessions that lasted approximately 30 min.

#### 9.2 | Materials and procedure

The materials and procedure were identical to Study 1 such that we included an intact scenes and scrambled scenes condition. However, in this experiment we introduced an intact + incentive condition in which participants viewed the film in its chronologically intact form but they were given a nonmonetary incentive. They were told: "If you do well on the first portion of the task, you will be allowed to leave the study early, while still receiving full credit." Based on informal polling of students, this incentive was considered to be highly motivating. As in Experiment 2, participants completed a narrative engagement scale (Busselle & Bilandzic, 2009; see Appendix D). There were four subscales: narrative understanding (e.g., *My understanding of the characters is unclear.*), attentional focus (e.g., *I found my mind wandering while the program was on*), emotional engagement (e.g., *At times during the program, the story world was closer to me that the real world*). Each



**FIGURE 3** Mean number of correct responses to the word "gun" as a function of condition for Experiment 3. Bars represent standard error. Asterisks indicate significance (p < .05).

of the subscales had 3 questions for a total of 12 questions. Responses were made on a 7-point scale from Strongly Disagree to Strongly Agree.

# 10 | RESULTS AND DISCUSSION

An alpha level of .05 was used in all analyses unless otherwise specified. We conducted a one-way analysis of variance (ANOVA) to compare the effect of condition (intact scenes, scrambled scenes, intact scenes + incentive) on the number of times that participants remembered to respond to the cue "gun." Results revealed a significant effect of condition *F*(2, 88) = 3.93, p = .023,  $\eta_p^2 = .08$ . Pairwise comparisons showed that performance in the intact scene condition (M = 3.13 out of 7, SD = 1.78) was significantly lower (p = .011) than performance in the scrambled scene condition (M = 4.30 out of 7, SD = 2.02) replicating Experiment 1 and Cohen et al. (2015). However, there was no significant difference (p = .716) between performance in the scrambled scenes condition and the intact + incentive condition (M = 4.13 out of 7, SD = 1.46) showing that giving participants an incentive elevated performance to the level observed in the scrambled scenes condition. There was also a significant difference (p = .029) between performance in the intact versus the intact + incentive condition revealing the benefit of a nonmonetary incentive to maintaining their goal (see Figure 3).

The post-hoc power analysis (G\* Power; Faul et al., 2009) with a sample size of n = 91 and a medium to large effect size f = .30 yielded power = .71.

Similar to Experiment 1, we conducted three sets of binary logistic regressions at each of the seven time points to investigate what differences between conditions existed at each of the 7 cues. See Figure 4. In the first set of analyses, we compared performance in the intact scenes condition to the scrambled scenes condition to check whether we replicated earlier findings from Cohen et al. (2015).

Results of the binary logistic regression revealed no significant differences at time points 1 through 4 (all *ps* > .097). However, there was a significant difference between performance in the intact and

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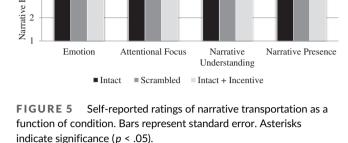
#### 35 30 **Fotal Number of Hand Raises** 25 \* 20 15 10 5 0 Cue 7 Cue 1 Cue 2 Cue 3 Cue 4 Cue 5 Cue 6 ■ Intact □ Scrambled □ Intact + Incentive

**FIGURE 4** Frequency of correctly responding to the word "gun" as a function of condition and appearance of cue for Experiment 3. Asterisks indicate significance (p < .05).

