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The Delay Hypothesis: The Manifestation of Media Effects Over Time

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*A between-participants experiment (*N *= 147) tested for the presence of a delayed effect following exposure to an episode of a legal drama that contained false information. Participants were more likely to endorse false beliefs if they were queried two weeks after watching the program rather than immediately following exposure. The relationship between time and false belief endorsement was found to be moderated by perceived reality of the program. Consistent with the delay hypothesis, those who perceived the legal drama to be unrealistic following exposure had significantly higher false belief scores at Time 2.*

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Mass communication scholars have recently voiced concern about the trajectory of media effects research (Nabi, 2008; Potter, 2009). Media effects research has often relied on fictional narratives as stimuli (see Zillmann, 2002), and the majority of these studies have examined immediate attitude/belief change following exposure to a single stimuli. When these designs produce small effects, and they routinely do, researchers typically argue that small effects are meaningful when cumulative (e.g., the drip hypothesis; see Gerbner, Gross, Morgan, Signorielli, & Shanahan, 2002). Others have argued that even though media effects are typically small, there exist singular instances that can have a large impact on attitudes and beliefs (i.e., the drench hypothesis; see Greenberg, 1988). Both approaches have helped to drive research and explicate findings, but media effects research would benefit from innovative hypotheses that elucidate new questions and designs.

The current study introduces a third possibility: the delay hypothesis. According to the delay hypothesis, media effects can manifest over time as a byproduct of information retrieval, storage, and processing. For example, fictional media narratives may produce small or no immediate effects on receiver beliefs that then increase or manifest over time as components of the message decay, become dissociated in memory, and/or are reappropriated in alternative ways by cognitive networks (Wyer & Srull, 1989). In other words, the full impact of fictional narratives may be felt over time as bits and fragments of the message are disconnected and then activated

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out of their original context. Narrative content with vivid imagery would be more prone to these effects (Shrum, 2009) as would fictional exemplars (Zillmann, 2002). Vivid imagery/content and exemplars are both more accessible in the mind, and therefore highly vulnerable to accessibility effects that would necessarily manifest over time (Shrum, 2009). Alternatively, delayed effects could be a byproduct of receivers needing more time to digest or process implicit, complex, or emotionally charged information in narratives. Indeed, the notion that humans can immediately digest all information and form coherent attitudes and beliefs (seconds or minutes after exposure) may be inconsistent with routine information processing needs (see, e.g., Walker & van der Helm, 2009). Moreover, the delay hypothesis is not mutually exclusive from other media effects hypotheses; one could imagine both a delayed drip (i.e., a delayed cumulative effect) and a delayed drench (i.e., a delayed large effect). The basic principle is that many media effects may be connected to information retrieval, storage, and processing, as social cognition research would suggest (Roskos-Ewoldsen & Monahan, 2007; Shrum, 2009), rather than a simple linear or immediate effect.

Viewed in this way, the delay hypothesis postulates that many effects will occur well after initial exposure to fictional narratives, especially those with vivid content and imagery. Preliminary support for this hypothesis can be found in narrative research that has revealed sleeper effects. A sleeper effect occurs when the persuasive impact of a message increases or manifests over time (Hovland, Lumsdaine, & Sheffield, 1949). Sleeper effects have been described as counterintuitive (Kumkale & Albarracin, 2004), namely, because both motivation and memory would seem to favor a negative relationship between persuasive effect and time (Eagly & Chaiken, 1993). Indeed, in most communication situations a sleeper effect may be the exception rather than the norm.

One limitation of past work, however, is that researchers have traditionally utilized expository message stimuli to test for sleeper effects. Expository messages include speeches and arguments (Schank & Berman, 2002). More recently, several studies have tested for sleeper effects following exposure to narrative communication (Appel & Richter, 2007; Nabi, Moyer-Gusé, & Byrne, 2007). Narratives are messages with ''connected events and characters'' that are ''bounded in space and time'' (Kreuter et al., 2007, p. 222). In narrative situations, receivers may focus on the plot or story rather than the implicit or explicit arguments in the message (Busselle & Bilandzic, 2008; Green & Brock, 2000; Slater & Rouner, 2002). As a result, some have argued that narrative communication could ''short-circuit'' critical message processing and thereby produce persuasive effects equal to or even different from expository messages (Nabi et al., 2007). Thus, even though sleeper effects appear to be conditional and rare in expository situations, there are good reasons to believe that similar phenomena may function very differently in narrative situations. Accordingly, the delay hypothesis builds on past sleeper effect research, but also changes the scope of inquiry from persuasive communication to mass media while expanding the number of avenues by which delay effects might occur. The latter is essential as media effects research

has identified delayed effects that fall outside the scope of traditional sleeper effect scholarship, but might be consolidated under a larger theoretical umbrella (see, e.g., Moyer-Gusé & Nabi, 2010).

The present study tests the delay hypothesis by examining whether exposure to false information in a televised fictional narrative is more persuasive over time. Televised fictional narratives may be especially vulnerable to such effects as they provide images and sounds that can be stored and utilized by the brain in a multitude of ways. Shrum (2009) took this idea a step further, arguing that dramatized fiction was often more vivid than real life and therefore well positioned to distort memory. As tertiary support for this idea, research has shown that individuals exposed to vivid imagery from televised autopsy scenes conjure up those same images (i.e., reappropriation of visual content) when making unrelated organ donation decisions (Bresnahan, Smith, & Kim, 2007). In addition to examining televised fictional narratives, the present study tests several potential moderators of the effect that could be central to narrative processing, including perceived reality, character identification, and narrative transportation (Busselle & Bilandzic, 2008).

