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The Mediating Role of Event-Congruent Emotions in Narrative Persuasion

Markus Appel[1][*], Constanze Schreiner[1][*], Maj-Britt Isberner[2], & Tobias Richter[1]

[1]University of Würzburg, Germany

[2]University of Kassel, Germany

[*] Shared first authorship

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Correspondence concerning this article should be addressed to Markus Appel, Human-Computer-Media Institute, University of Würzburg, Oswald-Külpe-Weg 82, 97074 Würzburg, Germany. E-mail: markus.appel@uni-wuerzburg.de

Abstract

Listening to, reading, or watching a story is often a highly emotional experience. The current experiment was designed to gain insight into the role of emotions as part of the persuasive influence of stories. Our focus was on emotions that correspond to a storyline (event-congruent emotions). A short movie was presented that depicts the struggles of a limbless man who ultimately performs a successful circus act. Recipients' mindsets regarding human potential to improve (growth mindset and fixed mindset) served as the dependent variables. Six emotional scenes over the course of the movie were pre-selected to examine the occurrence and effect of event-congruent emotions. Transportation into the story-world was manipulated via reviews of the movie. Participants' emotional experience was assessed with a software that measures and classifies emotional facial expressions in the moment they occur. After reading a positive review, participants reported to be more transported into the short film. This was related to more intense event-congruent emotions during the key-scene of the film, which, in turn, was positively related to recipients' growth mindset. Implications regarding the importance of event-congruent-emotions for narrative persuasion are discussed.

Keywords: event-congruent emotions; facial expressions; narrative persuasion; transportation; mindset

The Mediating Role of Event-Congruent Emotions in Narrative Persuasion

When people are asked about situations that have made them cry, they mention "a sad moment in a movie" as the second most frequent reason after "the death of someone close" according to a study conducted for Kleenex (Fox, 2004). Forty-four percent of men and 80 percent of women indicate that a sad movie, TV-show, or book has moved them to tears. Emotions are a crucial part of processing narratives; stories are not only triggering sadness, stories can make people burst with laughter, or make them nervously slide back and forth in their seat, dying for an alleviating turn of events. People often follow stories because of a desire to be entertained, to experience suspended reality (i.e., escapism), or to enrich their everyday lives. However, stories not only entertain but also influence recipients' attitudes, beliefs, and behavior (e.g., Appel & Richter, 2007; Dill-Shackleford, Vinney, & Hopper-Losenicky, 2016; Green & Brock, 2000; Hamby, Brinberg, & Daniloski, 2017; Hinyard & Kreuter, 2007; van Laer, Feiereisen, & Visconti, 2019). Theoretical accounts of narrative persuasion as well as a number of empirical studies emphasize the importance of emotions for narrative persuasion (e.g., Betsch, Ulshöfer, Renkewitz, & Betsch, 2011; Frisby, 2006; Keer, van den Putte, de Wit, & Neijens, 2013; Nabi, 2002). We argue that the way people respond emotionally as the story unfolds is crucial for narrative effects. More specifically, we assume that the match between the emotional arc of the narrative and recipients' affective responses towards the characters and events depicted in the story is crucial for narrative persuasion. If an emotional response matches the emotional storyline we call this emotion an *event-congruent emotion.*

To gain insight into the role of event-congruent emotions for narrative persuasion, we conducted an experiment. Participants' growth mindset was our target belief and a short movie served as our narrative stimulus. Transportation was manipulated with the help of movie reviews. The current study was guided by the assumption that the extent of transportation into the story-world would be associated with the experience of event-

congruent emotions. Event-congruent emotions, in turn, were expected to predict story-consistent beliefs. To assess emotional responses continuously over the course of a narrative, we recorded participants' facial expressions and used a software which is able to classify facial expressions in the moment they occur.

The Role of Emotions in Narrative Persuasion

From early on, theorists have agreed on the importance of emotions in narrative persuasion. Gerrig (1993), who introduced the concept of transportation to the research field, ascribes stories the power "to carry the reader away with emotion" (p. 17). According to Gerrig (1993), transported readers lose access to real-world facts and experience strong emotions and motivations, even when they know the events in the story are fictional. Green and Brock (2000), who later took up Gerrig's idea of transportation as a journey into the story world, emphasized that emotional reactions are an important aspect of the transportation experience. A very similar concept for explaining narrative effects was offered by Busselle and Bilandzic (2008, 2009). Their concept of narrative engagement has a large overlap with transportation, and consists of four components: narrative understanding, attentional focus, narrative presence, and emotional engagement, with the latter showing particularly strong relationships to story-consistent attitudes (Busselle & Bilandzic, 2009). Other models focus more on sharing emotions with the characters of the story than on affective responses in general. Slater and Rouner (2002) argue in their *extended elaboration likelihood model* (E-ELM) that story recipients develop empathic responses to story characters and become emotionally involved as a consequence of transportation (or absorption, a term they used synonymously). Similarly, Moyer-Gusé (2008) emphasizes in her *entertainment overcoming resistance model* (EORM) – an extension of the E-ELM (Slater & Rouner, 2002) – the roles of emotions, parasocial interaction, and identification with story characters for narrative impact: the recipient imagines himself or herself as a particular character, loses self-

awareness, and takes on the feelings, perspectives, and goals of that character. This emotional experience makes the viewer or reader susceptible to persuasion.

The theories mentioned above focus on emotions in general. Yet, other theoretical approaches emphasize the role of distinct emotions (Nabi, 2002). Nabi (1999) describes how message-related negative emotions like fear, anger, sadness, guilt, and disgust affect the direction and stability of persuasive outcomes in her *cognitive functional model* (CFM). Over the past years, research has become increasingly interested in emotional flow*,* a series of emotional shifts throughout a narrative (Nabi & Green, 2015). Emotional shifts are regarded as a driving motivating force for continued attention. This continued attention, in turn, may be crucial to sustain transportation.

The importance of emotions for narrative persuasion is supported by a number of empirical results. Studies on the role of emotions for narrative impact fall into three categories. First, there are studies that compare the influence of stories with emotional content to stories without emotional content. Studies focusing on the influence of emotional versus non-emotional narratives showed that narratives with a high level of expressed emotions (emotional adjectives, emoticons, and descriptions of emotional experiences) had a higher impact on behavioral intentions than narratives with low expressed emotions (Betsch et al., 2011). Moreover, reading a story that described the emotional benefits of a preventive medical check-up led to a higher willingness to in fact do the check-up compared to reading a narrative that described more general benefits (Frisby, 2006). Similarly, describing positive emotional consequences was more persuasive than describing positive physical consequences (Keer et al., 2013). In line with the assumption that emotions in general facilitate the persuasive impact of narratives, individuals high on the *need for affect* (i.e., the disposition to approach or avoid emotions) are more likely to be transported into the world of narratives (Appel, Gnambs, & Maio, 2012), particularly if the story deals with significant life events or other affective plot developments (Appel & Richter, 2010).

Second, a number of studies focused on one specific emotion, often concentrating on fear appeals, i.e., persuasive messages that highlight the perils of certain behaviors and of not following the advice given in the message. Meta-analytic evidence suggests that fear appeals are effective in most circumstances and rarely backfire (Tannenbaum et al., 2015). Apart from fear appeals, studies on humor have received a substantial amount of attention, with meta-analyses suggesting a generally beneficial effect of humor on persuasion, but also substantial variation for different persuasive outcome variables (e.g., Eisend, 2011).

Third, research has been conducted on emotional shifts and their effect on persuasive outcomes. Nabi and Green (2015) assume the emotional 'rollercoaster ride' recipients experience over the course of a narrative to be an important factor contributing to the persuasive power of narratives. They call emotional shifts a 'signature' of narrative messages (Nabi & Green, 2015, p. 8). Shifts in how people feel as they engage with a story might evoke subsequent shifts in their opinions and attitudes, making those changes more powerful and long lasting. According to Nabi and Green (2015), emotional shifts can include those from negative to positive (e.g., fear to relief), from positive to negative (e.g., happiness to sadness), and from one negative or positive emotional state to another state of a similar valence (e.g., fear to anger, or happiness to pride). Marked variations in the intensity of a specific emotional experience may also be considered a form of shift (Nabi & Green, 2015, p.7). However, until now, only a limited number of empirical studies have focused on the idea that different distinct emotions and shifts between those emotions are especially important. There is some empirical support from the field of advertisement research: studies have shown that commercials are most effective when emotional reactions shift from negative to positive during the viewing process (e.g., Rossiter & Percy, 1991; Rossiter & Thornton, 2004).

