

Environmental Orientations and News Coverage: Examining the Impact of Individual Differences and Narrative News

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This study examined the impact of narrative environmental news on issue and message attitudes, and the extent to which such attitudes might be moderated by individuals' environmental orientations. We conducted an experiment in which we asked participants to read either a narrative or informational newspaper article on the environmental consequences of shale gas drilling. Individuals' environmental orientations were measured a week before the experiment. Results indicated significant interaction effects between news formats and individuals' environmental orientations on transportation, positive cognitive responses, sympathy, and issue attitudes. Those who were more concerned about the environment were more affected by narrative news than those less concerned. These findings suggest that news narratives have stronger effects when they resonate with individuals' predispositions.

Keywords: narrative news, news framing, environmental values

In recent years, researchers in both communications and psychology have investigated the impact of narratives on individuals in various areas such as news and health communication (see Green, 2006; Mazzocco, Green, Sasota, & Jones, 2010; Shen, Sheer, & Li, 2015). Narratives are essentially the stories that we hear and read almost every day. The use of narratives permeates our daily lives. Within news reporting, journalists routinely use narratives in covering today's social and political issues. There is a general belief that compared with informational or hard news, narrative news is more engaging and therefore more likely to draw audience interest (Knobloch, Patzig, Mende, & Hastall, 2004; Kramer, 2001). Researchers have found that narratives affected individuals by transporting them into the narrative world and involving them cognitively and emotionally (Green, 2006). The impact of narratives, as some have

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argued, can be stronger and more enduring than that of traditional message formats, such as fact-based information or rhetorical arguments (Dal Cin, Zanna, & Fong, 2004; Green, 2006).

This study contributes to existing research by examining the effects of narrative news about the environmental impact of gas drilling on issue and message attitudes and evaluating how such impact might be moderated by individuals' environmental orientations. Evidence from prior research has shown that in processing media messages, individuals often bring their own predispositions and value orientations to the interpretive process (see Domke, Shah, & Wackman, 1998; Schemer, Wirth, & Matthes, 2012; Shen, 2004). However, more research is needed to understand the extent to which individuals' predispositions will moderate the effects of news narratives. With that in mind, we conducted an experiment whereby we measured individuals' environmental orientations and then exposed participants to news reports—narrative or informational—on the environmental consequences of drilling. Our goal was to explore whether individual differences in environmental orientations—between those with high or low environmental concerns—would affect news narratives' impact on issue attitudes, cognitive responses, sympathy, and transportation. In the sections below, we will provide the conceptual background and rationale for our research. We will then present the details of our experiment. This will be followed by our analyses of the results and a discussion of the implications of our research findings.

Conceptual Background

According to Green and Brock (2000), a narrative is "a story that raises unanswered questions, presents unresolved conflicts, or depicts not yet completed activity; characters may encounter and then resolve a crisis or crises" (p. 701). Stories often contain characters, plots, and causal relationships, thus making them distinct from exemplars and other messages. Exemplars, for instance, are usually descriptions of events or issues without the necessary plots or causal relationships that are typical of narratives (Green, 2006; Zillman, Gibson, Sundar, & Perkins, 1996). Narratives often describe the experience of others for entertainment or information. As a result, their persuasive intention is often implicit. In contrast, nonnarratives typically use rhetorical arguments and informational messages with the explicit intention to either persuade or inform (Dal Cin et al., 2004). Narratives' unique features thus make them potentially more effective in communicating information than other messages. In recent years, researchers have found that narratives can affect individuals both emotionally and cognitively (Green & Brock, 2000; Hinyard & Kreuter, 2007). They have been found to be more effective than nonnarrative messages in changing attitudes and opinions on several issues. For example, Mazzocco et al. (2010) examined the impact of narratives in describing two political issues—tolerance of gay people and the success of affirmative action. They found that compared with rhetorical articles, narratives had a greater impact on individuals' attitudes toward both issues (Mazzocco et al., 2010). Similarly, Oliver, Dillard, Bae, and Tamul (2012) demonstrated that compared with nonnarratives, narrative news had a greater impact on readers' attitudes.