scrambled scenes conditions at cues 5 (p = .043), and 7 (p = .000). In contrast to Experiment 1, the difference between performance at cue 6 did not reach significance (p = .093). Next, we compared performance in the scrambled scenes condition to the intact + incentive condition at each of the seven time points. If giving participants an incentive helped them to stay on task and avoid getting immersed in the film, then we should observe little to no differences. The binary logistic regression revealed no significant differences at all 7 time points (all ps > .187) except for cue 3 (p = .029) where performance was higher in the intact + incentive condition and cue 5 (p = .012) where performance was lower relative to the scrambled scenes condition. It may be that the benefit of the incentive fluctuated across the duration of the film as shown by performance at cue 5. Finally, we compared performance in the intact scenes condition to the intact scenes + incentive condition at each of the seven time points. Results revealed there were no significant differences at time points 1 through 6 (all ps > .055). However, there was a significant difference at cue 7 (p = .002) revealing that those who received an incentive remembered significantly more times to execute their goal relative to those who watched the intact version of the film with no incentive. As depicted in Figure 4, performance in the intact + incentive condition was numerically higher relative to the intact condition on several time points, however, this difference only reached significance at cue 7.

Inspection of Figure 4 shows that the benefit of the reward incentive varied across the 7 cue time points. It may be that this variation reflects that as the film unfolded, attention alternated back forth between the narrative plot and the reward incentive.

We conducted a 3 Condition (intact scenes, scrambled scenes, intact scenes + incentive)  $\times$  4 Emotional engagement (narrative understanding, attentional focus, emotional engagement, narrative presence) mixed factorial analysis of variance (ANOVA) on self-reported narrative engagement. Overall, results revealed that participants were significantly more likely to remember to respond to the cue "gun" when a non-monetary reward incentive was linked to their performance. Results from the post-experiment questionnaire showed that participants in both the intact and intact + incentive condition showed significantly better narrative understanding relative to those



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in the scrambled scenes condition. Furthermore, those in the intact condition exhibited significantly higher levels of narrative presence in the story relative to the scrambled scenes condition. Most interestingly, for the level of attentional focus, participants in both the scrambled and the intact + incentive condition self-reported significantly lower attentional focus relative to those participants who viewed the intact scenes condition. See Figure 5.

This result implies that participants who had a reward incentive may have strategically disengaged from the film to better monitor their goal to remember to respond to the word "gun." This selfregulatory strategy is akin to how people while watching a movie may try to deliberately disengage from the most upsetting scenes by reminding themselves that "it's only a movie." Therefore, lowering attentional focus may have served as a type of self-regulatory strategy to help them better maintain the task instructions. This implies that, if sufficiently motivated, viewers can intentionally disengage attentional focus even when that narrative is very engaging.

# 11 | GENERAL DISCUSSION

Results from Experiment 1 and 3 replicated results from Cohen et al. (2015) showing that participants were significantly less likely to remember to execute their goal (to remember to respond to the word gun) while viewing an engaging film in its intended chronological order. We also demonstrated that including a spoiler did not boost goal adherence (Experiment 1), having participants view the film individually or in groups did not affect performance (Experiment 2), however, offering a reward incentive did improve maintenance of their goal (Experiment 3).

There is much anecdotal evidence that individuals think spoilers will compromise their experience of a narrative. In the short film "Bang! You're Dead" suspense builds slowly to a point that is uncomfortable. In Experiment 1, we included a condition with a spoiler in which we told participants the ending (e.g., "...everyone thinks that this little kid is going to shoot someone but in the end—NO ONE GETS HURT"). We predicted that knowing the outcome would <sup>8</sup> \_\_\_\_WILEY\_

alleviate the discomfort associated with knowing that something terrible is about to befall story characters thereby freeing up cognitive resources to focus on their goal of monitoring for instances of the word "gun." Contrary to our expectations, results showed that including a spoiler did not improve performance. Given that participants were given the spoiler at the beginning of the experiment well in advance of viewing the film, it might have lost its potency. In line with this reasoning, Topolinksi (2014) found that when there was a shorter delay in the time between presentation of a spoiler and exposure to the narrative, the more the spoiler tended to decrease enjoyment. Furthermore, in research by Yan and Tsang (2016), they showed that when spoilers focused on the outcome of a story, it did not impact enjoyment. Experiment 4 of their paper showed that although participants overestimate the negative impact of knowing the outcome, it does not have an impact. Johnson et al. (2020) examined the effect of spoilers in the horror genre and suggest that expectation of a fright or plot twist may heighten enjoyment especially for those high in the trait of "need for affect." So, even though participants in our study knew that, ultimately, no one would be hurt, they may have still been unable to resist attending the suspenseful events as they unfolded. It may be that films in the horror and suspense genre create a type of momentum that increases as suspense builds.