Taken together, theoretical approaches and empirical results support the notion that emotions in general and distinct emotions in particular are a crucial factor for narrative

persuasion. In the present study, we will provide a nuanced experimental investigation of distinct emotions in narratives and their influence on persuasive outcomes.

Event-congruent Emotions

There have been different attempts at classifying emotional responses to media stimuli. One major approach is to distinguish emotions elicited by the story plot from emotions elicited by the text (i.e., the novel or the movie) as a product or work of art (e.g., Oatley, 1995; Miall & Kuiken, 2002; Tan, 1994; Vorderer, 1992; cf. Mar, Oatley, Djikic, & Mullin, 2011; Wirth & Schramm, 2005). Whereas much of the early theoretical work focused on written literary pieces, Tan and Frijda (1999; see also Tan, 1994) addressed film-elicited emotions, suggesting a differentiation between *F-* and *A-emotions*. Recipients' emotions are often a consequence of witnessing the events unfolding, recipients are concerned about the fate of the protagonists and respond according to what occurs in the fictional world (Tan, 1994). Such witness emotions are called 'fiction-based' emotions (F-emotions, Tan, 1994; Tan & Frijda, 1999). Moreover, emotional responses can be elicited by the film as a human-made cultural product or artefact (A-emotions, Tan, 1994). For example, recipients may feel admiration and enjoyment of a film in terms of its artistic merit. In the current work, we aim to expand on Tan and Frijda's idea, further distinguishing F-emotions into those that are implied by the events unfolding and emotions that are not implied by the narrative events. Our focus here is on the former, the changing emotions that are congruent with the dramatic events and the plotline of a narrative (*event-congruent emotions, ECEs*).

Our taxonomy of emotional responses that can occur while following a story starts with the distinction between emotions that are elicited by the movie, book, or podcast and emotions that occur while reading or watching, but the object of the emotional response is neither a story nor the media product (Wirth, Schramm, & Böcking, 2006). For example, viewers may feel fear while watching a series on Netflix, but not in response to the events

unfolding but because their adolescent child is not home yet. They may feel happiness because a certain person sits next to them in the movie theater, etc. (Figure 1).

If an emotion is elicited by the story, it can be either event-congruent or non event-congruent. An event-congruent emotion is an emotion that is implied by the dramatic events at a particular moment, for example, happiness due to a success of the protagonist. A non event-congruent emotion is an emotion that is elicited by the story, but that is not implied by the unfolding events. For instance, a narrative character reminds the recipient of a beloved deceased person, and thus, causes sorrow, whereas the plotline takes a funny turn. Sometimes, readers or viewers do not comprehend the motivations of the characters or the story setting, leading to non event-congruent emotions. Or, they comprehend more than they should: For some readers, a murder mystery may be no mystery after a short reading because they (feel they) know who committed the crime, eliciting boredom instead of fear, curiosity, and finally happiness when the case is solved. The reader may further feel a little angry about the low craftsmanship of the murder mystery (not being a mystery). As illustrated in this example, the experience of event-incongruent F-emotions (e.g., boredom) can lead to affective responses on the level of A-emotions (e.g., anger) in terms of Tan's approach (Tan, 1994).

It is important to note that event-congruent emotions are conceptually distinct from the emotions a focal story character experiences. Rather, we use the term *event-congruent* to indicate that the recipient feels the emotions that are implied by the events unfolding. Although event-congruent emotions often overlap with the affective experiences of main characters, they diverge at times (e.g., Tan, 1994). For example, in a climactic scene in which the antagonist fails, an event-congruent emotion would be happiness or relief. In a scene in which an adversary is hiding unbeknownst to the protagonist, the latter may feel happiness (e.g., she remembers a pack of beers she had stored in the cellar) while the recipient's event-congruent emotion is fear.

The aim of the present study was to gain insight into the influence of event-congruent emotions on narrative persuasion. Due to the emotional arc of the narrative, event-congruent emotions continuously change over the course of the narrative. Therefore, the best approach to measure event-congruent emotions is to assess them at the moment they occur. Compared to retrospective self-report measures, the online assessment of emotions yields the benefit of being less vulnerable to cognitive biases, and research provides evidence for the existence of emotions that influence behavior without being consciously experienced by the individual (Winkielman, Berridge, & Wilbarger, 2005). Given these drawbacks of self-reports of experienced emotions, an objective online measure of emotional responses is a promising way to assess event-congruent emotions at the moment they occur.

The potential of stories to change mindsets

In the present research mindsets serve as the main dependent measure. According to Dweck's approach individuals differ in their beliefs about whether intelligence, talent, and other attributes are stable (fixed mindset) or whether they can be changed with effort (growth mindset, e.g., Dweck & Leggett, 1988; Molden & Dweck, 2006). These mindsets are akin to implicit theories, with an entity theory portraying a personal attribute as relatively stable (fixed mindset) and an incremental theory that portrays the attribute as relatively malleable (growth mindset). In several studies individuals with a strong growth mindset turned out to be more successful at school (e.g., Blackwell Trzesniewski, & Dweck, 2007) and at the workplace (e.g., Heslin & Vanderwalle, 2008). Those with a growth mindset were eager to face challenges, displayed a mastery-oriented response, and maintained self-esteem, primarily because they attributed failure to a lack of effort rather than a lack of intellectual ability (e.g., Hong, Chiu, Dweck, Lin, & Wan, 1999).

Mindsets themselves can be changed: In a study by Aronson and colleagues (Aronson, Fried, & Good, 2002) participants in an intervention group were exposed to an instructional video emphasizing the scientific validity of a growth mindset and they were asked to write a

letter to a pen pal emphasizing that it makes sense to work hard despite drawbacks, because intelligence can grow – "like a muscle" – with mental work. After the intervention participants in this group (vs. two control groups) had a more flexible mindset of intelligence. Moreover, they enjoyed academia more, were more engaged in academia, and received higher grade point averages. The mindset approach does not apply to intelligence alone, it has been extended to the malleability of other characteristics of oneself and others. In one study, researchers tried to influence fixed vs. growth mindsets on aggressiveness, within the context of the Israeli-Palestinian conflict (Halperin, Russell, Trzesniewski, Gross, & Dweck, 2011). They succeeded at influencing participants' mindset by presenting articles that described research and case studies on the topic of aggressive tendencies in groups. One set of information depicted groups as being capable of change, whereas the other set of information portrayed groups as being unlikely to change. Notably, in Chapter 8 of her popular book on mindset, Dweck (2006) provides several anecdotal examples of short-term changes of a fixed to a growth mindset, mostly caused by narratively structured interventions. She argues that mindsets can be changed by short-term interventions, although it can at times be hard to maintain a growth mindset in the face of failures and setbacks.

In sum, mindsets regarding the malleability of aptitudes were found to have important consequences, and mindsets can be changed by presenting information in support of or against the possibility of growth. No research to date, however, has systematically addressed the influence of fictional stories on mindsets. We believe that stories have the power to change mindsets similar to the various other types of beliefs that have been tackled in prior research on narrative persuasion. Overcoming personal limitations that might be conceived as fixed by others is a steady topic of works of fiction since the era of enlightenment. Thus, fiction could be a major source of growth mindsets among individuals.

Study Overview and Predictions

Theory and empirical findings suggest that emotions in general, and shifts between different distinct emotions over the course of a narrative in particular, are crucial for narrative persuasion, as they have an influence on message selection, message processing, and post-message engagement (Nabi & Green, 2015). Most previous studies measured the emotional experience of recipients with retrospective questionnaires, which are time- and cost-efficient to use, but suffer from a couple of drawbacks. It is not clear how accurate the participants' retrospective ratings of their emotions at specific points in the narrative can be, and whether the ratings reflect an average of all emotional experiences during the narrative, whether it only captures the peaks, or whether primacy and recency effects play a role. Hence, in the current study, we used an online measure of recipients' emotional experiences and continuously assessed the facial expressions of the participants. By employing this method, it was possible to determine if participants showed event-congruent emotions in terms of displaying a particular emotion during particular parts of the movie. We assumed that event-congruent emotions are an important mediating factor for the persuasive influence of the narrative.