The primary mechanisms underlying narrative persuasion are transportation and identification. Transportation has been conceptualized as a mental state where one's "attention, imagery, and feelings are focused on story events" (Green, 2006, p. 164). It is similar to absorption or immersion in a story. Green and Brock (2000) showed that transportation into a written narrative led to narrative-consistent

beliefs and attitudes. Oliver et al. (2012) provided similar results in their study on the effects of news narratives on attitudes toward stigmatized groups. Narratives can also have an impact on individuals via identification with story characters. While transportation can be viewed as a “general experience” of being immersed in a narrative and attention to its plot, identification is the reader’s involvement with specific characters (Tal-Or & Cohen, 2010). When readers identify with a narrative, they are likely to be emotionally involved with the characters. Escalas and Stern (2003) identified empathy and sympathy as two related emotional constructs in response to narratives. Whereas sympathy is “one’s feeling of sorrow or concern” (Escalas & Stern, 2003, p. 567) for someone else’s welfare, empathy is one’s ability to share in or absorb another’s feeling. In a study of a television drama’s effects on behavioral intentions, Bae (2008) demonstrated that exposure to a narrative-based show had significant effects on viewers’ empathy and sympathy responses, which in turn predicted issue involvement and other persuasion outcomes. Similarly, prior research in narrative persuasion has also suggested that by involving readers or viewers in the storylines, narratives can overcome resistance and reduce the motivation to engage in counterarguing (Green, 2006; Moyer-Gusé & Nabi, 2010).

The evidence of narratives’ effectiveness has been substantial, and researchers in the recent years have found that narratives’ impacts on attitudes and other persuasive outcomes may also be moderated by individual differences in dispositional traits. Appel and Richter’s (2010) study provided evidence suggesting that individuals’ need for affect, as a disposition, moderated the effect of a fictional narrative on beliefs. In a similar vein, Thompson and Haddock (2012) found that narratives’ impacts on individuals differed significantly as a result of their need for affect and for cognition. Other individual difference variables that have been found to moderate the effects of narratives include transportability and the ability for mental imagery (see Zheng, 2014). To extend the prior research on individual traits and narratives, we aim to examine whether individuals’ issue-relevant value orientations might enhance or diminish a news narrative’s influence. From the early days of media effects research to the more recent scholarship in news framing and priming, scholars have found that the mass media’s influence tends to be contingent upon audiences’ preexisting attitudes and values (see Domke et al., 1998; Schemer et al., 2012; Severin & Tankard, 2001; Shen & Edwards, 2005; Zaller, 1992). This is because individuals are not merely passive recipients of media messages. The influence of media messages will therefore depend on how they interact with individuals’ prior knowledge and predispositions (Ho, Brossard, & Scheufele, 2008; Zaller, 1992). In fact, research in social psychology has indicated that individual differences in schemata and prior attitudes may act as cognitive filters that percolate the information we receive and digest, resulting in what is known as biased information process (Higgins, Bargh, & Lombardi, 1985).

Because of their chronic accessibility, predispositions can be easily activated and can influence our decision making and information processing as a result. Indeed, in examining the impact of media framing of the issue of welfare reform, Shen and Edwards (2005) found that individuals’ value orientations on individualism and humanitarianism—two core American values—significantly moderated responses to media framing messages on the issue. Similarly, Ho et al. (2008) found that value predispositions such as religiosity and deference to authority were significant factors in shaping public attitudes toward stem cell research.

Based on these findings, we expect that narrative news reports and individuals' environmental orientations will have an impact on attitudes toward the issue of gas drilling in the Marcellus Shale, a controversial issue that has divided the public in recent years. While gas drilling brings significant economic benefits, its environmental impact has drawn considerable public attention. A significant part of the media coverage of the environmental implications of drilling focuses on two formats: stories about how people's lives have been changed by drilling and informational reports regarding the environmental impact of drilling. Based on our analysis of media coverage of the issue, we put together two news reports for the present study: a news narrative report and an informational report. Our goal is to see whether the news narrative's impact on individuals' responses will be moderated by individuals' environmental orientations.