Sleeper effects

Research on the sleeper effect has typically examined overtly persuasive expository communication, but the knowledge garnered from this work still serves to inform the current study. Initially, it is important to distinguish between absolute and relative sleeper effects. A relative sleeper effect occurs when there is a loss of differential effects from source cues over time, but without any delayed increase in persuasion. For example, the positive influence of a high-credibility speaker dissipates over time so that there is no longer a difference between a high-credibility and low-credibility communicator (Pratkanis, Greenwald, Leippe, & Baumgardner, 1988). An absolute sleeper effect, the effect of interest in the present study, occurs when there is a significant increase in persuasion from Time 1 to Time 2 for the discounting cue condition, but not the control condition (Cook, Gruder, Hennigan, & Flay, 1979). For the purpose of brevity, the term sleeper effect in this article will refer to an absolute sleeper effect.

The first study to document a sleeper effect was conducted during World War II (Hovland, Lumsdaine, & Sheffield, 1949). Contrary to expectations, Hovland and colleagues found that the persuasive effect of propaganda films on American soldiers increased over time. The soldiers initially discounted the information in the film because they questioned the credibility of the source; however, several weeks after exposure soldiers were significantly more likely to endorse the information in the film. Hovland and colleagues reasoned that this was a byproduct of the soldiers forgetting the source over time. Thus, the earliest sleeper effect study examined the impact of a propaganda film, although the content was expository rather than narrative in structure.

Hovland et al.'s (1949) study initiated a wave of research on the sleeper effect. The standard design was to expose two groups to a message and provide one group with a

discounting cue (e.g., a reason to question the credibility of the source) and the other with either an acceptance cue (e.g., a reason to trust the credibility of the source) or no cue at all (Cook & Flay, 1978; Hovland & Weiss, 1951). Additional research on the sleeper effect suggested that the forgetting hypothesis was invalid as most people seemed to recall the source and the message weeks after exposure (Hovland & Weiss, 1951). As a result, Hovland and colleagues postulated that the sleeper effect must materialize as the discounting cue and the message content become disassociated over time. Both are remembered, but they are no longer connected in the mind.

Unfortunately, subsequent sleeper effect research often failed to produce an effect (e.g., Gillig & Greenwald, 1974; Hennigan et al., 1982), a situation that led some researchers to question whether any such effect existed (Capon & Hulbert, 1973). Sleeper effect research was revitalized by a series of studies that argued and validated four conditions that had to be met in order to observe the effect (Cook, Gruder, Hennigan, & Flay, 1979; Gruder et al., 1978). Cook et al. (1979) argued that a sleeper effect only materialized in situations where the following were true: (a) the persuasive message had an immediate impact on the receiver, (b) the discounting cue was strong enough to offset the impact of the message, (c) there was sufficient time between measurements for the discounting cue and the message to become dissociated, and (d) dissociation preceded forgetting of both the source and the message. According to the authors, discrepancy in the research literature was simply a byproduct of studies failing to meet one of these conditions.

Pratkanis, Greenwald, Leippe, and Baumgardner (1988) offered an alternative hypothesis. They argued that the sleeper effect materialized because memory of the source information decayed at a faster rate than memory of the message content (i.e., differential decay). Importantly, their work suggested that the discounting had to be revealed after the message as past research suggested that more recent information decays at a faster rate.

A meta-analysis of the sleeper effect literature generally supported dissociation as well as the notion that position of the discounting cue was central to the effect (Kumkale & Albarracin, 2004). The meta-analysis synthesized 24 research reports (which contained 72 independent studies) and found a small, but statistically significant sleeper effect for individuals in the discounting cue condition (Cohen's $d = .08$; 95% CI: 0.03–0.13). The size of the effect hinged on the initial impact of the message and the discounting cue, as well as the ability and motivation of the message recipient. Concerning the latter, the sleeper effect was larger for individuals with prior knowledge of the message topic and for those who perceived the topic to be relevant.

Narrative communication and sleeper effects

A recent development in the literature is the search for sleeper effects following exposure to written fictional narratives (Appel & Richter, 2007) and entertainment messages (Nabi et al., 2007). Nabi et al. (2007) argued that narrative communication is different than expository communication in that the former focuses receiver attention on the plot or story rather than the argument being made. By focusing

attention on plot, narratives could diffuse counterarguing or otherwise make receivers more susceptible to implicit or explicit arguments in the message (Green & Brock, 2000; Slater & Rouner, 2002).

The present study is specifically interested in the persuasive impact of fictional narratives. Fictional narratives are contrived, although they may model the real world to varying degrees. In fact, how receivers will process a given fictional narrative is difficult to predict (Potter, 1988). That said, there is always a reason to discount any piece of information from a fictional narrative (i.e., because it is fiction). There is also reason to believe that fictional narratives are ideally suited to produce sleeper effects. Past research has suggested that consumers of fiction dissociate source and content over time (Marsh, Meade, & Roediger, 2003). In addition, humans may find it easier to recall story-based information, as that may be the underlying framework guiding memory (Schank & Abelson, 1995; Schank & Berman, 2002). Early work on narrative processing speculated that receivers needed to suspend disbelief to follow fictional plotlines, but subsequent research has demonstrated that belief may be the default message processing state (Gerrig & Rapp, 2004; Gilbert, 1991; Prentice & Gerrig, 1999). Consistent with this idea, the model of narrative comprehension and enjoyment (MNCE) postulates that "only deviations from the actual world that are not incorporated into a specific story world logic should provoke counterarguing" by audiences (Busselle & Bilandzic, 2008, p. 273). In other words, receivers tend to initially accept fiction and nonfiction stories as realistic and only discount unreal aspects of the message, during processing, that are not consistent with the logic of the fictional story. Finally, fictional narratives may provide people with experiences and images that are more vivid than ordinary life and that are easier to recall (Shrum, 2009). On a similar note, Zillmann (2002) argued that vivid examples (even when false) may serve as exemplars in the mind of larger patterns and trends. All of which suggests that information in fictional narratives could be processed, stored, and retrieved in ways that facilitate sleeper effects.