Prior research has shown that transportation and the emotional involvement with a story are closely intertwined. Therefore, we expected that a manipulation of transportation would in turn influence the intensity of participants' emotional engagement. We experimentally manipulated the extent of transportation into the story world by using a review technique. Recent research suggests that reviews about a work of fiction influence recipients' transportation into story worlds, with positive reviews leading to more transportation than negative reviews (e.g., Gebbers, Appel, & De Wit, 2017; Isberner, Richter, Schreiner, Eisenbach, Sommer, & Appel, 2018; Shedlosky-Shoemaker, Costabile, DeLuca & Arkin, 2011; Tukachinsky, 2014). The supposed mechanism is that participants develop expectations, which, in turn, shape how deeply recipients are drawn into the narrative world (Tan, 2008; Tiede & Appel, 2019). A positive review of the movie should lead to higher

reported transportation scores regarding the same movie compared to a negative review. We further expected that high levels of transportation should be associated with intense event-congruent emotional experience while watching the movie. More intense event-congruent emotional experiences should in turn lead to a more story-consistent mindset. Together, these assumptions imply a two-step mediation model, which we tested in the present study.

Method

Participants

Ninety-four undergraduates (65 women, $M = 23.69$ years; $SD = 4.21$ years) of a midsized German university took part in the study. All participants indicated German as their first language and participated in the study voluntarily, obtaining credit points or 5 € for doing so. The initial sample consisted of 100 participants. Three participants had to be excluded because technical problems with the recording software caused incomplete video records. Another participant had to be excluded from the analysis because he did not watch the movie completely. One participant had to be excluded because she was under age, and another participant had to be excluded because she wore extensive eye make-up, which disturbed the software-based analysis. Thus, all analyses were conducted with a final sample of 94 participants.

Stimulus Film

The participants watched the short independent movie *Butterfly Circus* produced by Joshua Weigel in 2009, which had a total length of 22:35 min. The story takes place during the time of the Great Depression in America and depicts the illustrious Butterfly Circus touring through the country trying to convey distraction and joy to the people. One day they meet Will, a limbless man who spends his miserable life as a member of a carnival side show.

Will escapes the carnival sideshow and joins the Butterfly Circus. In the course of the film, Will experiences that no goal is impossible to reach if one works hard and believes in oneself. He overcomes the shame he feels about himself, gains self-esteem, and discovers

undreamt abilities, with the result that he gets his own circus act and becomes the star of Butterfly Circus. In summary, Butterfly Circus is a film about finding a new life, reaching unexpected heights, and breaking through self-imposed limitations.

Selection of specific scenes. As we were particularly interested in event-congruent emotions, we asked three coders to watch the movie and to define scenes in which a particular primary or basic emotion was clearly implied by the plot. Emotional cues can be given through emotionally relevant events happening to characters, such as being fired from a job or surviving a natural disaster, as well as through a character's display of nonverbal and verbal cues, like gestures, facial expressions, or voice (Lang et al., 2007; Weiss & Wilson, 1996). Moreover, editing techniques such as flashbacks, close-ups, or other visual and sound effects are known to increase the likelihood of inducing emotional experiences (Weiss & Wilson, 1996).

The coders could choose between six basic emotions (Ekman & Cordano, 2011; Ekman, Sorenson, & Friesen, 1969): happy, sad, angry, scared, surprised, and disgusted. These six basic emotions can be quantified by the facial expression analysis software (*FaceReader*, see more below). Six scenes were chosen where all three coders agreed upon the primary emotion elicited by the events unfolding. The final selection contained two scenes that were supposed to induce happiness (happy1 and happy2), sadness (sad1 and sad2), and anger (angry1 and angry2). An overview of the content and position of selected scenes can be found in Figure 2. Scene happy2 was the climax of the movie, as it depicted the final success of Will, the protagonist.

Review treatment. We manipulated transportation by presenting movie reviews, which were either positive or negative. Providing positive versus negative reviews is an effective way to manipulate involvement with the media stimulus (e.g., Isberner et al., 2018; Shedlosky-Shoemaker et al., 2011; Tiede & Appel, 2019; Tukachinsky, 2014) and has the advantage that the story itself remains untouched and the participants are not requested to

engage in an extra task while following the movie (such as identifying difficult words for readers who are at a fourth grade level, Green & Brock, 2000). The reviews are provided in the online supplement (Supplement S1).

Measures

Dependent variables. Dependent variables were implicit theories (or mindsets) on talent. To assess these implicit theories on talent we used the eight items introduced by Dweck (2006), constituting the two components of fixed mindset and growth mindset. A *fixed mindset* is marked by the opinion that talent is a stable entity that will not change and cannot be controlled by the individual (e.g., "Your talent in an area is something about you that you can't change very much."). In contrast to this, a *growth mindset* is characterized by the belief that talent can be developed and that it is based on hard work, learning, and training (e.g., "No matter who you are, you can significantly change your level of talent."). The eight items (four items assessing fixed mindset, four items assessing growth mindset) come with a 6-point scale ranging from 1 = "do not agree at all" to 6 = "agree very much". We translated the eight items into German using the committee scale translation method (Van de Vijver & Leung, 1997). Cronbach's α was .87 for the fixed mindset and .80 for the growth mindset. As Dweck (2006) argues people "enter" either one mindset or another, therefore prior research sometimes only reports on one mindset (e.g. Yeager et al., 2016). To get a better idea of the full picture we decided to assess both, growth and fixed mindset.

Assessment of emotions. Participants' emotions while watching the movie were assessed by using a commercially available automated facial coding (AFC) software developed by VicarVision and Noldus Information Technology (*FaceReader*, Noldus, 2013). FaceReader recognizes and categorizes facial expressions. The classification is based on Ekman and Friesen's theory underlying the Facial Action Coding System (FACS; Ekman & Friesen, 1978) which states that basic emotions correspond to specific facial expressions. As an advancement of manual facial coding, which is a well-established but labor-intensive

method, FaceReader automatically classifies movements of muscular parts of the face (action units) into discrete categories of basic emotions (Ekman & Cordano, 2011; Ekman et al., 1969). FaceReader works in three steps. First, it detects a face in the video-image. Second, the software generates a 3D Active Appearance Model of the individual face by describing 500 key points. Third, it continuously observes the relation of the key points to each other and computes intensity scores for the six basic emotions (and a neutral state). Each expression has a value between 0 and 1, indicating its intensity. "0" means that the expression is absent, "1" means that it is fully present.

To address individual physiognomic differences (some people's neutral facial expressions would be interpreted as angry or sad) FaceReader offers the possibility to correct for these person-specific biases. This option is called *participant calibration*. It requires video fragments of each participant in which he or she displays a neutral facial expression, as well as expressions of the six basic emotions recognized by FaceReader. All our participants took part in a second study after the present experiment, where they were shown six video clips that were supposed to induce the six basic emotions. Therefore, we had seven video-recordings of each participant (the video recorded for the present study, plus six more videos inducing basic emotions). Using these recordings, FaceReader was able to calibrate system to account for interindividual differences.

Previous research corroborates the validity of this methodological approach. In a validation study (Lewinski, Fransen, & Tan, 2014) FaceReader correctly recognized 88% of the emotions depicted in the Warsaw Set of Emotional Facial Expression (Olszanowski et al., 2014) and the Amsterdam Dynamic Facial Expression Set (van der Schalk et al., 2011). The results were on par with human raters who recognized 85% of the stimuli correctly (see also den Uyl & van Kuilenburg, 2005). When our study was conducted, FaceReader was the only AFC software backed by scientific validation (Stöckli, Schulte-Mecklenbeck, Borer, & Samson, 2018). There is a growing body of research using FaceReader as a method to infer

people's emotional experiences. FaceReader has been successfully used in several independent labs to study user responses to entertainment, advertising, music, and the arts (e.g., Chentsova-Dutton & Tsai, 2010; Stanko-Kaczmarek & Kaczmarek, 2016; Teixera, Wedel, & Pieters, 2012; Weth, Raab, & Carbon, 2015) as well as in cognitive and clinical psychology (El Haj, Antoine, & Nandrino, 2016; Fujiwara, Mizuki, & Chemtob, 2015).