Research Questions

Prior research has provided evidence that narratives can be more effective than nonnarrative messages in both health messages and news coverage of issues (Green & Brock, 2000; Oliver et al., 2012). Scholars have also found that individuals' predispositions are likely to bias information processing, thus making messages consistent with prior values and attitudes more salient and accessible (Shen & Edwards, 2005; Zaller, 1992). Cumulative evidence from media effects research thus suggests that media messages that resonate with one's values and predispositions are often more positively evaluated and more effective. Although some scholars have suggested that there are significant variations in narratives' impact (see Zebregs, van den Putte, Neijens, & de Graaf, 2015), others have found that overall narratives, when compared with nonnarratives, could lead to attitude changes, increase empathy with characters, and reduce counterarguing (Green & Brock, 2000; Mazzocco et al., 2010; Van Laer, Ruyter, Visconti, & Wetzels, 2014). However, we do not know whether the effects of news narratives on the environmental consequences of drilling will interact with individuals' environmental orientations. An interaction will exist if those who have high environmental orientations or are more concerned about the environment find the news narratives more effective than the informational news reports. Our first research question therefore focuses on the interaction between narratives and predispositions. In other words, we ask whether, after reading the narrative news, those with high environmental values are more likely to oppose drilling for gas and to report more positive cognitive responses, more sympathy, and more transportation.

RQ1: Will there be an interaction between news report format and environmental orientations such that individuals with high environmental orientations will respond more positively to narrative news than those with low environmental orientations?

Another purpose of the present study is to explore the mechanisms underlying the impact of news narratives and environmental orientations. Prior research has identified several variables that mediate the impact of narratives, including transportation (Green & Brock, 2000), sympathy (Escalas & Stern, 2003), empathy (Bae, 2008), identification (Tal-Or & Cohen, 2010), and reduced counterarguing (Green, 2006; Moyer-Gusé & Nabi, 2010). Mazzocco et al. (2010) found that empathy, not cognitive responses, mediated narratives' impact on issue attitudes. In her study, Escalas (2004) found that transportation's impact on ad and brand attitudes were mediated by both affective and cognitive responses. Part of the purpose of this study is to test whether the impact of narrative news on individuals'

attitudes will be mediated by transportation, sympathy, or cognitive responses. Because limited prior research has explored the interaction between news narratives and value orientations, we formulate our second research question as follows:

RQ2. Will transportation, sympathy, or cognitive responses mediate the effect of narrative news and environmental orientations on issue attitudes?

Method

Design and Participants

The study used a 2 × 2 between-subjects factorial design with the two factors being news formats (narrative vs. informational) and environmental orientations (high vs. low). Data were collected among undergraduate students in a major public university as part of a large project on news effects (see Shen, Ahern, & Baker, 2014). We used a subset of the data collected from 88 undergraduate students¹.

Participants were recruited from several communication classes and received a small amount of course credit for their participation. A majority of the participants were female (80%) and the average age was 20. They were randomly assigned to two news report conditions. Based on their pretest responses, participants were classified, using a median split, into two groups with either high or low environmental orientations.

Procedure

We conducted the experiment in a regular classroom with traditional paper-and-pencil stimuli and instruments. At the beginning of the sessions, we informed the participants that they were to participate in a news reading experiment and that the newspaper articles were selected from a local newspaper. After they read the articles, we asked them to complete a questionnaire assessing their reactions to the articles and their attitudes toward the issue of shale gas drilling.

Manipulations

We manipulated message formats by creating narrative and informational newspaper articles on the issue of drilling for gas in the Marcellus Shale. Both articles focused on the health and environmental consequences of drilling on ground-water pollution. For the informational news report, we used the standard news format that begins with an introductory paragraph to establish the issue as a contentious point of policy with people on both sides and then provides relevant facts. The narrative news story was created using the structure of initiating event, conflicts confronted by the characters, and a resolution or outcome at the end (Knobloch et al., 2004; see details in Shen et al., 2014).

