

Argument Strength and the Persuasiveness of Stories

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Abstract

Stories are a powerful means to change people's attitudes and beliefs. The aim of the current work was to shed light on the role of argument strength (argument quality) in narrative persuasion. The present study examined the influence of strong versus weak arguments on attitudes in a low or high narrative context. Moreover, baseline attitudes, interindividual differences in working memory capacity, and recipients' transportation were examined. Stories with strong arguments were more persuasive than stories with weak arguments. This main effect was qualified by a two-way interaction with baseline attitude, revealing that argument strength had a greater impact on individuals who initially were particularly doubtful towards the story claim. Furthermore, we identified a three-way interaction, which showed that argument strength mattered most for recipients who were deeply transported into the story world in stories that followed a typical narrative structure. These findings provide an important specification of narrative persuasion theory.

Keywords: Narrative, Argument Strength, Argument Quality, Narrativity, Transportation, Working Memory, Persuasion

Argument Strength and the Persuasiveness of Stories

Since ancient times, religious leaders, politicians, and marketers have relied on stories to change people's attitudes, beliefs, and behavior (Gottschall, 2012). Empirical research has repeatedly demonstrated the power of narratives to persuade recipients – even if the stories were introduced as being fictional (e.g., Appel & Mara, 2013; Green & Brock, 2000; Prentice, Gerrig & Bailis, 1997). Narratives often engage the recipient and transport him or her into the world of the story (*transportation*, Gerrig, 1993; Green & Brock, 2000). This state of transportation, rather than the elaboration of arguments (cf., Petty & Cacioppo, 1986), is considered to play a key role in narrative persuasion. In contrast to theory and research on non-narrative communication (Chaiken, 1980; Petty & Cacioppo, 1986), narrative transportation theory suggests that argument strength plays a minor role in narrative persuasion (e.g., Green & Brock, 2002; Slater, 2002). One of the possible causes put forward to explain the minor role of argument strength is that when transported into a story, recipients lack sufficient working memory resources to scrutinize arguments. To test this assumption, the aim of the present study was to examine the role of argument strength in narrative persuasion. Extending prior studies in the field, we manipulated the strength of the arguments included in the story as well as the narrativity of the story. We also measured baseline attitudes and the levels of self-reported narrative transportation. Moreover, we examined whether individual differences in recipients' working memory capacity affected the role of argument strength in narrative persuasion.

Transportation Into Story Worlds, Narrativity, and Argument Strength

Stories or narratives (both terms are used interchangeably in this work) are defined as “the representation of an event or a series of events” (Abbott, 2002, p. 12). Stories entail

the actions and experiences of one or more protagonists and a plot line with certain schematic elements (e.g., setting, event, attempt, reaction, and consequence; Rumelhart, 1975). In recent years, empirical research has demonstrated that fictional as well as non-fictional narratives can have a pervasive impact on attitudes and beliefs about real-world issues (narrative persuasion, e.g., Green & Brock, 2000; Prentice, Gerrig & Bailis, 1997), on knowledge and memory (Fazio & Marsh, 2008; Marsh, Meade, & Roediger, 2003), and on social abilities and personality (Fong, Mullin, & Mar, 2013; Mar & Oatley, 2008). In some of these studies, the stories as a whole or their main narrative arc suggested a particular stance towards a topic (e.g., a story about a psychiatric patient who murdered a child led recipients to have more negative beliefs about the group of psychiatric patients, Green & Brock, 2000). In other studies, the stories included assertions which were not a key element of the plot (e.g., Appel & Richter, 2007; Dahlstrom, 2010; 2012; Prentice et al., 1997). Prior research indicates that the persuasive influence of narratives can be quite durable, being strong even after two weeks (Appel & Richter, 2007).

The potency of stories to change a recipient's worldview and his or her attitudes has been attributed to the situational state of being transported into the story world (*transportation*, Gerrig, 1993; Green & Brock, 2000; *narrative engagement*, Busselle & Bilandzic, 2008; 2009). The term transportation is based on the metaphor that recipients undertake a mental journey when reading a book or watching a movie. After this journey, they return to real life somewhat changed by the story events. When highly transported, "all mental systems and capacities become focused on the events occurring in the narrative" (Green & Brock, 2000, p. 701). The resulting mental state has been conceptualized as a co-activation of attention, imagery, and emotion (e.g., Green, 2004; Green & Brock, 2000).

Whether or not and how deeply recipients are transported into a story world is a function of the story itself, the situation in which recipients encounter the story, and rather stable recipient dispositions (Dal Cin, Zanna, & Fong, 2004; Green, 2004; Green & Brock, 2002). Not all texts that qualify as narratives are equally likely to elicit transportation. Stories that are well-written and well-structured are more transporting (Green & Donahue, 2009). Transportation is encouraged by stories that are made with high craftsmanship and adhere to the narrative format (Green & Brock, 2002). Differences in these and related qualities and characteristics within the field of narrative have been subsumed under the concept of *narrativity*. Narrativity is a scalable feature, meaning that a text (defined broadly, including oral discourse and audiovisual media) can have a greater or lesser degree of narrativity (e.g., Fludernick, 2002). Well-written literary texts often include stylistic techniques such as metaphor or foregrounding (cf. Miall & Kuiken, 1994), and literary texts were found to be more transporting than prose developed for the purpose of an experiment (Green & Brock, 2000). Likewise, disrupting the text structure and thereby re-ordering the events (while keeping the content intact) leads to lower transportation scores (e.g., Wang & Calder, 2006; Gnambs, Appel, Schreiner, Richter, & Isberner, 2014). Little is known, however, about the influence of argument strength on transportation. Although it is conceivable that poor arguments embedded in a story might disrupt transportation, a study by Gnambs and colleagues (2014) which compared stories with weak vs. strong arguments did not find any evidence for such an effect of argument strength on transportation.