Transportation. Transportation was assessed with the German version of the Transportation Scale - Short Form (TS-SF, Appel, Gnambs, Richter, & Green, 2015). It consists of six items (with 7-point response scales, ranging from 1 = "not at all" to 7 = "very much") that refer to cognitive, affective, and imaginative aspects of transportation (e.g., "The narrative affected me emotionally", "I could picture myself in the scene of the events described in the narrative"). The reliability of the scale was good (Cronbach's α = .88).

Additional measures. Participants were further asked to complete the Need for Affect Scale - Short Form (Appel, et al., 2012; Maio & Esses, 2001), the Interpersonal Reactivity Index (IRI) as a measure of trait empathy and perspective taking (Davis, 1980; German version by Paulus, 2009), narrative engagement (Busselle & Bilandzic, 2009), identification with the story's protagonist (Cohen, 2001), and attitudes towards disabled persons (Yuker, Block, & Young, 1970). These scales were not further analyzed in the following but are reported here for transparency reasons.[1]

Procedure

Participants were tested individually and told that they were taking part in a study about movie reception. Upon arrival at the laboratory, participants read and signed an informed consent that they were going to be videotaped during their stay in the laboratory.

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[1] These measures were included for potential exploratory analyses and re-analyses but due to the time-consuming facial expression analyses and the already substantial complexity of this project, these analyses were never carried out. The trait measures need for affect and the Interpersonal Reactivity Index (IRI) were rather tangential to our research questions. Need for affect was significantly correlated to participants' transportation experience, $r = .25$, $p = .016$, while the IRI was not, $r = .17$, $p = .104$. Among the self-report variables of experiential states, transportation was strongly related to both narrative engagement, $r = .79$, $p < .001$, and identification, $r = .68$, $p < .001$. Given these large associations, the contribution of providing additional analyses on narrative engagement and identification appeared to be limited.

They were seated in front of a Laptop with a Logitech C920 USB HD Pro Webcam. The experimenter ensured that the participant's face was completely visible on the screen. As strong shadows or reflections can impair the quality of the FaceReader analyses, we used a diffuse frontal lamp as employed by professional photographers, in order to ensure optimal light conditions.

Participants were randomly assigned to one of two groups. One group received and read a positive movie review presented to be from a well-known German newspaper; the other group read a negative review. The reviews were used to manipulate participants' transportation into the story world (see Tiede & Appel, 2019). To ensure that the participants had actually read the review, they were asked to recall and summarize the review content immediately after reading the review. All participants recalled the content and valence of the movie review correctly. After participants had watched the movie, they were asked to fill in the TS-SF (Appel et al., 2015) and to answer the items on their mindset of talent that served as dependent variables. Finally, we assessed participants' sociodemographic information. The design was a single factor between-subjects design with random assignment of participants to either the positive or the negative movie review.

Results

Transportation

To examine the influence of the positive and the negative movie reviews on transportation, we conducted a one-way ANOVA. As expected, participants who had read the positive movie review reported being more transported ($M = 5.32$, $SD = 0.95$) than participants who had read the negative review, $M = 4.86$, $SD = 1.22$, $F(1,93) = 4.35$, $p = .040$, $\eta^2 = .045$ (all tests of significance were two-tailed). We expected that the relationship between the experimental manipulation (positive vs. negative movie review) and mindset would be directly mediated by transportation. However, there was no significant correlation between transportation and participants' growth mindset ($r = .18$, $p = .090$). Zero order correlations

between transportation, growth mindset, and the intensities of the expressed emotions can be found in Table 1.

Implicit Theories of Talent

We expected the movie to influence the participants' implicit theory of talent, operationalized as a) fixed mindset and b) growth mindset, whereby a stronger growth mindset and a weaker fixed mindset were expected in participants who had received the positive movie review. As expected, the growth mindset was stronger in the group that had read the positive review before watching the movie ($M = 4.04$, $SD = 0.93$), compared to the group that had read the negative review ($M = 3.56$, $SD = 1.09$), $F(1,93) = 5.28$, $p = .024$, $\eta_p^2 = .054$. Participants who had read the positive movie review reported a stronger belief that talent could be influenced by hard work, learning, and training. Surprisingly, there was no significant difference for the fixed mindset items (negative review: $M = 3.49$, $SD = 1.26$; positive review: $M = 3.24$, $SD = 1.06$), $F(1,93) = 1.12$, $p = .292$, $\eta_p^2 = .012$.

Facial Expression Analyses

Data preparation. To each frame of the video recording the FaceReader software assigns an estimation of the intensity of facial expressions of six basic emotions from 0 to 1. For our analysis we calculated the average of each emotion for each of the six scenes that had a priori been selected by the coders.

Intensities of the emotions displayed. To test if participants showed more event-congruent emotions in the specific scenes than in other scenes, we conducted a 2 (condition: positive vs. negative review) x 6 (scene one to six) mixed-design analysis of variance for each of the three different emotions we focused on: happy, sad, and angry. For an overview of the mean facial expressions in the six scenes see Table 2.

The first mixed-design analysis revealed a significant main effect of scene for facially expressed happiness, $F(2.58, 237.17) = 13.04$, $p < .001$, $\eta_p^2 = .124$.[2] Participants expressed significantly more happiness in scenes happy1 and happy2 than in any other selected scene (ps $< .003$; see also Supplement S3). The intensity of happiness between the two happy scenes did not differ ($p = .332$). There was no significant interaction between scene and transportation manipulation, $F(2.58, 237.17) = 0.67$, $p = .549$, $\eta_p^2 = .007$. This finding indicates that the experimental treatment had no influence on the difference between expressed facial happiness in the six scenes.

A second mixed-design analysis of variance with intensity of sad facial expressions as dependent variable also yielded a significant main effect of scene, $F(3.85, 353.86) = 4.30$, $p =.002$, $\eta_p^2 = .045$ (see also Supplement S4). Post hoc analyses revealed that there was a significant difference in intensity between the two sad scenes, scene sad1 induced more sadness than scene sad2 ($M = .18$, $SD = .19$, $M = .13$, $SD = .16$, $p = .043$). In addition, the intensity of facial expressions of sadness in scene sad1 differed significantly from the level of sadness shown in scene happy2, $M = .10$, $SD = .16$, $p = .003$, but did not yield a significant difference to the other scenes. The facial expression of sadness in scene sad2 was significantly lower than in scene angry2 ($M = .20$, $SD = .21$, $p < .001$). There was no significant interaction effect between scene and transportation manipulation for the intensity of sadness expressions, $F(3.85, 353.86) = 0.26$, $p = .897$, $\eta_p^2 = .003$.

A third mixed-design analysis with intensity of angry facial expressions yielded neither a significant main effect of scene, $F(4.23, 389.50) = 0.98$, $p = .420$, $\eta_p^2 = .011$, nor a significant interaction between scene and experimental condition (positive vs. negative movie review), $F(4.23, 389.50) = 1.47$, $p = .208$, $\eta_p^2 = .016$.

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[2] A Greenhouse-Geisser correction was applied to the degrees of freedom for all mixed design analyses.

Event-congruent emotions as a mediator. Participants showed more happiness in the two happiness-inducing scenes but did not show consistently more sadness or anger in the sadness- and anger-inducing scenes. Therefore, the following analyses focus on the two happiness-inducing scenes (happy1 and happy2) and their mediating role.

To examine the influence of reading a positive compared to a negative review on transportation and of expressed emotions on growth mindset, a multi-mediator-analysis was conducted (Hayes, 2013; Model 6). The review treatment (reading a positive vs. a negative review) served as the independent variable, while participants' growth mindset after watching the movie served as the dependent variable (DV). Transportation and the mean intensity of facially expressed happiness in scenes happy1 and happy2 served as mediators. For the following analyses the experimental treatment was dummy-coded (negative review = 0; positive review = 1).