To test whether fictional narratives could produce a sleeper effect, Appel and Richter (2007) had 81 college students read one of the two versions of a fictional narrative (*The Kidnapping*) that contained false information or a control story. Participants then responded to a series of questions assessing their endorsement of false beliefs contained in *The Kidnapping*. Half the participants answered the false belief questions immediately after reading one of the stories and the other half answered the questions two weeks later. They found a small, but statistically significant sleeper effect (interaction effect size: $\eta^2 = 0.08$; difference between control and treatment at Time 2: $\eta^2 = 0.28$). Using the control condition to calculate difference scores, the researchers found that participants exposed to *The Kidnapping* were more likely to endorse false belief statements after a two-week delay.

The delay hypothesis

The present study extends research on narrative communication and the sleeper effect by situating the work within a larger framework: the delay hypothesis. Similar to

sleeper effect research, the delay hypothesis posits that the impact of media messages will increase or manifest over time as a result of information retrieval, storage, and processing. However, the delay hypothesis deviates from sleeper effect research by postulating that delayed effects can also manifest through other means, including reappropriation of message content by the cognitive network, memory retrieval errors, errors in source monitoring, or inefficient storage of message content in long-term memory (Shrum, 1997). Consistent with this idea, Kumkale and Albarracin (2004) argued that researchers need to pay more attention to the storage process underlying delayed effects. They proposed that such effects could be explained by the associative network model of memory (Wyer & Srull, 1989), which posits that information is stored according to headers, and individual nodes of memory are connected by a complex network of associations. These associations could be activated later (often out of their original context) whenever an aspect of the network was triggered. For example, a question about organ donation could trigger the ''organs'' node, which could then trigger imagery of a fictional autopsy scene previously viewed on television (Bresnahan, Smith, & Kim, 2007). This reappropriated negative image could then serve to decrease organ donation intentions consistent with the delay hypothesis.

There are several reasons to situate sleeper effect research within a larger framework. First, research on the sleeper effect has identified an increasingly conditional relationship (Cook et al., 1979), a situation that could be symptomatic of an overly narrow theoretical platform. To combat problems of this nature, Potter (2009) advocated that mass communication researchers should strive to translate isolated effects into larger frameworks that might govern communication phenomena in general. Research in social cognition alone suggests that there are many plausible routes that could produce delayed message effects (e.g., reappropriation, inefficient storage in memory). On a similar note, models such as the MNCE, the limited capacity model (Yegiyan & Lang, 2009), and the entertainment overcoming resistance model (Moyer-Gusé, 2008) may help to elucidate a family of delayed effects that could be housed beneath the delay hypothesis. Put differently, the pursuit of an ever nuanced explanation for sleeper effects has in some ways obscured the lack of research examining delayed message effects more generally.

Second, expository messages have often been analyzed using models grounded in rational decision making. True to form, past sleeper effect research in expository situations assumed that processors were rational and thus only susceptible to delayed effects as a result of some cognitive error or decay (Kumkale & Albarracin, 2004). On the other hand, scholarship in narrative communication has examined both rational and nonrational aspects of information processing such as the formation of deep interpersonal bonds with fictional characters (Cohen, 2001; Greenwood & Long, 2009). This research suggests that delayed effects could manifest as constructs related to narrative processing (e.g., character identification, narrative transportation) develop or as receivers process intense or emotionally powerful material. For example, Moyer-Gusé and Nabi (2010) found that greater identification with characters in a dramatic

fictional narrative about unplanned pregnancy decreased counterarguing and, two weeks later, increased perceived vulnerability. The delay hypothesis postulates that delayed effects can be a byproduct of retrieval and storage errors as well as extended information processing. Indeed, at least some previously observed small or null media effects could be a reflection of experimental researchers giving participants insufficient time to digest complex narrative information. Complete processing and consolidation of emotional content, for instance, may require sleep (Walter & van der Hemp, 2009).

As a preliminary test of the delay hypothesis, the present study examines whether televised fictional narratives can be more persuasive over time. Unlike written fiction, televised fiction contains moving imagery and dramatic sound; elements that could provide additional opportunities for vivid content capable of shaping long-term attitudes and beliefs (Shrum, 2009). Technically, all information in a fictional narrative could shape attitudes and beliefs, but the present study is especially interested in the processing, storage, and retrieval of inaccurate or false information (i.e., violations of external reality; see Busselle & Bilandzic, 2008). Accurate information in a fictional story could be influential for a variety of reasons; for example, accurate content could be persuasive because it is consistent with personal experience. Inaccurate information, however, provides a useful way to study media effects caused by message storage and retrieval. Thus, it is hypothesized that individuals exposed to televised fictional narratives containing false information will be more likely to endorse relevant false beliefs over time.

H1: For those exposed to a television show depicting a false belief, false belief endorsement will be greater for individuals queried two weeks after exposure (Time 2) than for individuals surveyed immediately after viewing the program (Time 1).