Several studies related rather stable individual difference measures to transportation, such as the need for affect (e.g., Appel & Richter, 2010; Appel, Gnambs, & Maio, 2012) or trait transportability (e.g., Dal Cin et al., 2004; Mazzocco, Green, Sasota, & Jones, 2010).

Moreover, studies examined whether baseline attitudes closely related to the beliefs advocated in the story predicted transportation. The results are somewhat inconclusive. Whereas Dal Cin and colleagues (2004) observed no relationship between baseline attitudes (measured weeks before encountering the story) and transportation, Green (2004) showed that having gay friends in real life predicted greater transportation into a story with a gay protagonist.

In sum, the structure and the craftsmanship of a story as well as personality variables are well-known predictors of transportation. Evidence is mixed regarding the initial attitudes about the topics dealt with in a story, and little is known about whether argument strength affects transportation.

Persuasion Through Narratives and Argument Strength

Theory suggests that the more strongly recipients are transported, the more they are persuaded by the story (Green & Brock, 2002). Indeed, a number of experiments demonstrated that higher scores on the post-exposure transportation scale (Green & Brock, 2000) were associated with a stronger persuasive impact of stories (e.g., Appel & Richter, 2010; Green, 2004; Green & Brock, 2000). In recent years, researchers have become particularly interested in the mechanisms and boundary conditions that are responsible for the persuasiveness of stories and the increased attitude change that seems to be caused by deeper transportation into the story world. One family of explanations revolves around emotional processes and the empathy or identification with a character (e.g., De Graaf, Hoeken, Sanders, & Beentjes, 2012; Hoeken & Sinkeldam, 2014).

A second family of explanations revolves around the cognitive processes underlying narrative persuasion which are particularly relevant with respect to the influence of

arguments within a story context: The allocation of attention to a text is a key component of transportation and a predictor of persuasive effects (Bezdek & Gerrig, 2016; Gerrig, 1993; Green & Brock, 2000; 2002). The more recipients are transported into the story world, the more their cognitive and emotional processing is focused on the story world and the less their processing is focused on the immediate surroundings (such as the room in which a story is read) or other information that is unconnected to the story (such as an upcoming sports event). As recently pointed out by Bezdek and Gerrig (2016), the self-report scales used to measure transportation (such as the Transportation Scale, Green & Brock, 2000) include items on attentional focus (e.g., “While I was reading the narrative, activity going on in the room was on my mind” - reverse coded; see also the narrative engagement scale by Busselle & Bilandzic, 2009, which includes an attentional focus subscale.)

Moreover, when transported into the story world, recipients build a representation that is rich in imagery. These vivid images of the story world are considered to be a key ingredient of story impact (Gerrig, 1993; Green & Brock, 2002; van Laer et al., 2014). With respect to the influence of strong versus weak arguments, attention and imagery likely facilitate the processing of arguments. Thus, for highly transported recipients, argument strength should matter more than for less transported recipients. In line with this reasoning, Quintero Johnson, Harrison, and Quick (2013) identified a positive relationship between transportation and self-reported systematic processing of a story that included health-related information.

Building intense imagery, however, could have a reverse effect on the influence of argument strength on narrative persuasion. Rich imagination likely consumes cognitive resources or working memory resources that are not available for competing simultaneous

cognitive tasks (Green & Brock, 2002). Thus, being transported into the story world is supposed to be incompatible with demanding cognitive-elaborative activities such as counterarguing (Busselle & Bilandzic, 2009; Dal Cin et al., 2004; Green & Brock, 2000; Slater & Rouner, 2002) which is known as a key obstacle to persuasive efforts (e.g., Brock, 1967; Petty & Cacioppo, 1986). Drawn into the story world, recipients might lack sufficient working memory resources to engage in a thorough analysis of the communication.

Moreover, if a tale is gripping and the experience is pleasant, the motivation for elaborative activities may be low (Green & Brock, 2002). From this perspective, the influence of argument strength on attitude change should be limited, given that recipients of stories lack the cognitive resources to scrutinize information included in a story. Tentative evidence in support of this hypothesis can be found in advertising research. Recipients who saw a print ad and imagined using the advertised product were less influenced by variations in argument strength than recipients who saw the print ad but did not imagine product use (Escalas, 2004; 2007; Lien & Chen, 2013; Praxmarer, 2011). Transferred to the effects of stories, these findings suggest that argument strength matters less when stories follow a typical story-structure or recipients are highly transported into the story world or both.

In sum, two competing assumptions regarding the influence of argument strength can be identified from the literature. However, these assumptions have yet to be tested directly.

Argument Strength and Research on Non-Narrative Texts

Theory and research on narrative persuasion is based on the assumption that the processing and the effects of narratives differ in key regards from the processing of non-narrative texts (e.g., Appel & Richter, 2007; Gerrig, 1993; Green & Brock, 2000; Green &

Brock 2002; Slater, 2002). Nonetheless classical persuasion research, that often relied on dual process models like the elaboration likelihood model (ELM, Petty & Cacioppo, 1986) or the heuristic systematic model (HSM, Chaiken, 1980), constitutes an important background for explorations on argument strength. Both models propose that the extent to which arguments are processed varies from not really elaborating on the arguments' validity (in favor of peripheral cues such as characteristics of the message source) to entirely elaborating on it.

If the recipient has both the motivation and the ability to process the information thoroughly (high elaboration likelihood) strong arguments are more persuasive than weak arguments. Occasionally, counter-message or boomerang effects have been observed when weak arguments were presented (e.g., Park et al., 2007), in the sense that weak arguments led to persuasive effects contrary to the claims when elaboration likelihood was high. Factors that influence an individual's ability (such as the speed at which assertions are presented, Smith & Shaffer, 1995) or the motivation to engage in elaboration (such as the personal relevance of a topic, cf., Johnson & Eagly, 1989) in turn affect the likelihood that strong arguments yield higher persuasion than weak arguments (cf. Carpenter, 2015; Petty & Wegener, 1998). Moreover, the influence of argument strength was found to vary with the disparity between recipients' pre-exposure attitudes and the stance implied by the message. The more negative the pre-exposure attitude with respect to an advocated position, the more influential were manipulations of strong vs. weak arguments (Johnson, Smith-McLallen, Killeya, & Levin, 2004). Regarding general interindividual differences, the need for cognition was identified as a trait indicating high motivation to elaborate (Cacioppo & Petty, 1982). Supporting the assumption of different processes underlying the

persuasion through narrative vs. non-narrative texts, no consistent influence of the need for cognition was found for recipients' transportation into the story world (Green & Brock, 2000; Appel & Maleckar, 2012) or the persuasive impact of narratives (Appel & Richter, 2007; Green & Brock, 2000; Wheeler, Green, & Brock, 1999). Regarding the ability to elaborate, it has been suggested that working memory capacity might moderate the influence of argument strength within a persuasion framework (Barrett, Tugade, & Engle, 2004). Elaboration requires cognitive resources and controlled processing. Thus, individuals lower in working memory capacity may not be able to effectively suppress non-relevant information while focusing on and deliberately elaborating the content of a presented persuasive message. Individuals low in working memory capacity are more vulnerable to interference effects, which results in weaker performance in secondary tasks compared to individuals high in working memory capacity (e.g., Conway, Cowan, & Bunting, 2001; Kane & Engle, 2000; Rosen & Engle, 1998). However, an extensive literature research did not yield any studies in which working memory capacity was empirically related to argument strength in the context of persuasion, neither for non-narrative nor for narrative texts.

Study Overview

Much of the available theoretical work on narrative persuasion suggests that the role that argument strength plays in narrative persuasion is smaller than the role argument strength plays in non-narrative persuasion (e.g., Green & Brock, 2002; Slater, 2002, see also Appel & Richter, 2007). To date, empirical research on the exact influence of strong versus weak arguments embedded in stories is missing. This work was meant to address this lacuna. The present study examined the influence of strong versus weak arguments in a

low or high narrative context. In addition to post-exposure attitudes, baseline attitudes, working memory capacity, and recipients' transportation were examined.

Our first aim was to examine the role of argument strength in stimulus texts that vary in narrativity. In our experiment, we manipulated argument strength by including claims in stories which were backed by strong or weak arguments. To examine whether the narrativity of the text influenced the processing and effects of arguments of varying strength, identical arguments were embedded in stories with low or high narrativity. To guarantee that the narrativity manipulation did not affect the content of the texts and thereby influence argument strength, identical content was presented with intact vs. disrupted narrative structure (Wang & Calder, 2006). We expected that transportation would be influenced by story narrativity. We were more reluctant to assume an effect of argument strength on transportation, given the paucity of prior research and even one study that did not find this effect (Gnambs et al., 2014). Thus, we addressed this potential influence as a research question.

Working memory capacity could be a key factor that determines to what extent argument strength affects persuasion. It is assumed that transported recipients lack working memory resources to engage in cognitive operations that yield a resistance to attitude change (e.g., counterarguing). Given that individuals differ in working memory capacity as a trait (Engle, 2002), our aim was to examine the influence of individual differences in working memory capacity on narrative persuasion under different conditions of narrativity and argument strength. We tested the assumption that the influence of argument strength would increase with higher working memory capacity, particularly if a story's narrativity is high. The independent manipulation of argument strength and narrativity allowed us to

investigate the relationship between transportation and attitude change given high or low narrativity, and weak or strong arguments.

Finally, the majority of previous studies in the field examined attitudes after exposure to a story without pre-exposure assessment. Attitude change is inferred if participants' post-exposure attitudes in the experimental conditions differ. This procedure does not allow examining how story features might interact with pre-existing attitudes. Argument strength, narrativity, or both might be particularly influential if a story message is in contrast to the recipients' attitudes towards the topic. To test this prediction, attitudes were measured one week before and immediately after story exposure.

Including several predictors into an experimental design and examining interactions provides intriguing insights on the boundary conditions of narrative persuasion. However, this endeavor can only be accomplished if statistical power is sufficient. To this end, a repeated measures design was implemented. Using several stories, arguments, and attitudes further increased the generalizability of the expected findings (each participant received four texts on four different topics; see method section below). The assignment of texts to experimental conditions as well as the order in which the conditions were presented was completely counterbalanced to control for topic and order effects.

Method

Argument Strength Pilot Study

Our arguments consisted of a claim or statement and three reasons that supported the claim (Shaw, 1996; Toulmin, 1958). The aim of our pilot study was to identify three weak and three strong reasons for each of four claims that were selected because they were not widely accepted by our participants (see below). The claims were (1) that cloning of

plants is beneficial, (2) that eating salad is less healthy than people think, (3) that tuition fees yield positive consequences for students, and (4) that thick fruit beverages (smoothies) are unhealthy. For each claim, we created six reasons that we expected to be judged as rather weak and six reasons expected to be judged as rather strong. We instructed the participants of the pilot study to indicate how suitable each reason was to convince a friend to agree to the claim and to provide their judgments on a 7-point scale with higher scores indicating stronger arguments. The participants were undergraduates; 127 students rated arguments for three of the topics, 156 students rated arguments for the fourth topic.¹ Argument strength ratings ranged from 1.66 to 3.87 ($M = 2.97$, $SD = 1.64$) for the weak reasons and from 3.93 to 6.34 ($M = 4.89$, $SD = 1.77$) for the strong reasons. As we wanted to include three reasons in each story, we chose the three reasons rated as least convincing and the three reasons rated as most convincing for each topic. The differences between the average ratings of the three weak and the three strong arguments were large and statistically significant. Paired t-tests revealed a significant effect for all four topics: tuition fees: $t(126) = 9.46$, $p < .001$, $d = 1.29$; cloning: $t(126) = 6.13$, $p < .001$, $d = 1.03$; smoothies: $t(155) = 15.01$, $p < .001$, $d = 3.05$; salad $t(126) = 15.79$, $p < .001$, $d = 2.37$ (pooled means $M = 2.20$, $SD = 1.49$ for the weak reasons and $M = 5.23$, $SD = 1.67$ for the strong reasons).

Participants

¹ In the pilot sample of 127 undergraduates (78 females), we also assessed the agreement to the four claims included in the experiment proper. On a 7-point scale (1 = *completely disagree with the claim*, 7 = *fully agree with the claim*), the mean endorsement ranged from 2.38 to 4.51. This indicated that the claims were not extremely popular, leaving a potential for belief change in our main study.

In our main study, 82 undergraduates (65 women) from the University of Koblenz-Landau (Germany) participated for partial course credit. The experiment was run in a lab and consisted of two sessions. The participants' age ranged from 19 to 43 years ($M = 23.66$ years; $SD = 3.56$).

Material

Stories and story manipulation. Each participant read four short stories (610-732 words) and each story included one belief-relevant topic. English translations of the original German stories are made available at <https://osf.io/n2qsh/>. The first story was about a young man lying in a hospital who fell in love with a woman over the Internet. The mysterious woman turned out to be his doctor. In this story, the protagonists exchanged arguments about the cloning of plants. The second story featured a young female journalist interviewing a famous opera singer who might have had an affair with the journalist's mother several months before the journalist was born. This story included a discussion of the (non-)benefits of eating salad. The third story dealt with a young woman and a young man who meet in a public park for a blind date and discuss tuition fees. The fourth story described a young couple on a road trip in which the woman seems to hide something that turns out to be a new tattoo. At a petrol station the protagonists overhear a discussion about the (non-)benefits of thick fruit beverages (smoothies).

Four versions of each story were developed. The versions differed with regard to the narrativity of the text (narrativity high vs. low) and the strength of the arguments (argument strength high vs. low) included in the story, following a two-factorial design. Each story consisted of five paragraphs and incorporated one paragraph in which a character made a claim supported by three reasons. In the high narrativity condition, the stories had a

smooth, linear, chronological flow, whereas in the low narrativity condition, the elements of the stories were scrambled to disrupt the plot line without making it incomprehensible. The paragraph that contained the belief-relevant topic always remained at the same position, which was the fourth of five paragraphs. This method was successfully employed in previous studies to manipulate transportation (e.g., Appel, Gnambs, Richter, & Green, 2015; Voss, Wiley, & Sandak, 1999; Wang & Calder, 2006). In addition, the texts varied with respect to the strength of the three reasons which supported the statement. Thus, the arguments, pre-tested in the pilot study reported above, were either high in argument strength or low in argument strength. All text versions within and across topics were comparable in writing style, length (number of sentences: story 1: 65-67, story 2: 59, story 3: 57-58, story 4: 50-51; words: story 1: 703-737, Story 2: 773-787, story 3: 613-622, story 4: 701-717) and difficulty as operationalized by Flesch's Reading Ease Index (55-59; cf. Amstad, 1978; Flesh, 1948).

Assessment of working memory capacity. The reading span task (RST; Daneman & Carpenter, 1980; Oberauer, Süß, Schulze, Wilhelm, & Wittmann, 2000) served as the measure of working memory capacity. The reading span task required the participants to read 84 unconnected sentences presented in blocks. For each sentence, the participants had five seconds to decide if it was true or false. Additionally, they had to memorize the last word of each sentence. The number of sentences presented per block was incrementally increased from three to seven. After each block, the participants had to recall the end-of-the-sentence words of the block. Items were only counted as correct if the right word was remembered at the right position within the specific block. The true or false judgment was not analyzed in the end, but the participants were made to believe that it was an important

part of the task. This prevented the participants from adopting a strategy that focused on the final words without devoting much attention to the reading of the sentence. It has been shown (Daneman & Carpenter, 1980) that the RST is especially suitable to measure working memory as related to reading abilities because it requires text processing and storing. The reading span task was scored as recommended by Friedman and Miyake (2005) by averaging the proportion of correct words per block across all blocks.

Transportation. The state of being transported into a narrative world was measured with the six items of the Transportation Scale - Short Form (TS-SF, Appel et al., 2015). The TS-SF exhibits levels of reliability comparable to the original Transportation Scale and has been validated in a series of studies (cf. Appel et al., 2015). The six self-report items (with 7-point response scales, ranging from 1 to 7) describe the cognitive, emotional and imagery involvement in a narrative (e.g. “I could picture myself in the scene of the events described in the narrative” or “The narrative affected me emotionally”). Cronbach’s α ranged between .74 and .92, indicating high internal consistency of the measure regarding all story versions.

Attitude measures. For each of the topics addressed by the statements, participants answered five attitude items (e.g., “The cloning of plants has significant positive effects”, “There should be more information about the negative consequences of smoothies”), yielding 20 attitude items altogether. A 7-point rating scale was provided (1 = *disagree completely* and 7 = *agree completely*). The responses were recoded so that high scores represent attitudes in line with the arguments included in the story.

Additional measures. Our experiment further included a thought listing task and a Pinocchio circling task (cf. Green & Brock, 2000). The thought listing took place after the transportation and attitude items regarding a text were administered, shortly before the

participants read the next story. The Pinocchio circling task was introduced at the very end of the experiment after participants had read all four stories and after all dependent variables were assessed. To ensure that the participants only focused on the part of the story that contained the arguments in their responses, we changed the traditional instructions of the thought listing and the Pinocchio circling tasks (Cacioppo & Petty, 1981; Green & Brock, 2000). The results suggest that these instructions were misspecified, as the majority of the participants did not follow the instructions as expected. We included one additional item that asked about future behaviors as a potential additional outcome. We had doubts about the reliability and validity of this measure and did not investigate further. Results regarding the three measures are not presented.