The analysis yielded a significant total effect of the review treatment on the DV growth mindset, $b = 0.48$, $SE = 0.21$, $t(91) = 2.30$, $p = .024$ (see Table S4 in the online supplement). Participants who read a positive review reported a more pronounced growth mindset than participants who read a negative review. Furthermore, the review treatment had a significant effect on transportation, $b = 0.47$, $SE = 0.22$, $t(91) = 2.09$, $p = .040$. As outlined above, reading a positive review led to higher transportation scores and a stronger growth mindset than reading a negative review. Transportation, in turn, was significantly positively associated with the intensity of facially expressed happiness in both scenes, $b = 0.04$, $SE = 0.02$, $t(91) = 2.33$, $p = .022$. The intensity of facially expressed happiness was not significantly associated with participants' growth mindset, $b = 0.88$, $SE = 0.61$, $t(91) = 1.44$, $p = .153$. A bias-corrected bootstrap confidence interval (CI) for the indirect effect of review treatment on growth mindset mediated by transportation and the intensity of facially expressed happiness in both happy scenes did not include 0, however, *estimate* = .016 (95% CI: .0000, .0691). Thus, we found some support for the outlined indirect mediation effect. The

direct effect was significant in the multi-mediator model, $b = 0.44$, $SE = 0.21$, $t(89) = 2.07$, $p = .042$.

Given that the experience of event-congruent emotions could depend on the actual scene and its function in the narrative, we repeated the analysis with both happy scenes separately, starting with happiness in scene happy1. Of course, we again found the effect of the experimental treatment on participants' growth mindset and on transportation in this model (Table S5). The more transportation the higher was the intensity of facially expressed happiness in scene happy1, $b = 0.09$, $SE = 0.04$, $t(91) = 2.36$, $p = .021$. However, the intensity of facially expressed happiness was not associated with participants' growth mindset, $b = 0.19$, $SE = 0.28$, $t(91) = 0.67$, $p = .504$. The bias-corrected bootstrap confidence interval for the indirect effect of review treatment on growth mindset mediated by transportation and the intensity of facially expressed happiness in scene happy1 included 0, *estimate* = .008 (95% CI: -.007, .052). Therefore, the outlined path composed no significant indirect mediation effect, whereas the direct effect was significant in the multi-mediator model, $b = 0.42$, $SE = 0.21$, $t(89) = 1.99$, $p = .0497$.

Next, a bootstrapped multi-mediator-analysis with transportation and the intensity of facially expressed happiness in scene happy2 as mediators was conducted. In line with the results reported above, we found a significant total effect of the movie review on the DV growth mindset and on transportation. In turn, transportation was significantly associated with the intensity of facial expression of happiness at this key moment in the movie, $b = 0.09$, $SE = 0.03$, $t(91) = 2.77$, $p = .007$. Those who displayed stronger facial expressions of happiness in that particular scene, in turn, reported to have a stronger growth mindset, $b = 0.68$, $SE = 0.29$, $t(91) = 2.33$, $p = .022$. Importantly, the paths outlined above composed an indirect mediation effect (Figure 3 and Table S6). The bias-corrected bootstrap confidence interval for the indirect effect of review treatment on growth mindset via transportation and intensity of facially expressed happiness in scene happy2, based on 5000 bootstrap samples, was

significant, *estimate* = .030 (95% CI: .004, .104). Moreover, a significant direct effect of the movie review on the DV growth mindset was found, b = 0.44, SE = 0.21, t (89) = 2.12, p = .037. This pattern of effects indicates a partial mediation of the effect of the review treatment on growth mindset through transportation and facially expressed happiness in the key scene of the movie.

Additional Analyses

Additional analyses, all of them exploratory in nature, were conducted to broaden the results and to rule out alternative predictions. We first analyzed whether the event-incongruent – but prevalent – facial expression of sadness served as a mediator as well. To this end, we repeated the bootstrapped multi-mediator-analysis, this time with sadness at scene happy 2 as a mediator (Table S7). Neither the experimental treatment, b = -0.04, SE = 0.03, t (91) = -1.07, p = .286, nor transportation, b = -0.01, SE = 0.02, t (91) = -0.37, p = .710, were related to sad expressions. The more sadness recipients expressed during the key happy scene of the film, the lower was their growth mindset, b = -1.41, SE = 0.65, t (91) = -2.19, p = .031. Thus, whereas the event-congruent emotion of happiness was positively associated with the story-consistent mindset, we found a negative association for the event-incongruent emotion of sadness. None of the mediation paths in this model approached significance.

To broaden our results, we further examined *poignancy* as an aspect of mixed affect (Slater, Oliver, & Appel, 2019). Based on previous research on poignancy (e.g., Ersner-Hershfield, Mikels, Sullivan, & Carstensen, 2008; Slater et al., 2019) we calculated the minimum of sad or happy facial expressions during the happy2 scene.[3] This indicator was then included in the two-step mediation model. The poignancy indicator was positively

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[3] The work by Ersner-Hershfield and colleagues (2008) shows that the co-occurrence of happiness and sadness is a preferable indicator of poignancy, as compared to other indices combining happiness and sadness. Following extant research (Ersner-Hershfield et al., 2008; Slater et a., 2019), poignancy was calculated as the minimum of happiness scores and sadness scores during the scene. For example, if the average happiness score for the scene was 0.07 and the sadness score was 0.09, the participant scored 0.07 on poignancy. If the happiness score was 0.15 and the sadness score was 0.04, the participant scored 0.04 on poignancy.

associated with transportation, b = 0.011, SE = 0.005, t (91) = 2.32, p = .022, but unrelated to the experimental treatment, b = -0.017, SE = 0.011, t (91) = -1.62, p = .109, and unrelated to the DV growth mindset, b = -0.446, SE = 2.124, t (91) = -0.21, p = .834, yielding a non-significant mediation (see Table S8).

In our final additional analysis, we examined whether *changes* in happiness could serve as an alternative mediator. To this end, average happiness scores for the time period of scene angry2 were subtracted from average happiness scores for the time period of scene happy2 (Table S9). In a bootstrapped multi-mediator-analysis the resulting change score replaced happiness during scene happy2 as a mediator. The experimental treatment was unrelated to changes in happiness, b = -0.06, SE = 0.05, t (91) = -1.32, p = .191. The association with transportation was positive, but failed to reach statistical significance, b = 0.04, SE = 0.02, t (91) = 1.86, p = .067, and the same was true for the association with growth mindset, b = 0.83, SE = 0.49, t (91) = 1.68, p = .096. The mediational paths were all non-significant.

Discussion

Emotions are a crucial part of narratives, or as Oatley (2002) described it: "emotion is to fiction as truth is to science". Recipients would barely finish a novel or movie that did not move them. However, emotions are not only crucial for the feeling of being entertained; a number of studies indicate that emotions are also essential for the persuasive power of narratives. Recent theoretical approaches emphasize the importance of experiencing different emotions over the course of a narrative for narrative persuasion (Nabi & Green, 2015). In this paper we introduced the concept of event-congruent emotions and our results highlight the implications of experiencing the emotions that are implied by the story plot at certain points in the narrative. We examined the consequences of experiencing the emotional arc of a narrative on its persuasive outcomes by conducting an experimental study in which transportation into the story world was manipulated. Six scenes over the course of the movie

were pre-selected to examine the occurrence and effect of event-congruent emotions. To assess participants' emotions, we used an AFC software, which allowed a continuous assessment of emotional responses. In both scenes that were expected to elicit happiness, participants displayed event-congruent emotions, meaning that they showed more intense happy facial expressions than in the other four scenes we focused on.

The results show that recipients of a short movie reported higher transportation scores after they had read a positive movie review compared to recipients who had read a negative review prior to watching the film. Most interestingly, we found a sequential mediation: participants who had read the positive review reported higher transportation scores and higher transportation was associated with more event-congruent emotions in scene happy2. The extent of the event-congruent emotions, in turn, predicted participants' growth mindset. In addition to an indirect effect, we observed significant total and direct effects in this two-step mediation model.