It is important to note that although we refer to the spoiler in Experiment 1 as a way to reduce suspense, we did not actually measure levels of suspense. Therefore, we cannot say that knowing the ending of the film had any effect on perceived suspense. According to transportation theory, as the story unfolds we identify with story characters and start to simulate their thoughts and emotions. Therefore, even if we know the ending of the story, it does not stop us from simulating and "feeling" the parent's panic as they frantically search for their missing son. It is plausible that suspense is linked in some way with empathy for story characters and the emotions that they are feeling.<sup>1</sup>

In Experiment 2, we failed to observe a significant difference between performance in the individual and group conditions. Although we are hesitant to interpret a null effect, given that Kaltwasser et al. (2019) also failed to obtain an effect of group on their explicit measures of viewing experience, it may be a true null effect. Kaltwasser concluded based on their findings that it may be that the presence of other viewers behaving in a neutral attitude is not powerful enough to influence another participant's subjective viewing experience. An interesting future study would be to include confederates in the group condition who would react emotionally to the film, then there might have been a type of social contagion effect similar to the one observed in Dunand et al. (1984) in which an aggressive coviewer led to aggression in other viewers.

As mentioned previously, in Experiment 2 we asked participants to keep a silent tally and then self-report at the end of the experiment the number of times they heard "gun" spoken. We understood that this raised the potential that self-reporting would lead to either under-reporting or over-reporting. It is of note that subjects did not know the specific total number of times that "gun" was spoken. Hence, the combination of being able to silently keep a tally,

combined with the motivation to perform well in a group context, could have inflated self-reports. Research shows that there is an overall tendency for overestimation when self-reporting (e.g., Keysar & Henly, 2002; Mayer et al., 2007). Therefore, it may be that this tendency was operating in both conditions given that mean performance in the individual condition was higher (M = 4.03) than the identical, matching condition in Experiment 1 (M = 3.15) in the current study; and, also, compared to performance in the Cohen et al. (2015) study (M = 3.40).

When events in the plot are sequenced in a dynamic and engaging way, it makes disengaging (to remember one's goal) more difficult relative to narratives in other genres. Indeed, important work by Bezdek and colleagues shows that attention narrows as suspense is heightened. In the Hitchcock film, the protagonist, five-year-old Jackie, walks around town with his uncle's loaded gun pointing it at people, thinking it is a toy. As his parents set off on a frantic search to find him, the viewer witnesses the parents' panic and we feel a corresponding feeling of dread and foreboding. Bezdek et al. (2015) suggested that suspense is one of the key factors linked to increased transportation and it arises when potential threats to characters become salient. Thus, in the intact scenes condition, identification with story characters was built in a gradual and natural way leading to a corresponding increase in concern and empathy when those characters were threatened.

In Experiment 3, participants were given an incentive and they were able to successfully disengage from the suspenseful narrative to continue to monitor and execute the task instructions to remember to respond to the cue "gun." The fact that the incentive improved performance in this study shows that participants can intentionally override the effects of narrative transportation. Based on results from the post-experiment narrative transportation questionnaire, participants who were incentivized self-reported significantly lower attentional focus relative to those in the intact scenes condition without an incentive. This result implies that participants may have intentionally disengaged periodically to remind themselves of the incentive as a way to boost performance.

Recent findings by Aberg et al. (2020) provides neuroscientific evidence that rewards activate the mesolimbic reward system, which increases phasic dopamine release in the hippocampus, leading to better memory consolidation. Aberg and colleagues describe this process as a dialog between two brain areas that leads to motivation. Therefore, the incentive may have motivated participants to adopt a strategy that helped them avoid becoming immersed in the film. As a result, it allowed them to maintain their goal more successfully relative to those in the intact condition who had no such incentive.