Procedure

All participants came to our lab twice with at least seven days between session one and session two ($M = 8.71$ days; $SD = 3.50$). In Session 1, we assessed participants' working memory capacity, operationalized by the reading span task. We further administered the attitude items to assess participants' pre-exposure baseline attitudes towards the topics. To disguise our research interest, these focal attitude items were mixed with 20 additional items about topics unrelated to our experimental treatment.

In Session 2, participants were seated in front of a computer where the study material was presented. They read four stories, each one representing a different combination of narrativity (high vs. low) and argument strength (high vs. low). The story-factor combinations for each participant were counterbalanced so that each participant read only one version of each story. Additionally, the order of the stories within all possible combinations was completely balanced, which resulted in 16 different versions to control

for position effects. Each of the 16 combinations was administered to at least five participants by random assignment.

After each story, the short form of the Transportation Scale was presented, followed by the attitude items about the topic involved in the story. Then participants continued reading the next story. At the end of the experiment, participants provided demographic information, and were thanked and debriefed.

Results

Means and standard deviations of baseline and post-exposure attitudes for all four experimental conditions are displayed in Table 1. In all four experimental conditions, recipients' attitudes shifted towards the message included in the story.

- Table 1 around here -

To identify factors that influence the magnitude of this persuasive effect, our main statistical approach were multilevel analyses (linear mixed models), which allowed us to account for the repeated measures design and for the fact that participants, topics, and attitude items were sampled from larger populations. Thus, our model included participants, topics, and items as random factors (random intercepts). Moreover, multilevel analyses allow examining main effects as well as interaction effects of continuous and categorical predictors located on different levels (participants and topics). The independent variables argument strength and narrativity were incorporated as contrast-coded predictors with fixed effects. The variables reading span, transportation, and baseline attitude were entered in the model as z -standardized predictors (fixed effects). To control for sequence effects, we also ran models that additionally included the position of the text (experimental condition) within the experiment (1, 2, 3, or 4) as grand-mean centered predictor and the interactions

of this predictor with all other predictors in the model. In the model with attitude as dependent variable, including text position as a predictor did not result in a significant increase in explanatory power ($\chi^2(8) = 13.91, p = .08$). In the model with transportation as dependent variable, text position did contribute significantly to the explanatory power of the model ($\chi^2(4) = 164.73, p < .001$). This was due to a significant negative main effect of text position ($t = -13.02, p < .001$) which indicated that participants were less transported into texts they read later. Importantly, however, these analyses suggest that the pattern of hypothesis-relevant effects was not significantly affected by text position. In the interest of parsimony of the estimated models and conciseness of presentation, we will only refer to the models without text position here. The analyses were conducted with the packages *lme4* (Bates et al., 2014) and *lmerTest* (Kuznetsova, Brockhoff, & Christensen, 2014). All packages are part of the R environment for statistical computing and graphics (R Development Core Team, 2015). All significance tests were based on a type I error probability of .05.

Transportation as Dependent Variable

Our first multilevel analysis focused on recipients' experience of transportation as the criterion with participants and topics as random factors. The results of this analysis are displayed in Table 2.

- Table 2 around here -

It was expected that transportation scores should be higher in high-narrative stories. There was indeed a significant main effect of narrativity (Cohen's $d = 0.44$): Transportation scores were higher in high-narrative stories ($M = 4.71, SE_M = .25$) compared to low-narrative stories ($M = 4.14, SE_M = .25$). Neither the main effects for argument strength nor

baseline attitude reached significance. However, the interaction between narrativity and argument strength was significant. In stories with low narrativity, transportation scores were higher if the story contained strong arguments ($M = 4.26$, $SE_M = .25$) compared to weak arguments ($M = 4.02$, $SE_M = .25$), $t(1545) = 4.53$, $p < .001$, $d = 0.19$. In the high narrativity condition, transportation scores were higher if the story contained weak arguments ($M = 4.83$, $SE_M = .25$) compared to strong arguments ($M = 4.59$, $SE_M = .25$), $t(1545) = -4.67$, $p < .001$, $d = 0.19$. All other interactions failed to reach significance. The main effect of reading span approached significance, suggesting that the higher the trait reading span scores, the higher the transportation ratings. Reading span did not moderate the main effect of narrativity or the interaction between narrativity and argument strength.

Attitudes as Dependent Variable

Our second multilevel analysis focused on recipients' post-exposure attitudes as the criterion with participants, topics, and items as random factors. The results of this analysis are displayed in Table 3.

- Table 3 around here -

There were two significant main effects: First, the main effect of baseline attitude was significant. Not surprisingly, pre- and post-exposure attitudes were positively related. Second, we found a small but significant main effect of argument strength ($d = 0.12$): Strong arguments led to attitude scores more in line with the story's message ($M = 3.74$, $SE_M = .37$) compared to weak arguments ($M = 3.51$, $SE_M = .37$).

- Figure 1 around here -

The main effects of argument strength and baseline attitude were qualified by a two-way interaction between both variables (Figure 1): Baseline attitudes were a stronger

predictor of post-exposure attitudes when stories of low rather than high argument strength were presented (simple slope for low argument strength: $B = 0.35$, $SE_B = 0.06$; $t(1609) = 6.21$, $p < .001$; simple slope for high argument strength: $B = 0.16$, $SE_B = 0.06$; $t(1593) = 2.95$, $p = .003$). From an argument strength perspective, the interaction shows that argument strength matters most for individuals who were initially more skeptical towards the story message (simple main effect for a baseline attitude two standard deviations below the mean: $B = 0.30$, $SE_B = 0.08$; $t(1600) = 3.79$, $p < .001$; simple main effect for a baseline attitude two standard deviations above the mean: $B = -0.07$, $SE_B = 0.08$; $t(1602) = -0.87$, $p = .39$). The effect of argument strength was further qualified by a three-way interaction with narrativity and transportation (Figure 2). Argument strength mattered most in the high narrativity condition, provided that individuals were transported into the story world. Simple slope analyses showed that if the story was high in argument strength and high in narrativity, the extent to which participants were transported into the story world had a positive influence on post-exposure attitudes ($B = 0.18$, $SE_B = 0.09$; $t(1072) = 2.10$, $p = .04$), whereas there was no significant relationship between transportation and attitude in the other groups (for all effects: $|t| < 1.30$, $p > .19$).

- Figure 2 around here -

All other effects on attitude change were non-significant. This includes the effects of working memory capacity, which appeared to be unrelated to the narrative effects. Thus, we found no support for a more pronounced effect of argument strength with increasing working memory capacity under any of the story narrativity conditions.

Discussion

Individuals often read, watch, and listen to stories purely for pleasure and entertainment (cf. Nell, 1988), but these stories can have substantial consequences on recipients' attitudes and beliefs (narrative persuasion, Green & Brock, 2000; van Laer et al., 2014). The persuasive power of stories has been harnessed to change attitudes and behavior in various applied contexts, including health communication (e.g., Hinyard & Kreuter, 2007; Murphy, Frank, Chatterjee, & Baezconde-Garbanati, 2013), political communication (e.g., LaMarree & Landreville, 2009; Paluck, 2012), and product advertising (Petrova & Cialdini, 2008; Phillips & McQuarrie, 2010).

In this work, we had a closer look at the role of argument strength in narrative persuasion. Whereas argument strength is a key factor in classic persuasion theories (Chaiken, 1980; Petty & Cacioppo, 1986), little is known about its influence in narrative persuasion. To address this research lacuna, a repeated measures experiment was conducted in which argument strength and narrativity were manipulated. Post-exposure attitudes served as the dependent variable, and the design further included an assessment of working memory capacity, baseline attitudes, and transportation.

We found that in all four experimental conditions, attitudes shifted in the direction of the story's message. Stories with strong arguments, however, were more persuasive than stories with weak arguments. This main effect was qualified by a two-way interaction with baseline attitudes, indicating that argument strength mattered most among individuals who were particularly skeptical towards the story claim before they read the story. We further identified a three-way interaction of argument strength, narrativity, and transportation: Provided that a story had an intact story structure (high narrativity), argument strength mattered most for recipients who were deeply transported into the story world – only when

transportation was high, strong arguments were more persuasive than weak arguments. When the story structure was disrupted (as in our operationalization of low narrativity), transportation was unrelated to persuasive effects. On the one hand, this finding is in line with transportation theory which posits that transportation can explain narrative effects in stories but not in non-story formats. It is also in line with the notion that attention is an integral part of transportation (Bezdek & Gerrig, 2016; Green & Brock, 2000) and a study that revealed a positive link between transportation and self-reported systematic message processing (Quintero-Johnson et al., 2013). On the other hand, this finding appears to be at odds with basic theoretical work on narrative persuasion. Van Laer and colleagues, for example, summarize prior theory stating that “narrative transportation is a mental state that produces enduring persuasive effects without careful evaluation of arguments” (Van Laer et al., 2014, p. 800).

In contrast to some theoretical notions, our findings show that argument strength can be a factor in narrative persuasion. Our research, however, also demonstrates that even weak arguments included in a story can change recipients’ attitudes. Thus, stories can persuade in the absence of strong arguments (cf. Gerrig & Prentice, 1991; Green & Brock, 2002), but argument strength contributes to larger attitude change. These findings were not qualified by recipients’ working memory capacity, suggesting that story effects are not restricted to those who lack mental resources.

Limitations and Future Research

The stories examined in this study included persuasive content that was not a key element of the plot. Similar stories were used in a number of studies in the field (e.g., Appel & Richter, 2007; Dahlstrom, 2010; 2012; Fazio, Dolan, & Marsh, 2015; Gerrig & Prentice,

1991; Prentice et al., 1997). We deliberately followed this practice as our goal was an independent manipulation of argument strength and narrativity. An alternative method for manipulating argument strength in stories might be to manipulate the severity of the consequences (e.g., minor illness vs. death) of a given target behavior (e.g., getting vaccinated) that is closely connected to an attitude (e.g., attitude towards getting vaccinated). Future studies are encouraged to explore this alternative operationalization.

Second, we opted for a repeated measures design and we conducted multilevel analyses as our main statistical tool. The design allowed us to examine predictors on the person, the text, and the item level while preserving sufficient power. To reduce unwanted influences of carry-over effects, the stories were presented in counterbalanced order and the pre-exposure attitudes were assessed along with filler items at least seven days prior to the main experimental session. Essentially, the counterbalancing of the order of experimental conditions rules out a systematic influence of story position (e.g., reading the first story vs. a later story) on our results. Nonetheless, we conducted additional analyses controlling for potential effects of text position. These analyses showed that transportation decreased with text position, but the pattern of our key results remained unaffected. We believe that future replications based on a complementary between-subjects design (including a reduced set of predictors) could provide an important corroboration of the present results.

Third, we investigated crucial factors and boundary conditions of narrative persuasion, but did not directly measure the psychological processes underlying these effects. It is arguably one of the greatest challenges in the research on narrative influence to delineate processes during reception. In future studies, psychophysiological measures might be employed to examine online emotional reactions (Sukalla, Bilandzic, Bolls, & Busselle,

2015), and researchers can profit from methods used in text comprehension research to examine cognitive processes. Future studies are encouraged to assess reading times on information that might contradict participants' pre-exposure attitudes (individuals need more time to process information that is inconsistent with prior information or beliefs; e.g., Singer, 2006) or the re-reading of words and sentences (which is also more frequent for information perceived as implausible or inconsistent; e.g., Hyönä, Lorch, & Rinck, 2003). Ideally, studies could obtain several measures simultaneously (e.g., psychophysiological measures and eye-tracking measures such as re-reading) to tap into different components of recipients' transportation.

Conclusion

In contrast to the pivotal role of argument strength in non-narrative persuasion research, surprisingly little is known about the role that weak vs. strong arguments play in narrative persuasion. The current study shows that even weak arguments embedded in stories can persuade, but that argument strength increases the persuasive impact, particularly if recipients are initially rather skeptical towards an issue, and that argument strength matters most when individuals are deeply transported into a story of high narrativity. Thus, researchers and practitioners can expect the highest narrative impact if a good story contains strong arguments and recipients are deeply immersed into the story world.

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Table 1. Means and standard deviation of baseline and post-exposure attitudes sorted by experimental conditions.

	<i>Baseline attitudes</i>		<i>Post-exposure attitudes</i>		<i>Difference between baseline and post-exposure attitudes</i>	<i>Effect size</i>	<i>Significance</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>Cohen's d</i>	<i>p</i>
Argument strength low - Narrativity low	3.02	1.31	3.45	1.21	3.23	.36	<.001
Argument strength low - Narrativity high	2.92	1.15	3.45	1.17	4.42	.42	<.001
Argument strength high - Narrativity low	3.15	1.30	3.68	0.95	3.75	.49	<.001
Argument strength high - Narrativity high	3.26	1.38	3.86	1.05	3.90	.43	<.001

Table 2. Overview of the results of the multilevel analysis with transportation as the dependent variable.

Predictor	Estimate	SE	df	t	p
<i>Main effects</i>					
Narrativity ^a	0.29	0.02	1545	15.82	<.001
Argument Strength ^a	0.00	0.02	1545	-0.11	.92
Baseline Attitude ^b	0.02	0.02	1561	1.05	.30
Reading Span ^b	0.20	0.10	80	1.94	.06
<i>Two-way interactions</i>					
Narrativity x Argument Strength	-0.12	0.02	1545	-6.51	<.001
Narrativity x Baseline Attitude	0.00	0.02	1556	-0.15	.88
Argument Strength x Baseline Attitude	-0.01	0.02	1554	-0.41	.68
Narrativity x Reading Span	0.02	0.02	1545	1.33	.18
Argument Strength x Reading Span	-0.01	0.02	1545	-0.73	.46
<i>Three-way interactions</i>					
Narrativity x Argument Strength x Baseline Attitude	0.02	0.02	1559	0.84	.40
Narrativity x Argument Strength x Reading Span	0.03	0.02	1545	1.87	.06

Note. ^aContrast-coded (Narrativity: low = -1, high = 1; Argument Strength: low = -1, high = 1).

^bz-standardized.

Table 3. Overview of the results of the multilevel analysis with post-exposure attitudes as the dependent variable.

Predictor	Estimate	SE	df	t	p
<i>Main effects</i>					
Narrativity ^a	0.04	0.04	1601	0.96	.34
Argument Strength ^a	0.12	0.04	1537	3.24	.001
Transportation ^b	0.03	0.05	346	0.62	.53
Baseline Attitude ^b	0.26	0.04	1578	6.03	<.001
Reading Span ^b	0.02	0.05	79	0.30	.76
<i>Two-way interactions</i>					
Narrativity x Argument Strength	0.02	0.04	1553	0.64	.52
Narrativity x Transportation	0.02	0.04	1545	0.04	.97
Argument Strength x Transportation	0.07	0.04	1592	1.81	.07
Narrativity x Baseline Attitude	-0.01	0.04	1600	-0.16	.87
Argument Strength x Baseline Attitude	-0.09	0.04	1605	-2.59	.01
Narrativity x Reading Span	-0.00	0.04	1534	-0.08	.93
Argument Strength x Reading Span	0.04	0.04	1530	1.16	.25
<i>Three-way interactions</i>					
Narrativity x Argument Strength x Transportation	0.08	0.04	1591	2.10	.04
Narrativity x Argument Strength x Baseline Attitude	0.06	0.04	1588	1.70	.09
Narrativity x Argument Strength x Reading Span	-0.01	0.04	1530	-0.16	.87

Note. ^aContrast-coded (Narrativity: low = -1, high = 1; Argument Strength: low = -1, high = 1).

^bz-standardized.

Figures

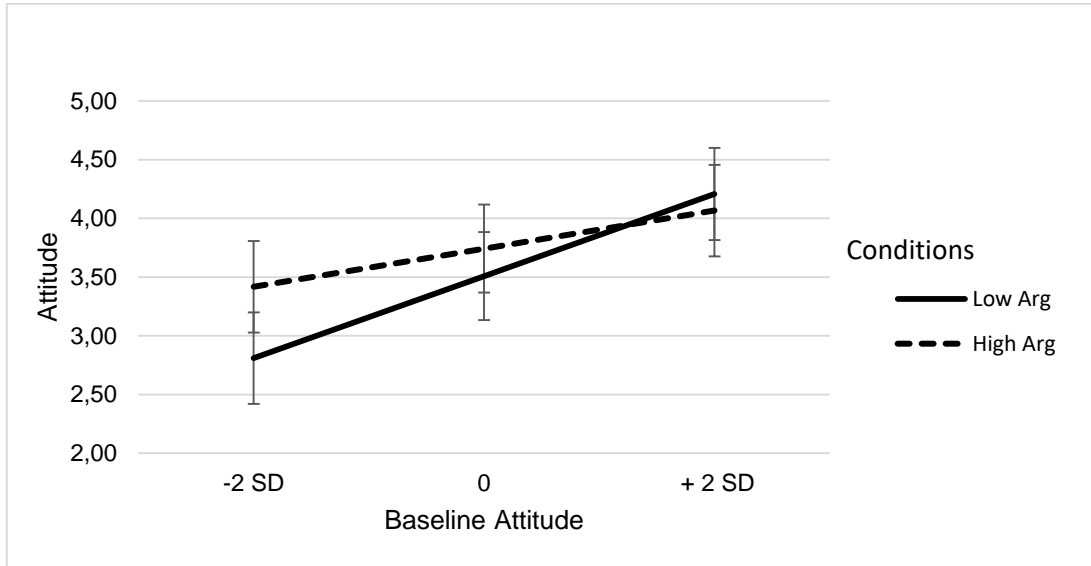


Figure 1. Two-way interaction effect between argument strength and baseline attitude on post-exposure attitude.

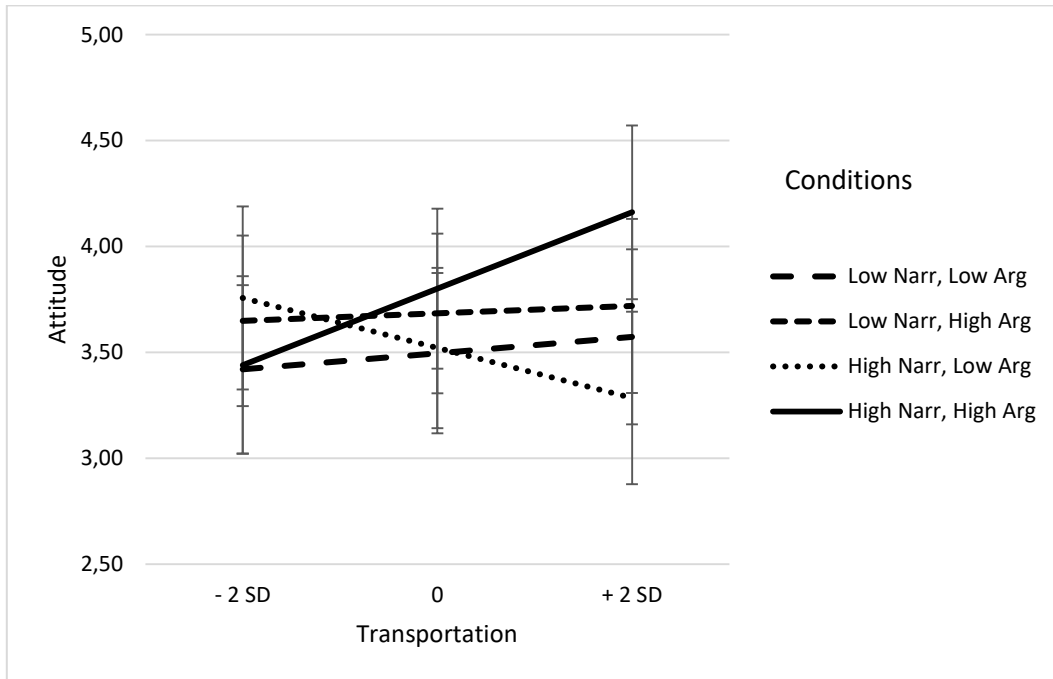


Figure 2. Three-way interaction effect between argument strength, narrativity, and transportation on post-exposure attitude.

Appendix

Overview of the arguments (story claims and reasons) used in the study.

Story claim	Argument strength	
	<u>low</u>	<u>high</u>
Cloning of plants is beneficial	<p>Cloning is part of an unstoppable development.</p> <p>Agricultural companies can make good money from the cloning of plants.</p> <p>Cloning is supported by some Nobel Prize Winners.</p>	<p>Unlike in genetically modified food, no genetic material is changed in cloning. This means that no new life form is created.</p> <p>A major advantage of cloning is that the characteristics of the plant type which are fixed in the genome can be kept intact.</p> <p>A "plant clone" is nothing but an offshoot, which sometimes also occurs naturally without human intervention.</p>
Eating salad is less healthy than people think	<p>The look of salad reminds many people of animal food.</p> <p>A society's orientation towards a diet rich in salad and other vegetables endangers the meat producing and processing industry.</p> <p>The preparation of salad is far too time-consuming.</p>	<p>The salad available in shops often contains many germs.</p> <p>Salad is often contaminated with heavy metals, such as lead, cadmium, and quicksilver, and with residues of pesticides.</p> <p>Lettuce leaves, especially when cultivated in a greenhouse, are enriched with nitrate, which is transformed into noxious nitrite by the human body.</p>
Tuition fees yield positive consequences for students	<p>Tuition fees lead to a useful competition between universities.</p> <p>If some students cannot afford the fees, there will be more resources for the students who can.</p>	<p>It is only fair that students who benefit longer from the university's services also have to pay more.</p> <p>With the students' financial contributions, considerably more money can be invested in teaching, which enhances the educational quality enormously.</p>

	If students have to pay tuition fees, then less money is available for irrational spending.	With tuition fees, more teaching staff can be employed. As a consequence, professors have more time for each student, which, for example, has a positive impact on the supervision of theses.
Smoothies are unhealthy	The product design is unnecessarily modern.	Smoothies often contain up to 40 grams of sugar, which is 30% more sugar compared to a coke.
	Smoothies are not essential, because hardly anyone has a vitamin deficiency.	Doctors state that smoothies contain less vitamins than promised by the manufacturer.
	The list of ingredients is often needlessly printed in several languages.	The high amount of sugar and acidity in smoothies can cause serious tooth decay.