Moderators

Appel and Richter (2007) tested one moderator (need for cognition) and it was found to be unrelated to their delayed effect. However, Kumkale and Albarracin's (2004) meta-analysis demonstrated that indirect relationships (e.g., motivation, ability, impact of the message) seemed to explain a good deal of the inconsistency in past research. The present study extends their research by examining the impact of a source reminder as well as several cognitive moderator variables that past research suggests may be central to narrative processing (Busselle & Bilandzic, 2008).

Source reminder

Researchers have debated whether the sleeper effect is caused by message recipients forgetting the source, disassociating the source and the message content, or differential rates of source and message decay (Hovland, Lumsdaine, & Sheffield, 1949; Hovland & Weiss, 1951; Pratkanis, Greenwald, Leippe, & Baumgardner, 1988). Kumkale and Albarracin's (2004) meta-analysis could not definitely answer this question; however, they did identify a negative relationship between source recall at Time 2 and persuasion at Time 2 (supporting the notion that memory is involved). The delay hypothesis postulates that delayed message effects could manifest for several

reasons, including decay or disassociation of source information over time. One way to unpack this relationship is to examine how a reminder about the source impacts persuasion. If memory is involved, then a source reminder may eliminate or reduce the increase in persuasion at Time 2.

H2a: The relationship between false belief endorsement and time will be moderated by the presence of a source reminder, such that the delayed effect will be greater for those not receiving a source reminder at Time 2.

Perceived reality

Past sleeper effect research has traditionally artificially manipulated the presence of a discounting cue. For example, participants could be told that a communicator is either high or low in credibility (Kumkale & Albarracin, 2004). In their study of written fictional narratives, Appel and Richter (2007) did not provide a discounting cue. Instead, they reasoned that readers considered fictional narratives to be untrue to ''some extent'' and that the ''text genre of the source'' would serve as a discounting cue in and of itself (p. 118).

Manipulating the presence of a discounting cue is problematic because it is not reflective of real-world communication; however, it also may be problematic to assume that fiction, as a genre, is a sufficient discounting cue. An alternative approach, recommended by Busselle and Bilandzic (2008), is to measure receiver perceptions concerning the reality of the message and then to examine whether perceived reality moderates message effects. Such an approach removes the artificiality of manipulating a cue as well as accounts for those individuals that view the material as more or less realistic.

In his construct explication of perceived television reality, Potter (1988) argued that there were three components underlying the idea. The first, and central, component he labeled ''magic window'' (p. 26). Magic window refers to ''belief in the literal reality of the television messages'' (p. 27). Potter noted that receivers could view all or part of a television program as real, and that they could view the program as fictional but still reflective of the real world.

Individuals who perceive fictional narratives as less realistic are potentially susceptible to delayed message effects because their discounting cue could become disconnected or disassociated from content. It is also plausible that low perceived realism leads to suboptimal storage of narrative information, a situation that could facilitate reappropriation of the content. Both possibilities suggest that low perceived reality could induce a stronger delayed effect.

H2b: The relationship between false belief endorsement and time will be moderated by perceived reality, such that the delayed effect will be stronger for those with lower perceived reality.

Character identification

According to Potter (1988), the second component of perceived television reality is identity. Identity is defined as ''a feeling of closeness to characters on television

shows'' (p. 28). Identity is very similar to the construct of character identification. Character identification is how much a person connects with main characters in a narrative (Cohen, 2001; Moyer-Gusé, 2008). Unlike perceived reality, greater character identification might increase the likelihood of a delayed message effect by disengaging defensive mechanisms that would otherwise challenge ideas in the story. For example, Moyer-Gusé and Nabi (2010) found that greater identification with characters in a dramatic narrative about unplanned pregnancy decreased counterarguing and, two weeks later, increased perceived vulnerability. Character identification might also be related to the formation of parasocial relationships (Giles, 2002), which could encourage distorted thinking over time by blurring the relationship between fiction and reality. Greater character identification could be predictive of greater false belief endorsement in general (i.e., regardless of time), but the present study is more interested in the potential for identification to influence retrieval and reappropriation over time.

H2c: The relationship between false belief endorsement and time will be moderated by character identification, such that the delayed effect will be stronger for those with higher character identification.

Narrative transportation

Narrative transportation has proven to be an important predictor of narrative effects in the past (Green & Brock, 2000). Transportation is the tendency for consumers of narratives to be captivated by the story (Green, 2004; Green & Brock, 2000). Individuals become cognitively and emotionally involved and the feeling is akin to the sense of becoming ''lost in a book.'' For instance, Gerrig (1993) described narrative transportation as similar to when a ''traveler assumes new characteristics (as called for by the narrative) as a consequence of undertaking [a] journey'' (p. 11). In essence, the reader gives up some of his or her real-world beliefs, in order to become fully immersed in the narrative. While Gerrig (1993) focused on transportation within written narratives, more recently researchers have argued that transportation should be included in all types of narrative accounts, including televised content (Green, Brock, & Kaufman, 2004).

Green (2005) argued that individuals seek out transportation experiences on a regular basis. As a result, transportation has been found to encourage beliefs that are consistent with the framework of the story (Green, 2004; Green & Brock, 2000). During transportation, individuals seem to stop filtering information in the narrative as critically as they might in other communication situations. Consequently, people are more likely to abandon real-world beliefs in favor of story beliefs, even if they are incorrect in nature (Green & Brock, 2000). Therefore, the more people are transported into a narrative text, the less likely they are to counterargue against false information presented in the narrative. Thus, like character identification, greater narrative transportation may influence false belief endorsement over time, as transportation disengages critical processing and encourages acceptance of story-based beliefs. Moreover, a delayed message effect could materialize because story

source and content may become dissociated over time (Marsh, Meade, & Roediger, 2003).