It is important to note that this study has limitations. We used a convenience sample of all male undergraduates who may not be representative of all moviegoers. We chose to use one film across the three experiments in the interest of consistency and to replicate and extend the findings of Cohen et al. (2015). However, the generalizability of these effects to other films will need to be examined in future studies. Another obvious limitation is that in Experiment 2, we are reporting a null result. We acknowledge that a null result does not

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Despite these limitations, the current study advances previous research by showing how competing motives (viewing a narrative and maintaining one's goal) involve a type of tension. As attention is captured by the film and a state of narrative transportation develops, we lose subjectivity and the focus on our own goals is replaced by focus on the goals of the protagonists portrayed in the film. This competing tension persists even when we know the ending of a film (Study 1) and it is not affected by the number of film co-viewers present within the room (Study 2). However, if one is sufficiently motivated by an incentive (Study 3), then we can disengage by withdrawing attentional focus from the film in order to re-direct attention towards personal goals.

Many of us use our smartphones in the workplace to respond to emails and communicate with colleagues. Within the context of our increasingly complicated digital world where we flit between watching engaging videos on social media while attempting to maintain productivity, further investigation is essential to further our understanding of the intersection of narrative transportation and maintaining goals.

#### CONFLICT OF INTEREST STATEMENT

All authors declare that they have no conflicts of interest.

#### DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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#### ENDNOTE

<sup>1</sup> We thank Reviewer 1 for suggesting this alternative interpretation.

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How to cite this article: Cohen, A.-L., Goldberg, C., Mintz, J., & Shavalian, E. (2023). Spoiler alert: How narrative film captures attention. *Applied Cognitive Psychology*, 1–12. <u>https://doi.org/10.1002/acp.4070</u>

#### APPENDIX A

Scene 1: Intro, children are playing with toy guns in front yard of Jackie's house

Scene 2: Dad and uncle pull up in car and mother comes out to greet them

Scene 3: Family in living room chatting

Scene 4: Father and mother in living room

Scene 5: Uncle begins unpacking his suitcase with Jackie in upstairs bedroom

Scene 6: Jackie's father comes upstairs and asks uncle to come downstairs

Scene 7: Jackie continues unpacking for uncle and discovers real gun and puts it in his pocket

Scene 8: Family is in living room/mother is on phone/ Jackie leaves the house

Scene 9: Jackie pretends to "hold up" mailman with gun then continues walking through town

Scene 10: Uncle realizes that his gun is missing and that Jackie has taken it

Scene 11: Jackie walks to supermarket and amuses himself playing with the gun

Scene 12: Mother is back at home calling friends trying to find her son Scene 13: Uncle asks neighborhood kids if they have seen Jackie

Scene 14: Jackie is at store riding on coin operated horse ride Scene 15: Jackie walks into the supermarket

Scene 16: Mother walks in the store frantic but she cannot find him

Scene 17: Store is very busy and everyone ignores the mother

Scene 18: Mother continues looking around in store for her son

Scene 19: Manager makes announcement on intercom that Jackie should report to the office

Scene 20: Jackie runs out of the store and does not hear the announcement

Scene 21: Sales lady says that she saw her son a few minutes ago Scene 22: Mother grabs intercom speaker and makes frantic announcement

Scene 23: Mother, father, uncle are in parking lot searching for Jackie

Scene 24: Jackie walks home oblivious to the fact that everyone is looking for him

Scene 25: Jackie interacts with housekeeper Cleo who has just arrived

Scene 26: Family pulls up to the house

Scene 27: Jackie fires shot at Cleo just as the family rushes into the house

#### APPENDIX B

Scene 1.1 Scene 1.2 Scene 1.3 (Cue 1) Scene 2.1 Scene 2.2 Scene 2.3 Scene 2.4 Scene 2.5 Scene 2.6 Scene 2.7 Scene 2.7 Scene 2.8 Scene 3.1 (Cue 2) Scene 3.2 Scene 3.3 Scene 3.4