¹ We disclosed this information to the editor during the submission process. The research questions examined in the present study are conceptually different from those by Shen et al. (2014).

To check the manipulation of the stimuli, we asked participants to rate the newspaper articles on a scale from 1 (*based on a story*) to 7 (*based on factual information*). Results indicated that those reading the narrative news indeed perceived the narratives to be more story-based than those reading the factual news ($M = 4.05$ vs. 5.74 , $t = 4.84$, $p < .001$).

Measurements

Environmental orientation was measured in a pretest a week prior to the experiment using select items adopted from prior studies (e.g., Dunlap, Van Liere, Mertig, & Jones, 2000; Lee & Holden, 1999). Participants indicated on a scale from 1 (*disagree*) to 7 (*agree*) their agreement with four statements: "The balance of nature is very delicate and easily upset," "I am worried about the environmental situation," "When humans interfere with nature, it often produces disastrous consequences," and "Humans are severely abusing the environment." The scale has an acceptable reliability of $\alpha = .77$. We used a median split to create groups of high and low environmental orientation. As the items suggest, individuals with high (or low) environmental orientations are highly (or not highly) concerned about the environment.

We measured transportation using a 12-item scale (Green & Brock, 2000). Participants answered each item on a scale of 1 (*not at all*) to 7 (*very much*; $\alpha = .83$). Examples of these items are "I could easily picture the events in it taking place" and "I was mentally involved in the article."

To measure sympathy, we asked respondents the extent to which they were concerned, compassionate, and sympathetic for the individuals affected by the issue of drilling. The three items were measured on a scale from 1 (*not at all*) to 7 (*very much*).

To measure positive cognitive responses, we asked respondents to list up to eight thoughts after reading the reports. They were given two minutes to write their thoughts as concisely as possible, using key words or short phrases. After listing each thought, respondents were instructed to code them by indicating whether they were favorable or unfavorable to the major themes or arguments in the articles (see Cacioppo & Petty, 1981; Mazzocco et al., 2010). We then subtracted negative thoughts from positive thoughts and created a positive cognitive response index ranging from -8 to $+8$.

Respondents' issue attitudes were measured in a follow-up questionnaire. A single item was measured on a scale from 1 (*strongly opposed*) to 7 (*strongly in favor*) for "Marcellus Shale gas drilling in the region."

In addition, we measured respondents' prior exposure to media coverage of the issue. In particular, we asked how often they had either read or watched news related to the issue shale gas drilling in recent days. These two media-use variables were then used as control variables in our analysis.

Results

RQ1 focuses on the possible interaction between news report format and environmental orientation. In particular, it asks whether narrative news will have a greater impact on transportation,

sympathy, positive cognitive responses, and issue attitudes among individuals with high environmental orientations than it will on those with low environmental orientations. To explore the research question, we ran a MANCOVA analysis with news formats and environmental orientations as independent variables and transportation, sympathy, positive cognitive responses, and issue attitudes as dependent variables. Exposure to print and broadcast news coverage of the issue were the control variables. Means and standard deviations of the dependent variables across the experimental conditions are presented in Table 1.

Table 1. Means and Standard Deviations of Dependent Variables by Experimental Condition.

Dependent Variable	Narrative News		Informational News	
	High EO <i>n</i> = 19	Low EO <i>n</i> = 20	High EO <i>n</i> = 18	Low EO <i>n</i> = 21
Cognitive responses	4.05 (2.39)	2.95 (3.78)	1.33 (2.20)	2.86 (2.82)
Attitudes	2.58 (1.26)	3.85 (1.23)	3.56 (1.58)	3.38 (1.60)
Transportation	4.75 (.97)	4.22 (.61)	4.19 (.85)	3.51 (1.07)
Sympathy	6.05 (.77)	5.07 (.90)	4.89 (.98)	4.83 (1.25)

Note. Numbers without parentheses are means and those in parenthesis are standard deviations. EO = environmental orientations.