The concept of event-congruent emotions – introduced in the current manuscript – as well as our empirical approach and findings contribute to theory and can inspire future studies on the role of emotions for narrative processing and narrative persuasion in several respects. Stories are dynamic. Recent research demonstrated that sections that imply higher and lower suspense lead to systematic changes in the allocation of attention by the recipients (Bezdek & Gerrig, 2017). Likewise, we suggest that the events unfolding in a story imply certain emotional responses and our findings provide initial evidence that such event-congruent emotions indeed occur. Event-congruent emotions at the key scene of the story, in turn, predicted a story-consistent mindset. Furthermore, we used an innovative measure to assess participants' emotions: an automated facial coding software that allowed to continuously capture participants' emotional reactions. This method has important advantages over retrospective self-reports that often do not sufficiently capture dynamic emotional responses (Levenson, 1988; Rottenberg et al., 2007).

Limitations and Future Research

Despite the contributions of the current work, limitations need to be noted. First, our final sample size of 94 participants, split across two experimental conditions, did not allow to identify small associations between the variables. A sensitivity analysis showed that we were able to detect a bivariate association of $r = .28$ (g*power, alpha-error probability = .05, beta-error probability = .20, $N = 94$, cf. Faul, Erdfelder, Buchner, & Lang, 2009). In recent years, scholars have demonstrated that the power in testing indirect effects is larger than the power in testing total or direct effects (Kenny & Judd, 2014). Still, the moderate power achieved needs to be acknowledged. Next, the assessment of emotional experiences via an automated coding software that quantifies facial expressions has its limitations. This methodological approach rests on two assumptions: The possibility of getting meaningful information on emotional experiences from facial expressions and the reliability and validity of the automated facial coding software. We recognize that not all emotion researchers agree on the notion of universal basic emotions and Ekman's theory and findings, which were the basis of our approach to categorizing and measuring emotional responses (e.g., Fugate & Barrett, 2014). Researchers have criticized the general idea that a state of mind causes muscular discharge, such as coordinated sets of facial muscle contractions (e.g. Barrett, 2012; Russell, 2003). Another line of research has pointed out that (intense) facial expressions can only be clearly interpreted if additional information about gesture and posture are available (Aviezer, Trope, & Todorov, 2012). Moreover, some studies have shown that facial behaviors like smiles are more likely to occur with other people around than without (e.g., Ruiz-Belda, Ferández-Dols, Carrera, & Barchard, 2003). This may explain why our participants (who watched the movie alone in the lab) did not show facially expressed event-congruent emotions in four of the six scenes.

On a related note, our work is based on the framework of six basic emotions (Ekman & Cordano, 2011) as a meaningful theoretical foundation for analyzing recipient responses.

This theory and the AFC software that was developed based on Ekman's work do not readily incorporate the experience of mixed affect, most notably the experiences of being moved, of appreciation, or of poignancy (e.g., Cova & Deonna, 2014; Menninghaus et al., 2015; Slater, Oliver, & Appel, 2019; Oliver & Bartsch, 2010; Oliver et al., 2018). As the latter theory and research demonstrates, many movies and written stories elicit some form of mixed affect – and in all likelihood, our stimulus film is no exception. Thus, one may question whether pure "happiness" is the best label for the emotion experienced when the limbless man succeeds in his circus act. Yet, the theory and the methods regarding how to capture responses such as 'being moved' are still developing (cf. Zickfeld, Schubert, Seibt, & Fiske, 2019). Post-exposure self-reports have been the dominant assessment method. Future research is encouraged to connect research on mixed affect with our theoretical and empirical focus on event-congruent emotions and the assessment of emotional responses in the moment they occur.

Regarding our underlying assumptions, we need to add that, of course, facial expressions are not the only manifestations of emotions. In the current study, we neither measured arousal, nor did we ask participants about their feelings at specific scenes. Such additional data could have strengthened our conclusions. Facial response analyses, despite their increasing use in several labs examining the processing of media and the arts, might not be sensitive enough to capture emotions of small to medium intensity. We selected six scenes over the course of the narrative, but we were able to identify event-congruent emotions in only two of the six scenes. In both happy scenes, participants showed more intense happy facial expressions compared to the two sad and two angry scenes. Regarding the sad and the angry scenes, we did not find that participants expressed more intense sad or angry facial expressions compared to the other scenes. Possibly, the emotions were not strong enough to be expressed facially, or – addressing our second assumption – our method to quantify facial activation was not sensitive enough. Difficulties with eliciting measurable emotional facial

expressions have been reported before. Hazlett and Hazlett (1999), for example, refer to prior findings in which too few content-related facial expressions in response to TV ads were observed to warrant scoring and other findings in which FACS scores were unrelated to attitudes towards an ad whereas self-reports of emotions showed the expected association.

We found that the indirect effect of the review treatment via transportation and event-congruent emotions on participants' growth mindset was limited to the last scene of the movie. One possible explanation is that this scene was *the* happy scene of the movie and represented the climax as well as the key message of the story: Will, the protagonist, successfully performs his own circus act and becomes the star of Butterfly Circus, after he had been struggling with his disability his whole life. Therefore, this is probably the most intense scene, and hence, it might elicit the most intense emotional reactions. It is also the scene that is central to the persuasive power of the movie. Moreover, the effect might be influenced by the position of the scene within the movie: scene happy2 depicted the moment after the turning point of events, initiating the happy ending. Additionally, research has shown that not all emotions are equally easy to elicit using films. Happiness and disgust are easier to induce than sadness or anger (den Uyl & van Kuilenburg, 2005). Hence, our findings are in line with a study that reports success rates of 80% for happiness-inducing films compared to 32% for sadness-inducing films (Gross & Levenson, 1995). Besides, differences in the intensity of emotional responses towards films have been found, with disgust being the most intense, followed by happiness, anger, and sadness, tailed by surprise and fear (Gross & Levenson, 1995).

Extending our limitations beyond the field of emotional responses and related assessment, we need to note that we did not find an association between our variables and recipients' fixed mindset. The latter variable was unrelated to transportation scores and to the emotional responses of the participants. Whereas contrasting results for growth vs. fixed

mindsets have been reported before (Bahnik & Vranka, 2017), more research is needed on diverging effects when mindsets are addressed by stories.

A further limitation regards the sequence of transportation and event-congruent emotions (or emotional experiences more generally). We manipulated transportation and conceived event-congruent emotions to be a function of how deeply transported recipients were. The concept of transportation and the related notion of emotional engagement include the understanding of a narrative, constructing mental models, and building mental imagery (Busselle & Bilandzic, 2009; Gerrig, 1993). Busselle and Bilandzic, for example, refer to deictic shifts (Segal, 1995) as a requirement for emotional engagement. This line of argument would support a causal chain in which transportation precedes event-congruent emotions. That said, other theory and research has emphasized alternative perspectives in which emotions precede transportation (Bezdek & Gerrig, 2017; Nabi & Green, 2015). The present results do not support this alternative causal order as the experimental treatment had a direct effect on transportation, but no direct effect on our key event-congruent emotions. Still, alternative causal orders should be examined in future studies because it is unclear to what extent the current results are affected by the particular movie, sample, and assessment methods employed in this study.

In the current study, we relied upon means for each of the selected scenes to measure the participants' emotional responses. The average response to a scene is a useful summary statistic that is appealingly simple. At the same time, movies have a relatively low temporal resolution, meaning that it takes rather long to induce a certain emotion in the viewers. Moreover, films typically create heterogeneous data, as there are large interindividual differences regarding the emotion onset and the intensity of the emotions displayed (Rottenberg, Ray, & Gross, 2007). This suggests that the time-window average strategy will almost inevitably include sequences low in emotional responses which mitigates the results for the emotion one would like to focus on.

Future research could further explore long-term effects of event-congruent emotions on attitudes and beliefs, as there is empirical evidence that narrative effects are long lasting and can become even stronger over time (Appel & Richter, 2007). With regard to growth mindsets, investigations of long-term effects would be particularly important because it might be relatively easy to increase a growth mindset even by a short-term intervention but difficult to maintain the growth mindset in the face of challenges and setbacks (Dweck, 2006).