Scene 3.5	
Scene 3.6	
Scene 4	
Scene 5	
Scene 6	
Scene 7.1	
Scene 7.2	
Scene 7.3	
Scene 7.4	
Scene 7.5	
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Scene 7.10	
Scene 7.11	
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Scene 7.14	
Scene 7.15	
Scene 7.16	
Scene 8.1	
Scene 8.2	
Scene 8.3	
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Scene 9.2	
Scene 9.3	
Scene 9.4	
Scene 10.1	
Scene 10.2	
Scene 10.3	
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Scene 10.5	
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Scene 10.7	
Scene 10.8	
Scene 10.9	
Scene 10.10	
Scene 10.11	
Scene 11	
Scene 12.1	
Scene 12.2	
Scene 12.3	
Scene 12.4	
Scene 13.1	
Scene 13.2 (Cue 3)	
Scene 13.3 (Cue 4)	
Scene 13.4	
Scene 14.1	
Scene 14.2	
Scene 14.3	
Scene 14.4	
Scene 14.5	

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Scene 14.6
Scene 14.7
Scene 14.8
Scene 14.9
Scene 15
Scene 16.1
Scene 16.2
Scene 16.3
Scene 17.1
Scene 17.2
Scene 18.1
Scene 18.2
Scene 18.3
Scene 18.4
Scene 19.1
Scene 19.2
Scene 20
Scene 21.1
Scene 21.2
Scene 21.3 (Cue 5)
Scene 22.1
Scene 22.2
Scene 22.3
Scene 23
Scene 24
Scene 25.1
Scene 25.2
Scene 25.3
Scene 25.4 (Cue 6)
Scene 26
Scene 27 (Cue 7)

# APPENDIX C

Scene 2.8 Scene 2.6 Scene 14.9 Scene 2.7 Scene 22.2 Scene 25.4 (Cue 1 [actual cue 6]) Scene 7.15 Scene 5.1 Scene 7.16 Scene 10.11 Scene 16.3 Scene 9.4 Scene 10.10 Scene 7.1 Scene 11.1 Scene 21.1 Scene 10.1 Scene 18.3

Scene 12.1 Scene 18.1 Scene 14.4 Scene 3.1 (Cue 2 [actual cue 2]) Scene 2.1 Scene 7.9 Scene 12.3 Scene 14.1 Scene 2.3 Scene 9.3 Scene 7.7 Scene 8.2 Scene 14.2 Scene 3.2 Scene 16.2 Scene 7.8 Scene 16.1 Scene 2.2 Scene 9.1 Scene 10.5 Scene 7.5 Scene 20.1 Scene 7.3 Scene 14.3 Scene 3.4 Scene 14.5 Scene 10.4 Scene 3.3 Scene 10.6 Scene 7.12 Scene 19.2 Scene 14.6 Scene 14.7 Scene 3.6 Scene 3.5 Scene 10.9 Scene 17.2 Scene 4.1 Scene 25.1 Scene 7.10

Scene 7.4

Scene 21.3 (Cue 3 [actual cue 5]) Scene 17.1 Scene 7.13 Scene 9.2 Scene 2.5 Scene 26.1 Scene 1.2 (Cue 4 [actual cue 1]) Scene 10.2 Scene 1.3 Scene 7.14 Scene 18.4 Scene 1.1 Scene 2.4 Scene 8.1 Scene 8.3 Scene 14.8 Scene 19.1 Scene 22.1 Scene 10.3 Scene 13.1 Scene 24.1 Scene 12.4 Scene 7.6 Scene 13.3 (Cue 5 [actual cue 4]) Scene 10.7 Scene 25.2 Scene 12.2 Scene 25.3 Scene 15.1 Scene 10.8 Scene 18.2 Scene 6.1 Scene 13.4 Scene 23.1 Scene 27.1 (Cue 6 [actual cue 7]) Scene 22.3 Scene 7.2 Scene 21.2 Scene 13.2 (Cue 7 [actual cue 3]) Scene 7.11