Results from our MANCOVA analysis showed that after controlling for prior exposure to media coverage of the issues, for both news formats, Wilks's $\Lambda = .83$, $F(4, 69) = 4.00$, $p = .01$, partial $\eta^2 = .17$, and environmental values, Wilks's $\Lambda = .85$, $F(4, 69) = 3.04$, $p = .02$, partial $\eta^2 = .15$, had significant main effects on the dependent variables (see Table 2). The interaction between news formats and environmental values was also significant: Wilks's $\Lambda = .86$, $F(4, 69) = 2.91$, $p = .027$, partial $\eta^2 = .15$.

Table 2. MANCOVA Analysis of Main and Interaction Effects.

Main Effects	<i>df</i>	Cognitive			
		Responses	Attitudes	Transportation	Sympathy
		<i>F</i>	<i>F</i>	<i>F</i>	<i>F</i>
News formats (NF)	1	4.44*	.44	8.51**	8.33**
Environmental orientations (EO)	1	.01	5.07**	7.23**	5.43*
NF \times EO	1	4.18*	4.44**	.68	6.17*
Error	74				

* $p < .05$, ** $p < .01$, *** $p < .001$

Analysis of the simple effects indicated that after reading the narrative news, respondents reported more transportation, $M = 4.48$ versus 3.83 , $p = .005$; more sympathy, $M = 5.55$ versus 4.85 , $p = .005$; and more favorable cognitive responses, $M = 3.49$ versus 2.15 , $p = .039$, than those reading the informational news. However, the narrative news report did not lead to significantly less favorable attitudes to drilling than the informational news report, $M = 3.23$ versus 3.46 , $p = .51$. The significant main effects of narrative news on positive cognitive responses, transportation, and sympathy are consistent with findings in prior research on narratives (Mazzocco et al., 2010). Individuals with high environmental orientations reported more transportation, $M = 4.47$ versus 3.86 , $p = .009$; more sympathy, $M = 5.49$ versus 4.94 , $p = .023$; and more negative attitudes toward drilling, $M = 3.05$ versus 3.61 , $p = .027$, than individuals with low environmental orientations. Environmental orientation did not have a significant impact on positive cognitive responses, $M = 2.69$ versus 2.90 , $p = .935$.

The MANCOVA analysis also indicated a significant interaction effect between news formats and environmental orientations on sympathy, $F(1, 72) = 4.44$, $p = .039$; positive cognitive responses, $F(1, 72) = 4.18$, $p = .045$; and issue attitudes, $F(1, 72) = 6.17$, $p = .015$, but not on transportation, $F(1, 72) = .07$, $p = .795$. The significance of these interaction effects is mostly due to the response differences for individuals with high environmental orientations who read the narrative news. Specifically, for high individuals with environmental orientations, those reading the narrative news had significantly more positive cognitive responses, $M = 4.05$ versus 1.33 ; more negative issue attitudes, $M = 2.58$ versus 3.56 ; more sympathy, $M = 6.05$ versus 4.89 ; and more transportation, $M = 4.75$ versus 4.19 , than those reading the informational news. However, among individuals with low environmental orientations, those reading the narrative news reported more transportation, $M = 4.22$ versus 3.51 , than those reading the informal news. News formats had no significant effect on the other three dependent variables for those low on the environmental orientation scale. These results suggest that although both environmental orientations and news formats had significant effects on some of the key variables, their impact was largely due to a combination of high environmental values and narrative news. As can be seen in Table 1, after reading the narrative story, those with high environmental orientations reported more positive cognitive responses, more transportation, more sympathy, and more negative issue attitudes than all the other conditions. In other words, narrative news affected individuals with high environmental values more than any other individuals.