H2d: The relationship between false belief endorsement and time will be moderated by narrative transportation, such that the delayed effect will be stronger for those with higher narrative transportation.

Method

Design

All individuals ($N = 147$) in a 2 (time of false belief endorsement assessment) $\times$ 2 (presence of source reminder) between-participants experiment were randomly assigned to one of the four conditions. Each participant viewed a television program (45 minutes in length) and completed two surveys. The first survey was completed immediately after viewing the television program (Time 1) and the second survey was completed two weeks later (Time 2). The key outcome of interest (false belief endorsement) was assessed at either Time 1 or Time 2 (depending on condition). The presence of a source reminder was also manipulated so that participants either were reminded that they had watched a television program or not.

Procedure

Participants were recruited from a research pool of students enrolled in at least one communication course (e.g., introductory public speaking) and offered extra credit for participating in the study. Participants received full extra credit upon completion of both waves.

First wave

Participants entered the lab and were randomly assigned to an experimental condition. The participant sat down at a computer and viewed an unedited episode of *Boston Legal* (BL).

After watching the television program, participants completed a survey. The survey contained the following questions for all participants: demographics, perceived reality, character identification, and narrative transportation. Half the participants also completed a battery of questions that assessed the direction and strength of several beliefs related to the viewed program. Included in this battery was a question that assessed a false belief propagated by the episode of BL.

Second wave

Participants were e-mailed a follow-up survey two weeks later. The e-mail arrived roughly two weeks after the first wave and participants had 48 hours to complete the survey. Participants who had completed the belief battery during the first wave were sent a battery of questions unrelated to this study. Participants who did not receive the belief battery at Time 1 were sent the belief battery.

Sample

One hundred and forty seven college students participated in the study for extra credit. More females (58.5%) participated than males (40.8%). Participants ranged from 18 to 30, with a mean age of 19.6 years ($SD = 1.8$). The racial background of the participants was disproportionately Caucasian compared to U.S. demographics as a whole: 76.2% Caucasian, 6.1% African American, 15.0% Asian, and 4.8% Hispanic (participants could check more than one category).

Stimuli

Participants watched an episode of BL (''Nuts''; Kelley, Kreisberg, & Arkin, 2007). The BL episode was selected as treatment stimuli because it contained naturally occurring false information and depicted it as dramatized reality. In ''Nuts,'' the false belief that allergy auto-injectors (in this case, Epipens) are ineffective is propagated by several scenes depicting a teacher who is being sued for negligence because a child died in her classroom because of a severe peanut allergy. In her explanation of the incident, the teacher argues that she gave the child the auto-injector within a few seconds after the child's allergic reaction began, yet it still failed. The inaccurate portrayal of Epipens in this episode eventually resulted in ABC issuing a public explanation and apology (Kelley, 2007).

Independent variable

Prior BL episode exposure

To control for prior exposure to the episode, participants were asked whether they had seen the episode before (1 = *Yes*, 2 = *No*). Very few participants had seen the episode previously ($M = 1.97$, $SD = 0.16$).

Time

Participants completed the belief battery either immediately after watching the stimulus (Time 1) or roughly two weeks later (Time 2).

Source reminder

Half the participants received a reminder shortly before completing the belief battery (at Time 1 and Time 2). The reminder stated: ''As a reminder, you recently watched an episode of *Boston Legal*.'' The reminder was included as past research has suggested that delayed message effects can occur because people forget source information over time.

Perceived reality

Four items (7-point scale, *strongly disagree* to *strongly agree*), from Rubin (1981), measured the magic window component of perceived television reality, or the ''belief in the literal reality'' of the television programs (Potter, 1988, p. 27). Items were modified to refer to the program genre of interest (i.e., legal dramas). The four items were ''television legal dramas present things as they really are in life,'' ''television legal dramas let me see what happens in other places as if I were really there,'' ''television

legal dramas let me see how other people live,'' and ''television legal dramas show life as it really is.'' The four-item scale demonstrated solid reliability ($\alpha = 0.81$, $M = 4.45$, $SD = 1.22$).

Character identification

Nine items (7-point scale, *strongly disagree* to *strongly agree*), from Cohen (2001), measured the identity component of perceived television reality (Potter, 1988). The nine items assessed the extent to which the viewer assumed ''the identity, goals, and perspective'' of main characters in the story (p. 261). For example, participants were asked to rate the following statement: ''While watching, I felt I could really get inside the main character's 'head'" (p. 256). The nine-item scale demonstrated solid reliability ($\alpha = 0.89$, $M = 3.87$, $SD = 1.25$).

Narrative transportation

Eleven items (7-point scale, *strongly disagree* to *strongly agree*), from Green and Brock (2000), measured how much the participant was absorbed into the television program. For example, participants were asked to rate the following statement: ''I could picture myself in the scene of the events described in the narrative'' (p. 704). In the past, Green and Brock's transportation scale has demonstrated moderate reliability (e.g., $\alpha = 0.76$). The scale performed in a similar fashion in the present study ($\alpha = 0.73$, $M = 3.90$, $SD = 0.87$). Green and Brock's full scale includes 15 items, four of which are content specific (i.e., questions based on the content of the program). Only the 11 general items were used in this study.