Conclusion

The present research has important implications for research in the field of emotion and narrative persuasion. In particular, it adds to our understanding of the role of distinct emotions in narrative persuasion. We introduced the concept of event-congruent emotions and extended the knowledge on the impact of experiencing different distinct emotions within a narrative, which has received little attention in empirical research so far. In the current study, we used an innovative measure to continuously assess emotions while watching a movie. Our findings indicate that transportation may enhance the experience of event-congruent emotions, and event-congruent emotions predict narrative impact.

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Table 1

Zero Order Correlations Between the Dependent Variables and Potential Mediators. P-values are Depicted in the Line Below the Correlation Coefficients

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) Growth mindset								
(2) Fixed mindset	-.752 <.001							
(3) Transportation	.176 .090	-.034 .745						
(4) Happiness during scene Happy1	.096 .355	-.121 .244	.152 .144					
(5) Happiness during scene Happy2	.203 .0496	-.192 .063	.251 .015	.485 <.001				
(6) Sadness during scene Sad1	-.045 .667	.016 .881	.080 .445	.138 .186	.037 .721			
(7) Sadness during scene Sad2	-.084 .422	-.072 .489	-.137 .187	-.02 .849	-.063 .547	.208 .045		
(8) Anger during scene Angry1	-.003 .974	.059 .571	.066 .526	.052 .622	-.156 .133	.080 .442	-.002 .987	
(9) Anger during scene Angry2	.055 .599	-.017 .874	.099 .342	.047 .650	-.034 .742	.059 .569	-.018 .866	.583 <.001

Note. $N = 94$. Significance tests are two-tailed.

Table 2

Means, Standard Deviations, Minima, and Maxima of the Intensity of Emotions Displayed in the Six Selected Scenes as Measured by the Software FaceReader

	Intensity of emotions displayed								
	happy			sad			angry		
Scene	Mean (SD)	Min.	Max.	Mean (SD)	Min.	Max.	Mean (SD)	Min.	Max.
happy1	.12 (.21)	.00	.83	.16 (.23)	.00	.94	.03 (.09)	.00	.60
happy2	.10 (.19)	.00	.82	.10 (.16)	.00	.95	.03 (.10)	.00	.56
sad1	.03 (.10)	.00	.74	.18 (.19)	.00	.75	.04 (.10)	.00	.54
sad2	.04 (.09)	.00	.56	.13 (.16)	.00	.82	.05 (.13)	.00	.60
angry1	.01 (.02)	.00	.10	.16 (.17)	.00	.82	.05 (.12)	.00	.68
angry2	.02 (.06)	.00	.53	.20 (.21)	.00	.94	.05 (.12)	.00	.61

Note. The automated facial coding software FaceReader measures the intensity of facially expressed emotions. Each expression has a value between 0 and 1, indicating its intensity.
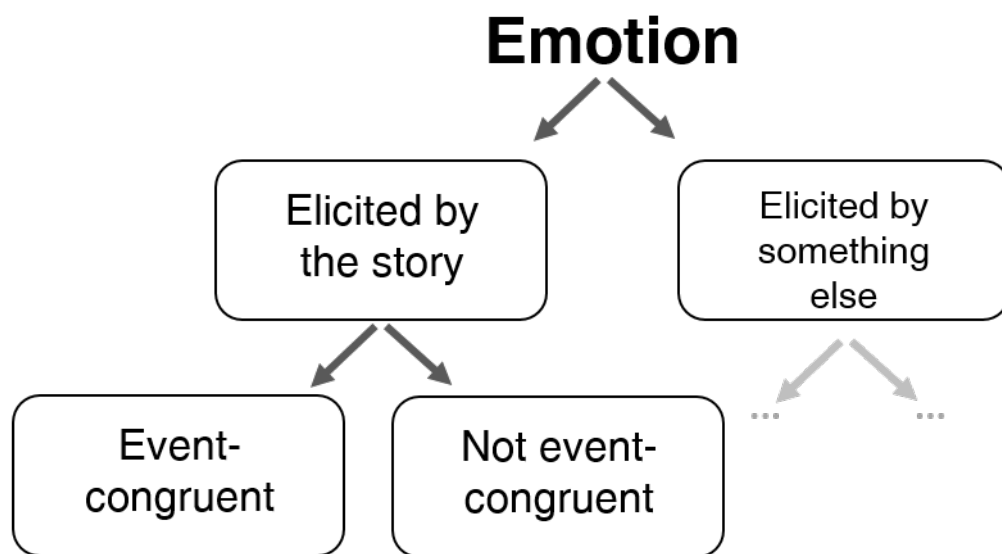
Figure 1. A taxonomy of emotional responses that can occur while following a story.
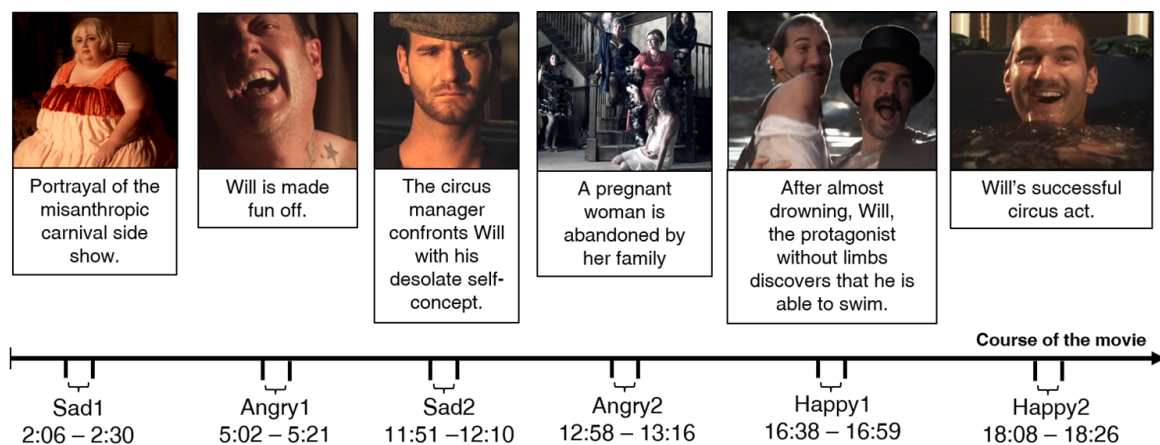
Figure 2. Overview of the position and content of the selected scenes within the movie that implied the experience of a specific primary emotion. The movie had a full length of 22:35 min. Screenshots printed with the permission of the copyright holders.
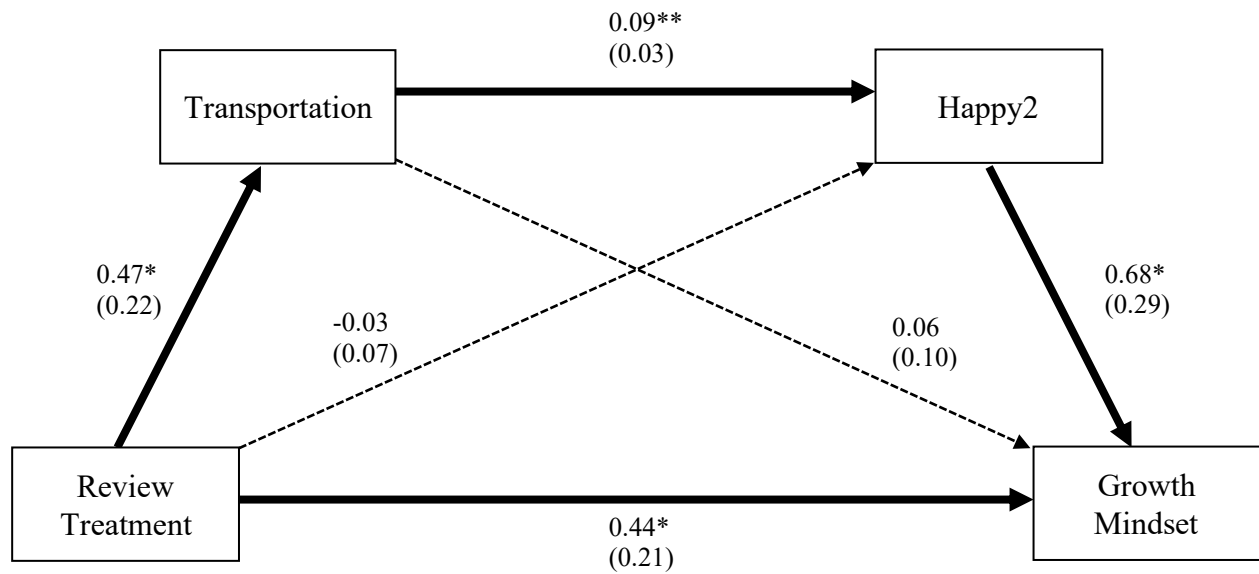
Figure 3. Results of a multi-mediator model (Hayes, 2013, model 6). The review treatment was coded with 0 for participants who read a negative review and 1 for participants who read a positive review. "Happy 2" describes the facially expressed happiness during the second happy scene selected by the three coders. Two-tailed significance tests. * $p < .05$, ** $p < .01$.

Online Supplement

The Mediating Role of Event-Congruent Emotions in Narrative Persuasion

S1: Movie reviews used in the manuscript

On the following pages the English translations of the reviews used in the experiment are presented along with the original German review versions.

Movie Critique – English positive

Butterfly Circus (2009)

Crew
Directed by   Joshua Weigel
Written by   Joshua Weigel & Rebekah Weigel
Producers   Joshua Weigel, Rebekah Weigel & Angie Alvarez

Cast
Mr. Mendez   Eduardo Verásegui
Will   Nick Vujicic
Otto   Doug Jones
George   Matt Allmen
Sammy   Conno Rosen
Anna   Lexi Pearl
Poppy   Bob Yerkes

Movie Critique (cinema.de, 28.6.2014)

Butterfly Circus is a wonderful movie about the hidden talents that each and every individual has. Director Joshua Weigel proves to have a seventh sense for the choice of actors. Nick Vujicic shines in his debut as an actor and succeeds in inducing sympathy, and even compassion. He plays his part so authentically that one feels the urge to intervene when bad things happen to him. The rest of the cast also fascinates each in their very own way. Eduardo Verastegui – to name but one – makes the viewer totally forget that he is only an actor. Quite in contrast, he draws the viewer under his magical spell and makes one believe again in human goodness.
Despite the short playtime, Butterfly Circus succeeds to evolve a plot that is coherent and engaging from beginning to end, without giving the viewer the impression of compressing a story as much as possible. Most movies of this type struggle to emotionally engage the viewer within minutes without rushing through the plot. Yet this movie is different: it emotionally draws you into the story and makes you ride an emotional rollercoaster. The movie is that touching that you do not want to leave the story world behind. It wants to bring a message across and brilliantly masters this purpose. The movie remains in one's mind as if it had charmed its viewers with its magic.
Fantastic images round out the movie. The landscape, the costumes, the colors – they form an ensemble that does not only confirm the general impression, but even adds to it.
Conclusion: Butterfly Circus with its wonderful message, the great actors and its high quality does not need to hide behind films for the big screen. Heartily recommended.

Community Rating

Movie Critique – English negative

Butterfly Circus (2009)

Crew
Directed by   Joshua Weigel
Written by   Joshua Weigel & Rebekah Weigel
Producers   Joshua Weigel, Rebekah Weigel & Angie Alvarez

Cast
Mr. Mendez   Eduardo Verásegui
Will   Nick Vujicic
Otto   Doug Jones
George   Matt Allmen
Sammy   Conno Rosen
Anna   Lexi Pearl
Poppy   Bob Yerkes

Filmkritik (cinema.de, 28.6.2014)

With Butterfly Circus, Joshua Weigels released a movie that serves as an example for great but unrealized potential. Butterfly Circus tells a story about the struggles of life, which keeps you realizing that it aims to engage the viewer, but has a hard time doing so. The challenge each short film must meet is to wrap up the plot in less than 30 minutes. Weigel creates a plot, but it seems highly condensed and insufficiently realized. Transitions are lacking, the viewer needs to mentally add them, which makes it hard to feel emotionally engaged by the events.

Maybe it is due to the second-class actors that Weigel's message does not come across to the viewer. Apparently, the film's budget was not sufficient to invest in better actors, and therefore, Weigel had to adapt his script. Many sentences of the dialogues are predictable – not to mention the obvious final turn of events.
The film does not emotionally engage the viewer. It rather seems like art that tries to be beautiful, but instead appears to have lost all sense of reality. If you try hard finding a message conveyed by the plot, you might succeed, however, the impression remains that the film could never be transferred into real life. Apparently, Weigel failed to establish a relation between his film and reality.

There must be a reason why the movie presentation at the film festival in Munich was cancelled and - after fierce criticism - the film was dropped off the list for the Munich movie award to be substituted by another film.
Conclusion: For someone who wants to watch a film with potential, it could be a good fit. However, if you have high standards for movies, you will not find what you are looking for. Bummer!

Community-Rating

Movie Critique – German positive

Butterfly Circus (2009)

Crew
Regisseur   Joshua Weigel
Drehbuch   Joshua Weigel & Rebekah Weigel
Produzenten   Joshua Weigel, Rebekah Weigel & Angie Alvarez

Besetzung
Mr. Mendez   Eduardo Verásegui
Will   Nick Vujicic
Otto   Doug Jones
George   Matt Allmen
Sammy   Conno Rosen
Anna   Lexi Pearl
Poppy   Bob Yerkes

Filmkritik (cinema.de, 28.6.2014)

Butterfly Circus ist ein wunderbarer Film über die verborgenen Talente, die jeder einzelne Mensch besitzt. Dabei hat der Regisseur Joshua Weigel seinen siebten Sinn für die Zusammensetzung der Schauspieler bewiesen. Nick Vujicic glänzt in seinem Schauspieldebüt und schafft es, den Zuschauer mitfühlen, ja mitleiden zu lassen. Er spielt seine Rolle so authentisch, dass man geradezu das Gefühl verspürt, eingreifen zu wollen, wenn ihm schlechtes widerfährt. Aber auch die anderen Schauspieler faszinieren auf ihre ganz besondere Art. Eduardo Verastegui – um hier nur einen zu nennen – lässt den Zuschauer völlig vergessen, dass er nur ein Schauspieler ist, im Gegenteil, er zieht den Zuschauer in seinen Bann und lässt einen wieder an das Gute im Menschen glauben.

Trotz der kurzen Spielzeit schafft es Butterfly Circus eine Handlung zu schaffen, die von vorne bis hinten schlüssig und fesselnd ist, ohne dem Zuschauer dabei das Gefühl zu geben, eine Geschichte möglichst komprimiert wiedergeben zu wollen. Die meisten Filme dieser Art tun sich schwer damit, den Zuschauer innerhalb von Minuten emotional anzusprechen, ohne die Handlung schnell abspulen zu lassen. Bei diesem Film ist das hingegen anders: Man folgt der Handlung emotional und erlebt damit ein Wechselbad der Gefühle. Man möchte die Welt der Geschichte gar nicht mehr verlassen, so berührt einen der Film. Er möchte eine Botschaft überbringen und schafft dies mit Bravour. Der Film nimmt einen noch lange danach mit als wäre man durch diesen Film wie verzaubert.

Abgerundet wird dieser Film durch fantastisch ausgewählte Bilder. Die Landschaft, die Kostüme, die Farben – sie alle ergeben ein Ensemble, das den Gesamteindruck nicht nur bestätigt, sondern obendrein noch weiter verbessert.
Fazit: Butterfly Circus braucht sich mit seiner wunderbaren Botschaft, tollen Schauspielern und hoher Qualität hinter den Kinofilmen nicht zu verstecken. Unbedingt empfehlenswert!

Community-Bewertung

Movie Critique – German negative

Butterfly Circus (2009)

Crew
Regisseur   Joshua Weigel
Drehbuch   Joshua Weigel & