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# **Do Narrative Engagement and Recipients' Thoughts Explain the Impact of an Entertainment-Education Narrative on Discouraging Binge Drinking?**

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*Previous research suggests that narrative engagement (NE) in entertainment-education (E-E) narratives reduces counterarguing, thereby leading to E-E impact on behavior. It is, however, unclear how different NE processes (narrative understanding, attentional focus, emotional engagement, narrative presence) relate to different thought types (negative or positive; about the narrative form or about the target behavior) and to E-E impact. This study explores these relations in the context of alcohol binge drinking (BD).*

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*Participants (N = 172) watched an E-E narrative showing negative BD consequences, thereby aiming to discourage BD. The main findings were that the E-E narrative had a positive impact on discouraging BD on almost all assessed BD determinants such as beliefs and attitude. It was shown that attentional focus, emotional engagement, and narrative presence were associated with BD-discouraging impact, albeit on different BD-related determinants. No evidence was found that negative thoughts about BD mediated these associations. From this, we conclude that attentional focus, emotional engagement, and narrative presence were important for E-E impact but that negative thoughts about BD did not play a role therein. The study's empirical and practical implications are discussed.*

Research has shown that campaigns applying the entertainment-education (E-E) strategy have been effective in encouraging healthy behaviors (for an extensive overview, see Sood, Menard, & Witte, 2004). In the E-E strategy, pro-health messages are purposely incorporated into narratives with the aim of positively influencing determinants of behavior, such as beliefs and attitudes (Kaiser Family Foundation, 2004; Singhal & Rogers, 2004). For example, episodes of *Grey's Anatomy* (ABC; Schmir & Linka Glatter, 2005) and *ER* (NBC; Sherman Barrois & Albert, 2005; Zabel & Chulack, 2005) focused on the risk of breast cancer in women with a specific gene mutation (BRCA1). The purpose of the breast cancer storylines was to increase knowledge about the mutations and to encourage breast cancer screening. A study showed that these storylines indeed influenced recipients' knowledge, attitudes, intentions, and behaviors as intended (Hether, Huang, Beck, Murphy, & Valente, 2008).

To facilitate the development of impactful E-E narratives in the future, insight is needed into the mechanisms underlying the impact of E-E narratives on behavioral determinants (hereafter: E-E impact; Moyer-Gusé, 2008). Multiple researchers argue that recipients' engagement in E-E narratives plays an important role in E-E impact (Busselle & Bilandzic, 2009; Green & Brock, 2000; Kreuter et al., 2007; Slater & Rouner, 2002). Narrative engagement is characterized by engagement in the storyline of narratives and in the characters. Simply put, narrative engagement feels like being "lost" in a narrative (Green, Brock, & Kaufman, 2004). While engaged, recipients are less able and less motivated to produce negative thoughts (also referred to as counterarguments, unfavorable cognitions, counter thoughts, critical thoughts) about the narrative's content while they are viewing it. This reduced generation of negative thoughts should lead to E-E impact. However, previous studies on this mechanism show inconsistent results and differ widely on which thoughts are considered relevant in this regard. The present study, therefore, further

explores relations between narrative engagement, different thought types, and E-E impact.

## NARRATIVE ENGAGEMENT AND PREVIOUS RESEARCH ON ITS ASSOCIATION WITH THOUGHTS AND IMPACT

Narrative engagement is only one of the terms used to describe the phenomenon of intense narrative processing. Other terms are, for instance, transportation (Green & Brock, 2000) and absorption (Slater & Rouner, 2002). Although these terms more or less describe the same phenomenon (for more detailed information on similarities and differences, see De Graaf, 2010), narrative engagement is the only concept that describes this phenomenon as a process with distinct dimensions. Distinguishing dimensions has the advantage that a more detailed insight can be gained into how intense narrative processing is associated with E-E impact (Busselle & Bilandzic, 2009). Another advantage of using the narrative engagement concept is that, in contrast to other concepts, narrative engagement is easily understood in the context of audiovisual E-E narratives. In the transportation concept, mental imagery plays a prominent role (Green & Brock, 2002). Mental imagery is the process by which recipients create images of the narrative's events, persons, and events in their minds while processing a narrative. Audiovisual narratives provide these images visually and aurally to recipients, and, thus, the process of mental imagery is difficult to interpret in the context of audiovisual narratives (Busselle & Bilandzic, 2009). Consequently, in the case of studying E-E impact, narrative engagement is the most suitable concept.

Narrative engagement involves four dimensions (Busselle & Bilandzic, 2009): narrative understanding, attentional focus, emotional engagement, and narrative presence. First, narrative understanding implies that recipients understand the narrative and can easily make sense of it. Second, when recipients have attentional focus, they focus their attention solely on the events in the narrative, with their attention not distracted by noise, for example. Third, emotional engagement is the process by which recipients develop an emotional connection with characters. This connection includes feeling emotions for characters (sympathy), sharing emotions with characters (empathy), and having feelings of arousal. Consequently, emotional engagement is closely related to recipients' identification with characters (Busselle & Bilandzic, 2009; Cohen, 2001). Fourth, narrative presence refers to recipients' loss of self-awareness, to the sense that they are leaving the real world behind, and to feeling present in the story world.

Narrative engagement may lead to E-E impact via a cognitive pathway (e.g., Dunlop, Wakefield, & Kashima, 2010; Slater & Rouner, 2002). Recipients holding opposing beliefs or attitudes are likely to attack traditional persuasive messages in order to defend their current attitude (Slater & Rouner, 2002; Wegener, Petty, Smoak, & Fabrigar, 2004). Thus, in response to a negative message about binge

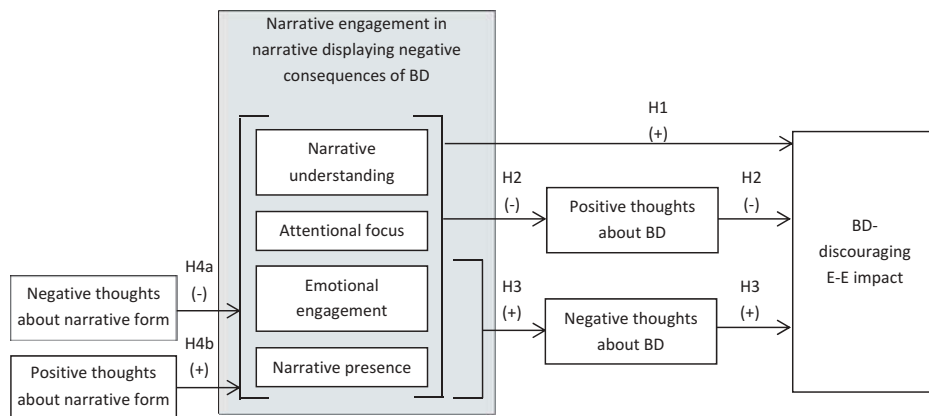
drinking (BD), recipients with a positive attitude toward BD will defend their attitude with positive thoughts about BD. The extended elaboration likelihood model (E-ELM; Slater & Rouner, 2002) suggests that engagement in E-E narratives blocks this defense mechanism because engaged recipients lack the cognitive ability and motivation to produce such defensive thoughts. By bypassing this defense mechanism, narrative engagement will lead to E-E impact.

Previous studies on relations between narrative engagement, thoughts, and E-E impact show inconsistent results. Some studies found that narrative engagement reduced unfavorable thoughts (e.g., Dunlop et al., 2010; Green & Brock, 2000), others found no relationship (Busselle, Bilandzic, & Zhou, 2009), and others found that narrative engagement was associated with increased generation of unfavorable thoughts (Moyer-Gusé & Nabi, 2010). Also, in some studies, the favorability of thoughts in response to narratives was positively associated with E-E impact (Banerjee & Greene, 2012; McQueen, Kreuter, Kalesan, & Alcaraz, 2011), whereas in other studies no relationship was found (e.g., Moyer-Gusé & Nabi, 2010; Slater, Rouner, & Long, 2006). So, empirical studies have not found a consistent relationship between narrative engagement and favorability of thoughts, and favorability of thoughts does not always explain E-E impact. An inspection of study characteristics reveals that most of the previous studies differed on at least two variables. First, studies differed in which thoughts were considered relevant for mediating the effect of narrative engagement on E-E impact: thoughts about the implicit persuasive theme (e.g., Slater et al., 2006), sometimes combined with thoughts about the stimulus material (e.g., Dunlop et al., 2010), or critical thoughts in response to the narrative (e.g., Green & Brock, 2000). Second, the studies differed in whether only unfavorable thoughts were considered relevant (e.g., Green & Brock, 2000; Moyer-Gusé & Nabi, 2010), or whether only favorable thoughts (e.g., Banerjee & Greene, 2012) or both unfavorable and favorable thoughts (e.g., Dunlop et al., 2010) were relevant. It has, therefore, been argued that a closer look is needed at how narrative engagement, thoughts, and narrative impact are associated (Hoeken & Fikkers, 2014; Moyer-Gusé & Nabi, 2010). For example, it is as yet unknown whether and how each of the four narrative engagement dimensions relate to unfavorable and favorable thoughts and, in turn, to E-E impact.

In the present study, relations between the four narrative engagement dimensions, different thought types, and E-E impact are explored in the context of alcohol BD.

## NARRATIVE ENGAGEMENT, THOUGHTS RELATING TO ALCOHOL (BINGE) DRINKING, AND E-E IMPACT

BD is defined as consuming at least four or five alcoholic drinks at one sitting, for females and males, respectively (National Institute on Alcohol Abuse and Alcoholism, 2004). This study employs an audiovisual E-E narrative portraying



**FIGURE 1** Proposed relations among narrative engagement dimensions, thoughts, and E-E impact on discouraging binge drinking (BD).

negative consequences of BD to discourage BD (van Leeuwen, Renes, & Leeuwis, 2013). Hypothesis 1 states that, if this E-E narrative displays negative consequences of BD, narrative engagement will be associated with a BD-discouraging impact (Figure 1, H1).

If Hypothesis 1—narrative engagement dimensions are associated with E-E impact—is supported, then this may be at least partly because narrative engagement dimensions influence recipients' thoughts about BD. Following E-ELM, we hypothesize that all four narrative engagement dimensions (narrative understanding, attentional focus, emotional engagement, and narrative presence) will occupy the cognitive resources that are necessary to produce defensive thoughts relating to the target behavior. Such defensive thoughts will be negatively associated with E-E impact. In the context of an E-E narrative displaying negative consequences of BD and pro-BD recipients, thus, Hypothesis 2 states that positive thoughts about BD partly mediate associations between narrative engagement dimensions and E-E impact (Figure 1, H2).

In addition to bypassing defensive thoughts, narrative engagement may trigger thoughts consistent with the experiences of characters with the target behavior and the narrative events (Cohen, 2001; Slater et al., 2006). E-E narratives typically portray how characters experience beneficial events relating to the target behavior or how the detrimental alternative relates to harmful events (Bandura, 2004). When recipients are engaged in the narrative and imagine themselves in the characters' shoes, this should trigger thoughts congruent with these events (Cohen, 2001; Slater et al., 2006). Thus, in the case of an E-E displaying negative consequences of BD, negative thoughts about BD may be triggered, and this may be associated with E-E impact.

Whereas we expect with Hypothesis 2 that all narrative engagement dimensions reduce the number of positive thoughts about BD, we do not expect that negative thoughts about BD mediate all associations between the narrative engagement dimensions and E-E impact. Because emotional engagement and

narrative presence create a strong attachment to the narrative's characters and facilitate vicariously experiencing the events relating to the target behavior, these processes may be especially powerful in triggering thoughts consistent with the narrative events. In contrast, attentional focus and narrative understanding may be more associated with the degree to which a recipient fluently processes the narrative. This does not necessarily include vicariously experiencing narrative events relating to, and generating thoughts about, the target behavior (Sukalla, Bilandzic, Schnell, & Busselle, 2014). On the basis of these ideas, Hypothesis 3 states that, if Hypothesis 1 is supported, negative thoughts about BD partly mediate associations between emotional engagement and narrative presence on the one hand, and E-E impact on the other hand (Figure 1, H3).

### NARRATIVE ENGAGEMENT AND THOUGHTS ABOUT THE NARRATIVE FORM

Recipients may respond to E-E narratives with thoughts not only about the target behavior, but also about the narrative form. Thoughts about the narrative form may include thoughts about realism (Busselle & Bilandzic, 2008) and about perceptual persuasiveness (Hall, 2003). Realism thoughts are, for example, thoughts about a narrative's coherency or plausibility. Thoughts about perceptual persuasiveness are thoughts about the degree to which a narrative creates a compelling story world, focusing on the means by which a narrative is brought across instead of focusing on the content of the narrative. In short, thoughts about the narrative form reflect the degree to which a narrative brings across a realistic and appealing story.

Negative thoughts about the narrative form may lower narrative engagement, because such thoughts interfere with fluently processing the narrative and connecting to the narrative world. These thoughts draw recipients' attention away from following the narrative events and toward the weak point of the narrative and interfere with making sense of the narrative, thereby disrupting narrative engagement (Busselle & Bilandzic, 2008). One study showed that recipients who in some way negatively evaluated a program were less engaged in the narrative than recipients who did not produce such thoughts (Busselle, Ryabovolova, & Wilson, 2004). In line with this, Hypothesis 4 states that negative thoughts about the narrative form will negatively affect narrative engagement dimensions (Figure 1, H4a).

Compared to the role of negative thoughts, the role of positive thoughts about narrative form in E-E impact is less clear. Some studies have suggested that positive thoughts in response to narratives are less likely to be generated than negative thoughts. Recipients' default position is to accept narratives (Gilbert, 1991), implicating that only negative thoughts will be generated when recipients come across something that does not meet their expectations

(Busselle & Bilandzic, 2010). A study by Hall (2003) suggested that recipients may also produce positive thoughts about the narrative form in response to E-E narratives. To our knowledge, one study investigated whether positive thoughts about the narrative form are associated with narrative engagement (Busselle et al., 2004). This study found that recipients who produced positive and neutral thoughts were not more engaged in a story than recipients who did not produce evaluative thoughts. However, because recipients with positive and neutral thoughts were considered as one group, the relation between positive thoughts and narrative engagement was not entirely clear. We think that positive thoughts about the narrative form may relate positively to narrative engagement, because these thoughts increase recipients' motivation to continue viewing the E-E narrative (Nabi & Krmar, 2004) and may directly increase interest in the narrative. Hypothesis 4b, thus, states that such positive thoughts relate positively to narrative engagement dimensions (Figure 1, H4b).

## METHOD

### Participants and Procedure

This online study employed a pre- ( $T_0$ ) and posttest ( $T_1$ ) design, with exposure to the audiovisual BD-discouraging E-E narrative as the test. Participants viewed the E-E narrative at a self-chosen location. The sample consisted of students from three institutions for higher education. Initially, 176 participants completed the  $T_0$  and  $T_1$  questionnaires. Four participants provided an incorrect answer to a simple factual question about the stimulus material. Therefore, we were not certain that they had watched the E-E narrative. These four participants were excluded from further analyses and, thus, the final sample consisted of 172 participants. Of the final sample, 97% had drunk alcohol at least once in their lifetime. Of those participants, 95% had been drinking the previous month, and 74% had been involved in BD the previous month. Ages ranged between 17 and 26 ( $M = 20.46$ ,  $SD = 1.72$ ), and 85% of the participants were female.

After students expressed their interest in participating in the study, they received an e-mail with a link to the informed consent form and the  $T_0$  questionnaire. After providing the informed consent, participants completed the  $T_0$  questionnaire with demographic questions and questions measuring past BD behavior and BD-related beliefs, attitude, BD intention, and willingness to engage in BD. Then, after on average 12 days (range: 3–30 days,  $SD = 6.28$ ), the participants viewed the E-E narrative online and completed the  $T_1$  questionnaire directly afterward. The  $T_1$  questionnaire assessed narrative engagement, thoughts, and BD-related beliefs, attitude, intention, and willingness. The definition of BD was provided throughout both questionnaires.

Participants from one educational institute received course credits ( $n = 76$ ). The other participants received cinema vouchers worth €5 ( $n = 96$ ). Regression



analyses showed that reward type did not affect E-E impact or narrative engagement dimensions.

### Stimulus Material

This study employed a shortened version (12 minutes) of an episode of *Roes* (*High* in English; VPRO; Schaling, 2008), a televised 11-episode E-E drama series broadcast in 2008 on Dutch national television. The drama series was part of an annual campaign to discourage substance and alcohol use among adolescents (van Leeuwen et al., 2013). The episode *Verliefd* (*In love* in English; VPRO; Martens & Simons, 2008) tells the story of a shy girl, Sacha, who visits a party where large amounts of alcoholic beverages are freely available. When she gets drunk, a boy, Thijs, with whom she is in love, sexually harasses her. The day after, she has a hangover and does not remember anything from the night before. She learns about the assault from a movie clip uploaded on the Internet. She is devastated. The episode ends with her visiting a police station, implying that she is going to file a complaint against Thijs.

The online  $T_0$  and  $T_1$  questionnaires were created with Qualtrics software (<http://www.qualtrics.com>). Qualtrics also randomly assigned participants to one of three exposure conditions: audiovisual disturbances condition ( $n = 53$ ), critical instruction condition ( $n = 57$ ), and standard version condition ( $n = 62$ ). These manipulations were intended to create variation among participants in the generation of negative thoughts about the narrative form. In the audiovisual disturbances condition, participants were exposed to the E-E narrative with beeps and stills added, aiming to suggest that the episode had been badly edited. In the critical instruction condition, participants were instructed to critically evaluate how the stimulus material was made (adapted from Escalas, 2007). In the standard version condition, the E-E narrative was not manipulated, and participants received only the instruction to watch the embedded video.

### Measures

*Past BD Behavior.* Past BD behavior was assessed at  $T_0$ . Participants indicated how often they had been involved in BD during the prior month (1 = *no recent drinking*, 2 = *have been drinking, but not BD*, 3 = *1–2 times*, 4 = *3–5 times*, 5 = *6–20 times*; Webb & Baer, 1995).

*BD Beliefs.* A pretest study showed that the selected narrative implies that BD may lead to loss of control, blackouts, regret, getting hurt, and sexual harassment; that these five outcomes are severe; and that viewers themselves may also experience these five negative outcomes after BD. Therefore, at  $T_0$  and  $T_1$ , we assessed three types of BD beliefs relating to these five negative outcomes. First, participants were presented statements, each stating that BD

leads to one of these five negative outcomes. On 100-point rating scales, participants were asked to indicate the degree to which they agreed with these statements (1 = *strongly disagree* to 100 = *strongly agree*; Cronbach's  $\alpha = .82$  [ $T_0$ ] and  $.89$  [ $T_1$ ]). Responses to these items at  $T_0$  and  $T_1$  were averaged to obtain composite negative outcome belief scores at  $T_0$  and  $T_1$ . A high value indicated a high subjective probability of BD leading to these negative outcomes.

Second, we assessed beliefs about perceived vulnerability to the five negative outcomes of BD. Participants were asked to indicate the likelihood that they would personally experience each of the negative outcomes after BD (1 = *that would definitely not happen* to 100 = *that would definitely happen*;  $\alpha = .87$  [ $T_0$  and  $T_1$ ]; Gibbons, Gerrard, Blanton, & Russell, 1998). Responses to these items at  $T_0$  and  $T_1$  were averaged to obtain composite vulnerability belief scores at  $T_0$  and  $T_1$ . A high value indicated strong beliefs about being vulnerable to these negative outcomes of BD.

Third, we assessed perceived severity by asking participants to indicate how they would feel after experiencing the five negative outcomes (1 = *very unhappy* to 100 = *very happy*,  $\alpha = .69$  [ $T_0$ ] and  $\alpha = .87$  [ $T_1$ ]; Gibbons et al., 1998). We recoded the given scores so that a high value indicated a high perceived severity of the negative outcomes of BD. Responses to these items at  $T_0$  and  $T_1$  were averaged to obtain composite severity belief scores at  $T_0$  and  $T_1$ .