For those with high environmental orientations, is narrative's impact on issue attitudes mediated by sympathy, positive cognitive responses, or transportation? To answer RQ2, we first created an interaction term by multiplying news formats (coded 1 for the narrative condition and 0 for the information condition) and environmental orientations using the original continuous scale. We then used structural equation modeling to evaluate the impact of the interaction term on issue attitudes and used sympathy, positive cognitive responses, and transportation as the intervening variables. We assessed model fit by using the chi-square statistic, comparative fit index (CFI), and root mean square error of approximation (RMSEA).

Our initial analysis suggested the conceptual model (see Figure 1) did not fit the data well: $\chi^2(4) = 23.98$, $p < .001$, CFI = .78, RMSEA = .24. Because the path from transportation to issue attitudes was not significant, we followed similar research (see Oliver et al., 2012) and respecified the model by placing

transportation before sympathy. The respecified model (see Figure 2) resulted in a good fit for the data: $\chi^2(4) = 9.79, p = .081$; CFI = .94, RMSEA = .10 (Hu & Bentler, 1999; Kline, 2016).

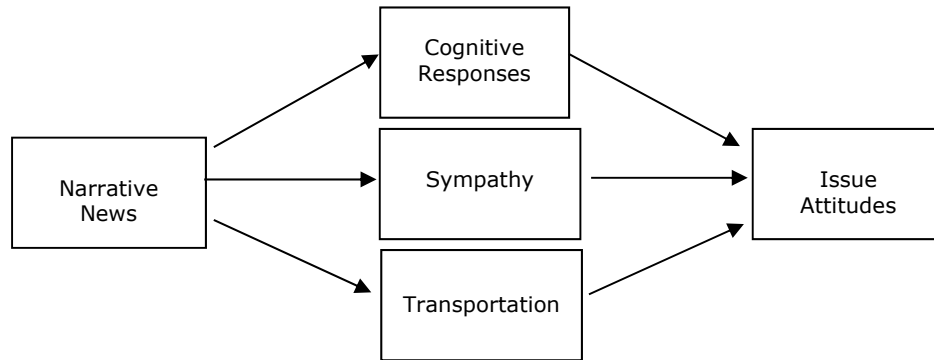


Figure 1. Conceptual path model.

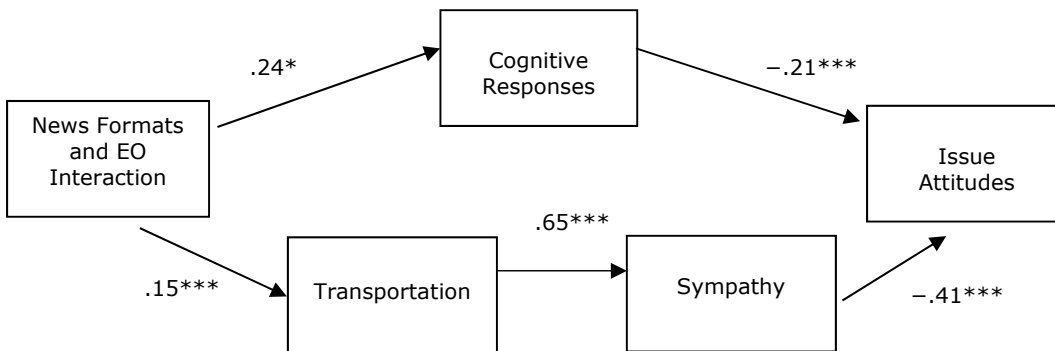


Figure 2. Final path model. Interaction term is the product of news formats and environmental orientations (EO). News reports were coded 1 for narrative news/high environmental orientation, and 0 for all information news conditions. * $p < .05$, ** $p < .01$, *** $p < .001$.