Dependent variable

False belief endorsement

In line with past research (Appel & Richter, 2007; Krosnick & Petty, 1995), participants filled out items measuring belief extremity (7-point scale, *strongly disagree* to *strongly agree*). Eleven belief questions were created, 10 that were true and one that was false. The false belief question represented ideas perpetuated by the BL episode (the notion that Epipens do not work). The other 10 beliefs were assessed to mask the false belief questions.

Results

Hypothesis 1 (H1) posited that for those exposed to a television show depicting a false belief, false belief endorsement would be greater for individuals queried two weeks after exposure (Time 2) than for individuals surveyed immediately after viewing the program (Time 1). Additionally, it was hypothesized that a source reminder (H2a), perceived reality (H2b), character identification (H2c), and narrative transportation (H2d) would moderate the relationship. To test these hypotheses, four hierarchical multiple regressions were carried out to examine the relationship between time and false belief endorsement. To control for participant viewing behavior, prior

Table 1 False Belief Endorsement by Time and Cognitive Moderators

	β	*r*	ΔR^2
Block 1: Prior BL episode exposure	−.09	.09	.008
Block 2: Time	.29	.30	.082***
Block 3a: Source reminder	.06	.31	.004
Block 3b: Perceived reality	−.16	.34	.025*
Block 3c: Character identification	.14	.33	.018†
Block 3d: Narrative transportation	.11	.32	.013
Block 4a: Time × Source reminder	.45	.33	.016
Block 4b: Time × Perceived reality	−.64	.39	.035*
Block 4c: Time × Character identification	.13	.33	.002
Block 4d: Time × Narrative transportation	.10	.32	.001

Note: Standardized β, *r*, and R^2 change are listed at each block. To reduce multicollinearity, four separate hierarchical regression analyses were carried out with different moderators and interactions for Blocks 3 and 4.
($^{\dagger}p < .10$. $^{*}p < .05$. $^{***}p < .001$.)

exposure to the stimuli episode was entered in the first block. Time was entered in the second block, one of the moderator variables (source reminder, perceived reality, character identification, or narrative transportation) in the third block, and the Time × Moderator variable interactions in the fourth block. All predictor variables were centered per the guidelines of Aiken and West (1991). Interactions were analyzed using probing procedures outlined by Hayes and Matthes (2009).

Table 1 reports the results of the hierarchical regression analyses. Consistent with H1, time was significantly related to false belief endorsement ($b = 0.91$, $SE = 0.26$, $p < .001$). Individuals queried two weeks after exposure to the television program were more likely to endorse the false belief ($M = 3.48$; 95% CI: 3.11–3.85) than those queried immediately after exposure ($M = 2.69$; 95% CI: 2.34–3.04). Of the moderator variables, perceived reality was significantly negatively related ($b = -0.22$, $SE = 0.11$, $p = .047$) and character identification was marginally positively related ($b = 0.20$, $SE = 0.12$, $p = .090$) to false belief endorsement. Source reminder ($b = 0.20$, $SE = 0.27$, $p = .446$) and narrative transportation ($b = 0.22$, $SE = 0.15$, $p = .157$) were not related to false belief endorsement.

Important for the present study were the interactions between time and the moderator variables. False belief endorsement was not predicted by Time × Source reminder ($b = 0.84$, $SE = 0.53$, $p = .116$), Time × Character identification ($b = 0.12$, $SE = 0.23$, $p = .621$), nor Time × Narrative transportation ($b = 0.11$, $SE = 0.31$, $p = .715$). However, consistent with H2b, false belief endorsement was significantly predicted by Time × Perceived reality, ($b = -0.51$, $SE = 0.21$, $p = .017$). To probe the interaction, the conditional effect of time was examined at three different intervals of perceived reality (the mean and ±1 *SD*). The effect was significant at 1 standard deviation below the mean ($b = 1.52$, $SE = 0.36$, $p < .001$) and at the

mean ($b = 0.88$, $SE = 0.25$, $p < .001$), but not significant at 1 standard deviation above the mean ($b = 0.26$, $SE = 0.36$, $p = .470$). Thus, the analysis revealed that the conditional effect increased in magnitude as perceived reality decreased.

Follow-up analyses

Individuals exposed to the television program were more likely to endorse a false belief when queried at Time 2. While a logical explanation for this finding has been proposed, it is also necessary to consider other explanations. For example, in the present study, is there something about the experiment that is causing participants to rate all beliefs higher two weeks after exposure?

To test this idea, a one-way multivariate analysis of variance (MANOVA) was conducted with time as a fixed factor and all of the remaining (nonfalse) belief questions as dependent variables. For the MANOVA, there was a significant main effect for time for four of the belief variables (beliefs #1, 2, 3, and 4; see Appendix). In all cases, the mean belief scores were significantly lower for those who completed the battery at Time 2. Thus, participant ratings were not generally higher at Time 2; in fact, they were generally lower.

Discussion

The present study identified a delayed message effect for those exposed to a televised fictional narrative containing false information; false belief endorsement was significantly higher for those queried two weeks following exposure (i.e., similar to an absolute sleeper effect). Based on Cohen (1988), the observed effect was moderate in size (for the time main effect, variance explained = 8.2%; akin to a Cohen's $d = .59$), which means that it was slightly smaller than the previously observed delayed effect for written fictional narratives (difference between control and treatment at Time 2: $\eta^2 = 0.28$; Appel & Richter, 2007) and substantially higher than the mean sleeper effect from Kumkale and Albarracin's (2004) meta-analysis (Cohen's $d = .08$; 95% CI: 0.03–0.13). The difference between the present study and Appel and Richter's (2007) could reflect variance in the effect, or perhaps a weakness of the effect size η^2. It has been noted in the past that η^2 is prone to inflation especially in smaller samples ($N = 81$ participants in Appel & Richter, 2007; for a discussion of η^2 and $\partial\eta^2$, see Levine & Hullet, 2002).

The discrepancy between the present study and Kumkale and Albarracin's (2004) meta-analysis, however, is consistent with the idea that delayed message effects in narrative communication situations may be larger and meaningfully different from those found in expository communication situations. Several conditions must be met for nonnarrative delay effects to emerge (Cook et al., 1979). Recognition of these conditions has helped to clarify existing research, but it has also suggested that delay effects are somewhat rare. In other words, the number of conditions required for a delay effect to materialize significantly reduces the likelihood that such an effect will occur in expository situations.

Small effects that are rare can still be meaningful, especially if they occur in key decision-making situations. But the present study identified a somewhat larger effect that may happen with some frequency. People are bombarded by mass media every day all over the world, and a sizeable (and growing) body of mass communication research has demonstrated that much of this content is distorted in a multitude of ways. Media narratives provide misrepresentations or inaccurate information about gender, race, class, sexual orientation, and a variety of social behaviors (see, e.g., Holtzman, 2000; Kahlor & Morrison, 2007; Shrum, Wyer, & O'Guinn, 1998). Thus, the opportunity for delayed message effects in narrative situations—small or sizeable—is considerable.

Consistent with the delay hypothesis, two studies have now shown that fiction (written and televised) can produce a delayed message effect. Insufficient evidence exists to definitively say whether the delay hypothesis is accurate. However, it is already clear that traditional single exposure studies with only an immediate measure of attitudes and beliefs are insensitive to such a possibility. The delay hypothesis suggests that media effects research could benefit from further attention to long-term storage and retrieval of media content.

Another finding that is consistent with the logic of the delay hypothesis is the significant moderation of the delayed message effect by perceived reality. Past research has observed that discounting cues (i.e., a reason to disbelieve) can trigger delayed effects. The present study found that perceived reality of the genre itself, measured after exposure, had the same explanatory power.

Future work in this area should address at least four issues. First, sleeper effect research within expository communication situations has focused heavily on the underlying cause of the effect (i.e., forgetting, dissociation, differential decay). Pursuit of this same question within the context of narrative communication would be meaningful as it is altogether possible that delayed message effects following exposure to expository and narrative messages will differ in this regard. Measuring participant recall of source and message content as well as association between the two would serve to answer this key question. Moreover, media effects researchers should examine whether information from fictional narratives is reappropriated by cognitive networks and, if so, how this might invoke delayed message effects. Importantly, researchers should examine whether vivid content in fictional narratives is more likely to be reappropriated as this might help to identify situations where delayed message effects are more likely to manifest. The long-term goal of the research should be the formation of postulates that capture the family of delayed message effects.

Second, media effects researchers should investigate how long it takes people to digest narrative information, especially content that is emotionally charged. It would be useful to know, for example, the mean processing time required to develop stable attitudes and beliefs following exposure to fear- or anger-inducing media content. This could influence whether researchers measure attitudes and beliefs immediately after exposure (a common practice at the moment) or at some later point in time. Ideally, media effects researchers would routinely measure for change after the

mean processing time had elapsed. This is a foundational question that needs to be addressed for significant progress to be made concerning delayed message effects.

Third, the current measure of perceived reality would benefit from psychometric refinement. One ambiguity about perceived reality is whether it is more meaningful to assess this construct at the level of genre (e.g., legal drama), program (e.g., BL), or episode. The present study assessed perceived reality at the level of genre, but it may be the case that a more specific measure could identify nuanced perceptions of the content such as program or episode specific skepticism.

Finally, the false belief depicted in the current stimuli (i.e., during a severe allergic reaction, EpiPens are ineffective for preventing death) was actually challenged by characters in the episode. This may explain why false belief endorsement was low for all participants whose endorsement was assessed at Time 1. One strength of the current design is that it may be more representative of media falsities that are challenged (at some level), but it would be interesting to examine whether removing these challenges increased false endorsement at Time 1 for those who rated the program high in perceived reality. Such a finding would be consistent with past sleeper effect research.

Limitations

The present study was interested in cognitive processes so college students were utilized as study participants. College students may be a suitable proxy for other groups in this case; however, we cannot rule out the possibility that the sample influenced the results. For example, motivation and ability were found to be significant predictors of the sleeper effect (Kumkale & Albarracin, 2004), and there is good reason to believe that college students differ from the population as a whole on these two fronts. Additional replications with both college and noncollege samples are necessary before generalizations are in order. The study also utilized a two-wave design to examine effects over time. It is possible that additional measurements of false belief endorsement at later points in time would reveal a different final outcome (e.g., eventual decay of belief endorsement). In other words, given the current design, it is impossible to know how enduring or consistent this effect is over longer periods of time. For instance, a curvilinear trend seems possible (and maybe logical), with increased persuasion eventually followed by a gradual decrease over time. Designs with several data collection points extended over a long period (e.g., months or years) will help to resolve this question. The measure for character identification asked participants to assess their perceptions about the main character of the program. It was assumed (perhaps incorrectly) that participants would respond to the scale using the attorney at the center of the BL episode as the referent. However, it is possible that participants were thinking of other characters (e.g., the teacher) for those questions as the main character was not specifically identified in the measure. Future work should examine the influence of adding a named referent, a practice that has been employed with character identification measures in the past (e.g., Cohen, 2001; Smith, Downs, & Witte, 2007). Finally, participant memory of the initial source and knowledge of

the public apology (issued by the BL producers) were not measured. The former could have served to test postulates about forgetting, dissociation, and differential decay whereas the latter may have influenced participant perception of the stimuli.

Conclusion

Appel and Richter (2007) recently tested for a delayed message effect following exposure to a written fictional narrative. They found a delayed increase in persuasion; a finding that was replicated and extended in the present study using televised fictional narratives. The intersection of narrative research and delayed message effects research is promising, in that it encourages more research on how (and whether) effects unfold over time. We have studied media effects long enough to know that, in the short-term, large effects are rare and small or no effects quite common. Perhaps, it is time to examine what happens later.

Appendix

Belief battery

1. College students are solicited for credit cards.
2. Many of the people have credit card debt.
3. Credit card debt is stressful.
4. Detectives ask aggressive and/or leading questions.
5. Fingerprints can identify suspects.
6. During a severe allergic reaction, EpiPens are ineffective for preventing death. (false)
7. Lawyers dress professionally.
8. Severe food allergies can cause death.
9. Living with a food allergy affects many facets of a person's life.
10. Teachers are trained in first aid.
11. Traces of peanuts can trigger an allergic reaction.

Note. Question 6 is a false belief propagated by the episode of *Boston Legal*. The other belief statements were included to conceal the false belief statements.

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延迟假设：媒介效应随时间变动的表现形式

【摘要：】

本文通过组间实验，测试实验参与者（N=147）在观看含有虚假信息情节的法律电视剧集之后的延迟效应。较刚刚看完节目即参与调查，参与者在观看节目两个星期之后更有可能赞同虚假的信息。节目感知的真实性影响时间和对错误信息的认同之间的关系。与延迟假设相一致，那些在观看之后认为法律情节不属实的参与者在第二次检测中有显著较高的相信虚假信息的分数。

La Hipótesis de la Demora: La Manifestación de los Efectos de los Medios a través del Tiempo

Un experimento entre participantes (N = 147) fue puesto a prueba para la presencia del efecto de demora seguido de la exposición a un episodio de un drama legal que contenía información falsa. Los participantes apoyaron más probablemente las creencias falsas cuando fueron preguntados dos semanas después de ver el programa en vez de inmediatamente después de la exposición. La relación entre el tiempo y el apoyo a la creencia falsa fue moderada por la percepción de la realidad del programa. Consistente con la hipótesis de la demora, aquellos que percibieron al drama legal como no realista luego de la exposición tuvieron significativamente mayores resultados de creencias falsas al segundo tiempo.

Palabras claves: hipótesis de la demora, narrativa, efecto de dormir, creencias falsas, realidad percibida

L’hypothèse du délai : la manifestation des effets médiatiques au fil du temps

Une expérience entre participants (N = 147) a cherché la présence d’un effet différé suivant l’exposition à un épisode d’une émission dramatique à thème juridique contenant de fausses informations. Les participants étaient plus susceptibles d’adopter de fausses croyances s’ils étaient interrogés deux semaines après le visionnement de l’émission plutôt qu’immédiatement après l’exposition. L’association entre le passage du temps et l’adoption d’une fausse croyance s’est révélée être modérée par la perception de réalité de l’émission. Conformément à l’hypothèse du délai, les gens ayant perçu l’émission comme étant irréaliste immédiatement après l’exposition présentaient des résultats significativement plus élevés quant aux fausses croyances au deuxième moment.

Mots clés : hypothèse du délai, narratif, effet d’incubation, fausses croyances, perception de la réalité

Die Verzögerungshypothese: Die Manifestation von Medienwirkungen im Zeitverlauf

In einem Experiment (Between-Subject Design, N=147) testeten wir auf das Vorhandensein zeitlich verzögerter Wirkungen nach der Rezeption einer Folge eines juristisches Dramas, in dem falsche Informationen vermittelt wurden. Die TeilnehmerInnen stimmten den falschen Behauptungen eher zu, wenn sie zwei Wochen nach der Rezeption befragt wurden als direkt nach dem Sehen der Folge. Der Zusammenhang zwischen der Rezeption der Sendung und der Zustimmung zu falschen Behauptungen wurde durch die wahrgenommene Realität der Sendung moderiert. Im Einklang mit der Verzögerungshypothese zeigte sich, dass diejenigen, die die Sendung nach der Rezeption als eher unrealistisch bewerteten, zum Zeitpunkt 2 signifikant höhere Werte bei den falschen Behauptungen hatten.

Schlüsselbegriffe: Verzögerungshypothese, Narration, Schläfereffekt, falsche Überzeugungen, wahrgenommene Realität

연기가정: 시간에 대한 미디어 효과들의 명시들

요약

상호 참가자 실험 (N=147)이 잘못된 정보를 포함하는 법률드라마 에피소드에 대한 추가적인 노출에 대한 연기된 효과의 존재를 위해 조사되었다. 참여자들은 즉각적인 추가 노출보다는 프로그램을 시청한뒤 이주후에 질문을 던졌을때 잘못된 믿음들에 대해 인정하려는 경향이 있었다. 시간과 잘못된 믿음인정사이의 관계는 프로그램의 인지된 사실성에 의해 중재되었다. 연기가정과 일관되게, 추가적인 노출에 비실제적이고자 하는 법률드라마를 인지한 사람들은 중요한 정도로 잘못된 믿음을 가지고 있었다.