*Attitude Toward BD.* Four items measured attitude toward BD at  $T_0$  and  $T_1$  by stating that BD is *very dangerous* (1) or *hardly dangerous* (100); *no fun* (1) or *fun* (100); *stupid* (1) or *smart* (100); and *negative* (1) or *positive* (100);  $\alpha = .77$  [ $T_0$ ] and  $\alpha = .81$  [ $T_1$ ]; Gibbons et al., 1998). Responses to these items at  $T_0$  and  $T_1$  were averaged to obtain a composite attitude toward BD scores at  $T_0$  and  $T_1$ . A high value indicated a positive attitude toward BD.

*BD Intention.* Intention to engage in BD was assessed at  $T_0$  and  $T_1$  with two questions asking participants to indicate the degree to which they intended to engage in BD the coming month (1 = *not at all intend to* to 100 = *very much intend to*) and expected to engage in BD the coming month (1 = *will definitely not happen* to 100 = *will definitely happen*;  $\alpha = .94$  [ $T_0$ ] and  $\alpha = .93$  [ $T_1$ ]; Gibbons et al., 1998). Responses to these items at  $T_0$  and  $T_1$  were averaged to obtain composite BD intention scores at  $T_0$  and  $T_1$ . A high value indicated a high intention to engage in BD in the coming month.

*BD Willingness.* Willingness to engage in BD was assessed at  $T_0$  and  $T_1$  via a 100-point rating scale with three items, preceded by the following statement about a risk-conducive situation for BD (Gibbons et al., 1998): "Suppose you were at a party where all alcoholic drinks were available for free. How likely is it that you would" followed by three items: "drink no alcohol," "drink 1 to 4 (females)/1 to 5 (males) alcoholic drinks," "drink at least 4 (females)/5 (males) alcoholic drinks." Each item was accompanied by a scale ranging from 1 = *would definitely not do so* to 100 = *would definitely do*

so. The first item was reversed, so a high value reflected more willingness to engage in BD. Because the scale with all three items had low reliabilities ( $\alpha = .42$  [ $T_0$ ] and  $\alpha = .39$  [ $T_1$ ]), the second item was omitted, resulting in a more reliable 2-item willingness scale ( $\alpha = .63$  [ $T_0$ ] and  $\alpha = .61$  [ $T_1$ ]). Responses to these items at  $T_0$  and  $T_1$  were averaged to obtain composite BD willingness scores at  $T_0$  and  $T_1$ . A high value indicated a high willingness to engage in BD.

*Narrative Engagement Dimensions.* Narrative engagement dimensions were measured at  $T_1$  with the narrative engagement scale (Busselle & Bilandzic, 2009). This scale consisted of 12 statements each accompanied by a 100-point rating scale from 1 = *strongly disagree* to 100 = *strongly agree*. We performed a factor analysis to investigate whether the scale consisted of four subscales measuring the four narrative engagement dimensions, as found by Busselle and Bilandzic (2009). In contrast to their findings, but consistent with another study (Woolley, 2012), our factor analysis showed that the items formed three factors, not four. The three items of the attentional focus subscale loaded on the first factor. The items tapped into the participants' attention to the narrative with items such as "My mind wandered while the movie was on" (reversed;  $\alpha = .84$ ). The three items of the narrative understanding subscale loaded on the second factor. The items measured participants' understanding of the narrative with items such as "I found it easy to follow the thread of the story" ( $\alpha = .74$ ). The original 3-item emotional engagement and 3-item narrative presence subscales both had low reliabilities ( $\alpha = .59$  and  $.55$ , respectively). Five of the six items on the emotional engagement and narrative presence subscales loaded on the third factor. Therefore, we combined these subscales into one emotions and presence scale ( $\alpha = .73$ ). Sample items are "During the movie, I felt sorry for (one of the) characters" and "During the movie, the story world seemed closer to me than the real world." The fourth factor consisted of one narrative presence item, and this item was dropped from further analysis. Responses to the items per factor were averaged to obtain composite scores on attentional focus, narrative understanding, and emotions and presence. High values indicated high narrative engagement on these dimensions.

*Thoughts.* Thoughts were assessed at  $T_1$  by a thought-listing task (Cacioppo, von Hippel, & Ernst, 1997). Participants were given 5 minutes to list a maximum of 10 thoughts they remembered having while viewing the E-E narrative. Two undergraduate coders coded the reported thoughts. The coders attended two 2-hour training sessions organized by the first author. In the first session, they received coding instructions. Then, they independently coded the reported thoughts of the same 10% of participants. Their assigned codes were discussed in the second training session. Then, they both independently coded all remaining thoughts.

The following reported thoughts were excluded from further analyses: neutral thoughts, questions (e.g., "why is there an increase in alcohol use among young people?"); narrative-unrelated statements (e.g., "I have to take

the cake out of the oven”); difficult to interpret statements (e.g., “sex”). Because of our interest in the role of recipients’ thoughts about the narrative form or about BD, affective reactions toward the character or the events (e.g., “I feel sorry for her!”) were also excluded.

The reported thoughts that were included were assigned two codes. The first code was assigned to identify the thought category, the second indicated the valence. Regarding the first code, we distinguished four categories: realism, perceptual persuasiveness, narrative-related BD thoughts, and nonnarrative-related BD thoughts. Intercoder reliability was calculated on the coded thoughts of 90% of the participants and was acceptable (Krippendorff’s alpha = .74; Krippendorff, 2004). The realism category consisted of thoughts evaluating, for example, whether or not the portrayed events could have happened in the real world, or whether or not the narrative was logical and coherent (Busselle & Bilandzic, 2008; Cho, Shen, & Wilson, 2014). The perceptual persuasiveness category consisted of thoughts evaluating, for example, acting quality, music, or originality of the story. These two categories, thus, focused on thoughts about the narrative form. The narrative-related BD thoughts category consisted of thoughts relating to the alcohol use of the characters. The nonnarrative-related BD thoughts category consisted of thoughts about alcohol use in general or about participants’ own experiences with alcohol. These two categories thus focused on the narrative’s objective, that is, to discourage BD.

The second code was given to identify the valence of each thought, thus, negative, positive, or neutral with respect to the narrative form or BD (Krippendorff’s alpha = .95, indicating high agreement [Krippendorff, 2004] based on the coded thoughts of 90% of the participants). The first code (category) and the second code (valence) were combined and used in the analyses. Thoughts coded as neutral were not included in the analyses. Disagreements were resolved by discussion among the coders and the first author until consensus was achieved.

*Control Variables.* An increase in the number of days between  $T_0$  and  $T_1$  was significantly associated with less changed negative outcome beliefs. It was also associated with more changed severity beliefs. To rule out any influence of the number of days between  $T_0$  and  $T_1$  on changes in BD determinants, we controlled for the number of days in those hypotheses where changes in these determinants were the dependent variables (Hypotheses 1–3). We also tested whether we should control for the influence of personal characteristics on the dependent variables. Narrative engagement was significantly associated with participants’ age and sex. E-E impact was significantly associated with the frequency of recent BD, and BD attitude at  $T_0$ . Whether or not nonnarrative BD thoughts were produced was associated with BD attitude at  $T_0$ . These variables were entered as covariates in the applicable analyses.

Most of the items used in this study as well as the instructions for the thought-listing task were originally published in English. Therefore, the items and instructions were translated from English into Dutch by simple translation. If necessary, the wordings were adapted to make them suitable for measuring the construct in the context of BD.

### Effect of Condition

As stated, we created three conditions to ensure sufficient variation in thoughts about the narrative form. As expected, logistic regression showed that participants in both the audiovisual disturbances condition and the critical instruction condition were more likely to report one or more negative thoughts about perceptual persuasiveness than participants in the control condition (odds ratio<sub>disturbances vs. control</sub> = 3.86, 95% CI = 1.23–12.10,  $p = 0.021$ , odds ratio<sub>instruction vs. control</sub> = 3.77, 95% CI = 1.22–11.67,  $p = 0.022$ ). Also, participants in the audiovisual disturbances condition were more likely to report one or more negative thoughts about realism than participants in the control condition (odds ratio<sub>disturbances vs. control</sub> = 2.71, 95% CI = 1.25–5.85,  $p = 0.011$ ). There was a significant effect of condition on attentional focus, such that participants' attentional focus in the audiovisual disturbances condition was lower than that of participants in the control condition ( $\beta = -.17$ ,  $p = .046$ ). To control for a direct influence of condition on narrative engagement dimensions, we included condition as a covariate in the analyses with narrative engagement dimensions as dependent variables (Hypotheses 4a and 4b). Condition had no significant effect on whether positive thoughts about perceptual persuasiveness or realism were produced, on positive or negative thoughts about alcohol, or on changes in BD determinants.

### Statistical Analyses Plan

Descriptive analyses were performed in *IBM SPSS Statistics* (version 22). To investigate whether the E-E narrative had a BD-discouraging impact, differences between  $T_0$  and  $T_1$  in scores on BD determinants were examined using a set of Wilcoxon signed-rank tests. For the main analyses, we computed the change scores on BD determinants between  $T_0$  and  $T_1$ , such that a negative change score could be interpreted as a BD-discouraging impact.

Hypotheses 1–4 were tested with *Mplus* (version 7.2; Muthén & Muthén, 2012). We tested both direct effects of narrative engagement dimensions on BD-discouraging impact (Hypothesis 1) and indirect effects through thoughts about BD (Hypotheses 2 and 3). For these analyses, we used weighted least-squares parameter estimates (WLSMV), a suitable procedure for mediation analyses with binary mediators, with theta parameterization. We obtained

bias-corrected 95% confidence intervals (one-tailed) for the indirect effects and used 1,000 bootstrap samples. In these analyses, we controlled for number of days between T<sub>0</sub> and T<sub>1</sub>, past BD behavior, T<sub>0</sub> BD attitude, and the T<sub>0</sub> values of the corresponding BD determinant.

To examine whether negative and positive thoughts about the narrative form were associated with narrative engagement dimensions (Hypotheses 4a and 4b), we regressed each narrative engagement dimension on thoughts in each of these thought categories. In these analyses, we controlled for condition, sex, and age.

## RESULTS

### Pre-Analyses

Prior to conducting the main analyses, we investigated whether the E-E narrative was able to discourage BD. The results showed that all assessed beliefs relating to the negative outcomes of BD (negative outcome beliefs, vulnerability beliefs, and severity beliefs) were more anti-BD at T<sub>1</sub> than at T<sub>0</sub> (see Table 1). Attitude toward BD and willingness to engage in BD were also

**TABLE 1** Pre- and Posttest Median Values of Binge Drinking (BD) Determinants, Significance of Effects, and Effect Sizes

	Median		Wilcoxon signed-rank test		
	T <sub>0</sub>	T <sub>1</sub>	<i>z</i>	<i>p</i> *	<i>r</i>
Negative outcome beliefs	37.1	51.6	-8.11	<.001	-.44
Vulnerability beliefs	33.6	36.3	-2.83	.005	-.15
Severity beliefs	83.7	84.9	-3.17	.002	-.17
Attitude toward BD	51.6	50.0	-4.60	<.001	-.25
BD intention	63.0	65.3	.30	.38	-.02
BD willingness	76.3	68.5	-2.60	.009	-.14

Note. BD = binge drinking.

\*One-tailed significance.

**TABLE 2** Correlations Among Changes in Binge Drinking (BD) Determinants

	1	2	3	4	5	6
1. Negative outcome beliefs	1.0					
2. Vulnerability beliefs	.38**	1.0				
3. Severity beliefs	.05	-.05	1.0			
4. Attitude toward BD	.08	.07	-.09	1.0		
5. BD intention	.03	-.17*	.09	.12 <sup>+</sup>	1.0	
6. BD willingness	-.03	-.15*	-.05	.10 <sup>+</sup>	.14*	1.0

Note. BD = binge drinking.

\**p* < .05, \*\**p* < .01, <sup>+</sup>.05 < *p* < .1 (one-tailed significance).

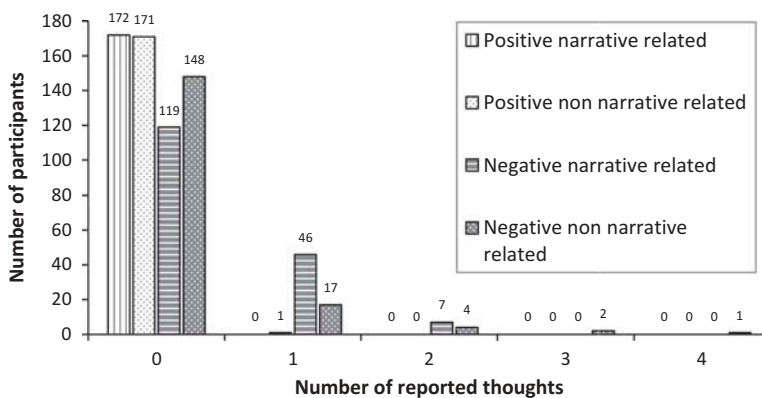
significantly more anti-BD at  $T_1$  than at  $T_0$ . The intention to engage in BD was not significantly different at  $T_1$  compared to  $T_0$ . Information about correlations between the changes in BD determinants is provided in Table 2.

On average, participants reported that they were fairly engaged in the narrative ( $M_{\text{attentional focus}} = 69.80$ ,  $SD = 20.83$ ;  $M_{\text{narrative understanding}} = 83.53$ ,  $SD = 14.99$ ,  $M_{\text{emotions and presence}} = 60.60$ ,  $SD = 16.59$ ).

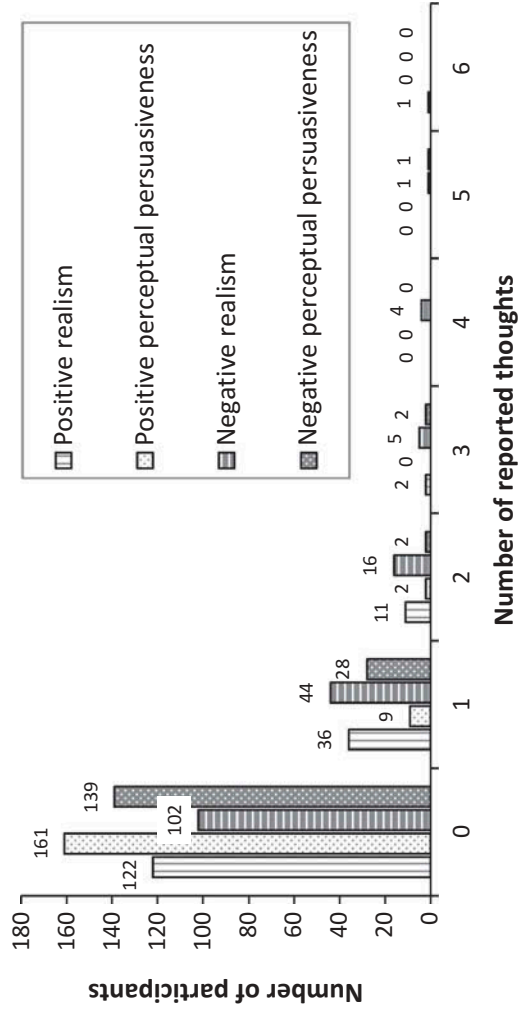
The mean number of boxes that were filled by participants with their thoughts was 7.05 ( $SD = 2.2$ ). As can be seen in Figure 2, the majority of participants reported either 0 or 1 thought that was coded as positively or negatively related to BD, and only 14 participants reported more than 1 thought coded as such. Therefore, before investigating whether positive and negative thoughts about BD mediate associations between narrative engagement dimensions and E-E impact (Hypotheses 2 and 3), we dichotomized these thoughts variables. This resulted in four dichotomous variables, each describing whether or not participants reported at least one positive (1) or negative (2) thought about narrative-related BD, or one positive (3) or negative (4) thought about nonnarrative-related BD.

As with thoughts about BD, the majority of participants reported either one or no thoughts that were coded as positively/negatively related to perceptual persuasiveness or realism (see Figure 3). Therefore, before testing Hypotheses 4a and 4b, we created four dichotomous variables, each describing whether or not participants reported at least one: negative (1) and/or positive (2) thought relating to perceptual persuasiveness, and negative (3) and/or positive (4) thought relating to realism.

Descriptive information about the dichotomized thought variables is displayed in Figure 4.

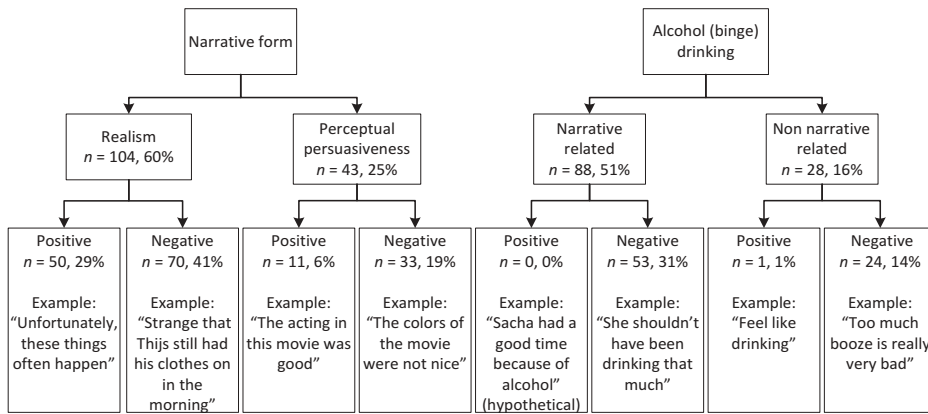


**FIGURE 2** Frequency of the number of reported thoughts about alcohol (binge) drinking by number of participants ( $N = 172$ ).



**FIGURE 3.** Frequency of the number of reported thoughts about the narrative form by number of participants ( $N = 172$ ).





**FIGURE 4** Number of participants and portion of the total number of participants ( $N = 172$ ) who reported one or more thoughts relevant for this study. (The numbers per category, e.g., realism, and valence, e.g., positive, do not add up to the total per category, because participants reporting neutral thoughts are not depicted here. Also, participants may have reported a positive as well as a negative thought in the same thought category).

## Main Analyses

In Hypothesis 1, we predicted that narrative engagement would be associated with a BD-discouraging impact. The results are presented in Table 3. As can be seen, emotions and presence was significantly associated with a BD-discouraging impact on negative outcome beliefs ( $b = -.24, p = .026$ , one-tailed tested). Also, emotions and presence was associated with a BD-discouraging impact on vulnerability beliefs ( $b = -.34, p = .0009$ , one-tailed tested). Attentional focus was associated with a BD-discouraging impact on severity beliefs ( $b = -.16, p = .005$ , one-tailed tested). None of the narrative engagement dimensions was associated with BD-discouraging impact on attitude toward BD. Attentional focus was significantly associated with changes in BD intention ( $b = -.18, p = .0095$ , one-tailed tested). None of the narrative engagement dimensions was associated with BD-discouraging impact on BD willingness. To summarize, support for Hypothesis 1—narrative engagement dimensions are associated with E-E impact—was found in the case of impact on negative outcome beliefs, vulnerability beliefs, severity beliefs, and BD intentions. No support for Hypothesis 1 was found in the case of impact on attitude toward BD and BD willingness.

Hypothesis 2 focused on testing whether positive thoughts about BD mediated associations between narrative engagement and BD-discouraging impact. As can be seen in Figure 2, only one participant reported an alcohol-related thought that was coded as positive. Therefore, Hypothesis 2 could not be tested.

Hypothesis 3 posed that negative thoughts about alcohol would partly mediate associations between emotions and presence and E-E impact. As can be seen in Table 3, no tested indirect effect of emotions and presence  $\rightarrow$  negative thoughts about alcohol  $\rightarrow$  changes in BD-related determinants (second column)

**TABLE 3** Analyses of Direct Effects of Narrative Engagement Dimensions on Changes in Binge Drinking-Related Determinants (Hypothesis 1). Analyses of Indirect Effects of Emotions and Presence on Changes in Binge Drinking-Related Determinants Through Negative Thoughts About Alcohol Binge Drinking (Hypothesis 3)

Direct effects (Hypothesis 1)		Indirect effects (Hypothesis 3)		
	<i>b</i>	estimate	One-tailed 95% CI	
Narrative understanding → negative outcome beliefs	-.03			
Attentional focus → negative outcome beliefs	.07			
Emotions and presence → negative outcome beliefs	-.24*	.01	.08	
Narrative understanding → vulnerability beliefs	-.03	-.01	.02	
Attentional focus → vulnerability beliefs	.14			
Emotions and presence → vulnerability beliefs	-.34***	.03	.14	
Narrative understanding → severity beliefs	-.01	-.01	.04	
Attentional focus → severity beliefs	-.16**			
Emotions and presence → severity beliefs	.07	-.02	.01	
Narrative understanding → attitude toward BD	-.04	.00	.05	
Attentional focus → attitude toward BD	-.01			
Emotions and presence → attitude toward BD	.06	-.02	.00	
Narrative understanding → BD intention	.10	.00	.02	
Attentional focus → BD intention	-.18**			
Emotions and presence → BD intention	.11	-.05	.00	
Narrative understanding → BD willingness	.24	.00	.06	
Attentional focus → BD willingness	-.05			
Emotions and presence → BD willingness	-.06	.04	.13	
		-.00	.03	

Note. BD = binge drinking. CI = confidence interval. Coefficients are unstandardized coefficients. Negative coefficients reflect a BD-discouraging impact. *p* values are one-tailed. \**p* < .05, \*\**p* < .01, \*\*\**p* < .001.

**TABLE 4** Regression Analyses of Narrative Engagement Dimensions on Thoughts About Perceptual Persuasiveness and Realism

	Narrative understanding	Attentional focus	Emotions and presence
Negative thoughts perceptual persuasiveness	1.73	-2.93	-10.18**
Positive thoughts perceptual persuasiveness	3.93	1.03	6.56
Negative thoughts realism	1.19	.54	-1.08
Positive thoughts realism	-1.80	-3.20	.78

*Note.* Coefficients are unstandardized coefficients; *p* values are one-tailed. Control variables are sex, age, and condition.\*\**p* < .01.

was significant, none yielding upper bound 95% confidence intervals below zero. Consequently, no support was found for Hypothesis 3.

We predicted that negative or positive thoughts about the narrative form would negatively or positively predict narrative engagement dimensions (Hypotheses 4a and 4b). In line with Hypothesis 4a, and as can be seen in Table 4, negative thoughts about perceptual persuasiveness significantly and negatively predicted emotions and presence ( $b = -10.18, p = .005$ ). Whether or not participants reported negative realism thoughts was not associated with the degree to which they experienced emotions and presence. In contrast to Hypothesis 4b, whether or not participants produced positive thoughts about realism or perceptual persuasiveness did not predict any of the narrative engagement dimensions.

## DISCUSSION

Given that narrative engagement has been shown to play a role in narrative impact (Dunlop et al., 2010; McKinley, 2012), there is a strong need for insight into the mechanisms whereby narrative engagement leads to narrative impact. Therefore, the present study investigated how dimensions of narrative engagement related to different thought types that recipients produced in response to an E-E narrative, to produce E-E impact. The study was conducted within the context of an E-E narrative developed to discourage BD.

From the results, three main conclusions can be drawn. First, the E-E narrative employed has a BD-discouraging impact on almost all the BD determinants assessed in this study. Second, the narrative engagement dimensions of attentional focus, emotional engagement, and narrative presence are associated with some of this impact. There is no evidence indicating that negative thoughts about BD mediate these associations between narrative

engagement dimensions and E-E impact. Third, negative thoughts about perceptual persuasiveness are associated with lower emotional engagement and narrative presence.

The first main conclusion concerns the impact of the E-E narrative on BD. The results show that, after the participants had viewed the E-E narrative, most of the BD-related determinants were more anti-BD than prior to the viewing. Although many studies have shown that narratives can yield behavioral impact (e.g., Green & Brock, 2000), results of E-E narratives aimed at discouraging BD among young people are scarcely described (Shen & Han, 2014). This study has shown that E-E narratives can be an effective health communication strategy to target binge drinking in young people.

The second main conclusion relates to the role of narrative engagement in E-E impact. The results show that higher attentional focus is associated with a lowered intention to engage in BD and stronger severity beliefs. In addition, emotional engagement and narrative presence are associated with stronger negative outcome beliefs, as well as with stronger vulnerability beliefs. These findings are consistent with earlier studies (e.g., Green & Brock, 2000) showing that narrative engagement is associated with narrative impact. In contrast to our expectation, we found no evidence that negative thoughts about BD mediated associations between emotions and presence and E-E impact. This finding indicates that other processes may have been involved in how narrative engagement is associated with E-E impact.

The narrative engagement dimensions of emotional engagement and narrative presence may have impacted beliefs via an experiential pathway, rather than via a cognitive pathway. Perhaps emotional engagement and narrative presence induced recipients themselves to feel that they were also at risk of these negative consequences (Dunlop et al., 2010; Moyer-Gusé, 2008). This would indicate that it is not thoughts but rather feelings relating to negative consequences of unhealthy behavior that are important for E-E impact. The finding that emotional engagement and narrative presence are associated with beliefs but not with attitude, willingness, and intentions is in line with earlier research (De Graaf, Hoeken, Sanders, & Beentjes, 2009). Together, these results suggest that emotional engagement and narrative presence may be involved in changing beliefs closely related to the events portrayed in narratives, but not in changing behavioral determinants less directly linked to these events.

The narrative engagement dimension of attentional focus may have impacted the severity beliefs and intentions by increasing the likelihood of recipients extracting the implicit health-related message from the E-E narrative. High attentional focus may indicate that recipients (choose to) allocate mental resources to processing the E-E narrative, including the implicit message about BD embedded in the narrative events and the characters' experiences. Logically, recipients have to pay attention to these events and experiences in order to extract the message embedded in them (Lang,

2000). Future research may provide further insight into whether attentional focus on E-E narratives enhances health-message extraction.

The third main conclusion concerns the association between thoughts about the narrative form and the narrative engagement dimensions. We found that negative thoughts about perceptual persuasiveness were negatively associated with emotional engagement and narrative presence. This result confirms the results of a recent study showing that perceptual persuasiveness is associated positively with emotional engagement (Cho et al., 2014). Possibly, low perceptual persuasiveness raises a barrier against recipients entering the story world and experiencing a sense of closeness to the narrative world and characters.

No associations between thoughts about realism and the narrative engagement dimensions were found in our study. This result may seem to be at odds with the results of earlier studies (Bilandzic & Busselle, 2011; Cho et al., 2014), which found that realism is associated with narrative engagement. However, in these studies, the overall experience of realism was assessed using a self-report scale. In our study, thoughts generated about realism during viewing were assessed. Apart from differences in measurement methods, the contrast in findings may be explained by perceived realism possibly being associated with narrative engagement directly, through facilitating recipients' ability to project themselves into the narrative. This association between perceived realism and narrative engagement may not be dependent on whether or not recipients produce spontaneous positive or negative thoughts about realism while viewing. Future research could focus on exploring the different pathways from perceived realism to narrative engagement by, for example, exploring whether or not thoughts about realism mediate the association between perceived realism and narrative engagement.

### Limitations

Our study has some limitations. First, its focus was to elucidate the complex interplay of how recipients think in response to, and engage with, E-E narratives while being exposed to such narratives. The posttest measurement directly followed exposure to the E-E narrative. Therefore, we do not know how long the found impact lasted, whether the E-E narrative changed actual BD behavior, and whether narrative engagement and thoughts that arose while the recipients were viewing also played a role in possible long-term E-E impact. Also, we do not know to what extent recipients continued to think about the E-E narrative after exposure and whether such thoughts are involved in long-term E-E impact. Which processes are involved in long-term E-E impact is an important followup question that could be answered in future studies employing a followup measurement.

Second, to investigate the thoughts produced in response to the E-E narrative, we asked participants to list the thoughts they remembered having while viewing the E-E narrative. Research has shown that, with retrospective thought listing, valid data can be obtained of an individual's thoughts during an effortful activity (Petty, Wells, & Brock, 1976, cited in Cacioppo et al., 1997), such as narrative engagement. However, we cannot be certain that the participants reported all the thoughts they had while viewing. Only thoughts produced at the end of the E-E narrative or the most prominent thoughts may have been reported because these thoughts may have been remembered better. Thus, a disadvantage of retrospective thought listing is that it may not capture all the thoughts produced during the viewing session. This suggests that thought listing by participants while they are viewing may be a more reliable measure. However, such thought listing may interfere with narrative engagement, because listing thoughts requires effort and may distract participants from following the E-E narrative. Although establishing what measure is most valid seems to be difficult, future research may want to compare how thoughts reported after viewing relate to narrative engagement and E-E impact as compared to thoughts reported during viewing.

Third, the reliability coefficients of this study's severity and willingness measures were relatively low. This may have arisen because items were translated from English to Dutch by simple translation, thereby possibly capturing somewhat different constructs than the intended constructs. Also, it may be a characteristic of the measures. For example, in a study by Gerrard, Gibbons, Stock, Lune, and Cleveland (2005), the items to assess willingness to smoke also yielded a relatively low Cronbach's alpha of .65. Some may find the reliability of scales with Cronbach's alphas between .6 and .7 questionable (e.g., George & Mallery, 2003). Others, however, find that Cronbach's alphas below .7 are acceptable and can be expected when psychological constructs are being measured (Kline, 1999). Given that our study measures mainly psychological constructs and that relatively low Cronbach's alphas have been found previously, we did not exclude these measures from our study.

Fourth, multiple hypotheses were tested in this study and significant associations may, therefore, be significant by chance. Indeed, we did not correct to control for this Type I error. Not controlling for Type 1 error is common in exploratory studies (McDonald, 2014), such as our study, which is just a first step toward understanding better how narrative engagement dimensions and thoughts are associated with E-E impact. In this stage, we therefore preferred the possibility of falsely identifying a significant association over missing out on a potentially important discovery. Nonetheless, we checked for false positive results with the Benjamini–Hochberg (BH) false discovery rate (FDR) procedure (Benjamini & Hochberg, 1995), with a false discovery rate of 0.10. By this procedure, we generated critical values for each test to which we compared each of the found  $p$  values. When the found  $p$  value is below this

BH critical value, it can be concluded that this test is indeed significant at a 10% false discovery rate. This procedure indicated that only the association found between emotions and presence and changes in negative outcome beliefs may have been a false positive association.

Fifth, in response to the selected E-E narrative, only one participant reported a positive thought about BD. This implies that the E-E narrative convincingly showed the negative consequences of BD, even to participants who were positive about BD before exposure to the E-E narrative. Although this is a desired effect from the perspective of health promotion, this result made it impossible to test the hypotheses that narrative engagement dimensions are associated with reduced positive thoughts about BD, and that these thoughts negatively associate with E-E impact on discouraging BD.

Last, the study was conducted in a forced exposure context. Participants may have stayed focused on the E-E narrative because watching the narrative was part of a study in which they had agreed to participate. Because the posttest questions were unknown to them during the viewing, they may have paid attention to the narrative to be able to answer any questions that might be asked. Consequently, this viewing situation does not exactly mirror viewing situations in real-life settings.

Despite these limitations, the results of our study can inform E-E developers who aim to design engaging and health-promoting narratives.

### Practical Implications for E-E Development

The study results demonstrated that the selected 12-minute audiovisual E-E narrative was able to yield an immediate BD-discouraging impact. This implies that relatively short audiovisual E-E narratives may be a powerful tool for health organizations to encourage healthy behaviors.

The results of this study have practical implications for the development of impactful E-E narratives. Because emotional engagement, narrative presence, and attentional focus are shown to be associated with E-E impact, these dimensions of narrative engagement should be maximized. To maximize emotional engagement, E-E developers may incorporate highly emotional content in their E-E narratives. In the case of a negative role model, E-E narratives should portray life-changing consequences of the character's involvement in the unhealthy behavior and show that these consequences strongly impact the character's emotions (Appel & Richter, 2010). Second, E-E developers should aim to maximize the perceptual persuasiveness of E-E narratives, because negative thoughts about perceptual persuasiveness interfere with emotional engagement and narrative presence. To maximize perceptual persuasiveness, E-E developers should collaborate with a professional production company to produce a narrative format that connects to target recipients' media preferences (e.g., genre, look, and feel). In addition, as a pretest, E-E

developers may want to collect the target recipients' thoughts about perceptual persuasiveness in an early phase of E-E development to gain insight into, and resolve issues relating to, perceptual persuasiveness. Another way to ensure perceptual persuasiveness may be to incorporate a health message in an existing media format that is already perceived as perceptually persuasive by target recipients (*E-E inscript participation*; Bouman, 2002).

## CONCLUSION

To our knowledge, this is the first study to investigate how different types of thoughts in response to E-E narratives—such as about the narrative form and about the target behavior—relate to narrative engagement dimensions and to E-E impact. We expected that thoughts about risky behavior, in this case binge drinking, would play an important role in how narrative engagement is associated with E-E impact. We conclude that, in this study, the narrative engagement dimensions of attentional focus, emotional engagement, and narrative presence were important for E-E impact on BD, but that negative thoughts about BD did not play a role therein. This study, however, is the first step toward understanding the role of narrative engagement and thoughts in E-E impact by taking into account different relationships between narrative engagement dimensions and different thought types. Therefore, this study should be replicated to gain confidence in the presence or absence of relations among narrative engagement dimensions, thought types, and E-E impact.

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