The respecified model thus suggests that the interaction term had a significant direct effect on favorable cognitive responses, $\beta = .24, p = .042$, and transportation, $\beta = .15, p < .001$, with transportation in turn having a direct effect on sympathy, $\beta = .65, p < .001$. Cognitive responses, $\beta = -.21, p < .001$, and sympathy, $\beta = -.41, p < .001$, in turn had significant effects on issue attitudes. These results indicate that when individuals with high environmental orientations were exposed to the narrative story, they reported more supportive cognitive thoughts and were more likely to be transported by the story and to develop sympathy for the characters. As a result, these individuals were more likely to have negative attitudes toward drilling.

Conclusion

This study was designed to explore the interaction between news narratives and environmental orientations on issue attitudes. Another goal was to investigate the extent to which such an impact might be mediated by transportation, sympathy, and positive cognitive responses. To do that, we conducted an experiment in which participants read either a narrative or an informational news report on the environmental consequences of gas drilling in the Marcellus Shale. Results suggested that both news reports and environmental orientations had some effects. While the interaction between the two had significant effects on positive cognitive responses, sympathy, and issue attitudes, the significant interaction effects were largely due to narrative news having a stronger impact on those high on the environmental concern scale than on those low on the scale. In other words, the more concerned individuals were about the environment, the more likely they were to be affected by environmentally related news narratives.

Before we discuss the study's implications, it is important to recognize its limitations. First, this study was based on an experiment that had a relative small sample. Future studies should consider testing our findings with larger sample sizes for greater statistical power. Second, this study focused on the single issue of shale gas drilling. Although we have demonstrated the importance of environmental orientations as a significant moderator, it is not known whether this extends to other individual predispositions or values. Future research should therefore continue to explore the effects of news narratives on various social and political issues, as this will further strengthen the external validity of the research findings. Furthermore, our measures for the manipulation check and issue attitudes need to be improved. The former could be misinterpreted in multiple ways, whereas the latter used a single item. Future research on narrative news effects should improve the wordings of both items.

These limitations notwithstanding, our study has several practical and theoretical implications. First, it extends the research on news effects. We showed that narrative news reports and informative news reports might have different implications for the audience, with the former exerting stronger influences. Prior research on news framing of social issues had not considered the nature of news formats such as narratives and nonnarratives. As such, this study's results suggest that as an approach to framing environmental issues, the use of narratives is worthy of additional research. Second, our study showed that although narrative news had significant impact on individuals, it may not necessarily affect everyone similarly. Instead, individuals' predispositions or prior beliefs (e.g., environmental orientations in the present study) can significantly moderate the impact of narratives. We also found that narrative news did not have a significant main effect on issue attitudes. This might be because attitudes among those with low environmental values did not change much in our study. However, environmental orientations did have a main effect on issue attitudes. Thus, understanding individual differences is critical to examining the impact of news narratives for researchers. Prior research has shown that attitudes toward issues may be partially determined by other characteristics of individuals, including their predispositions. Mazzocco et al. (2010), for instance, reported that individuals' attitudes toward issues differed between those who are high and those who are low in transportability, defined as the tendency to be transported into narratives. This suggests the importance of individual differences in predispositions, knowledge, and values in understanding individuals' responses to media messages, as found in prior research (see Ho et al., 2008;

Shen & Edwards, 2005). Our findings indicated that readers who were less concerned with the environment were more likely to resist the impacts of narratives, and that those who placed high value on conservation and environmental protection were more likely to be persuaded by narratives in environmental reporting. These results provide additional evidence that although narratives work well in reducing counterarguing in general, this impact may be limited by audiences' prior attitudes. This diverges from the assumption of narrative persuasion, as scholars in the past have argued that narratives work especially well in overcoming resistance and counterarguing (e.g., Green & Brock, 2000; Moyer-Gusé, 2008).

Finally, our research explored the mediational mechanisms underlying the interaction of narrative and individual differences. We found that when narratives resonated with people's value orientations, such reports would increase transportation, positive cognitive responses, and sympathy. These variables in turn mediated the interactive effects of narrative news and environmental orientations. This is consistent with the conclusion of several scholars that a narrative's impact is a result of the interplay of cognitive responses and emotional reactions (Mazzocco et al., 2010).

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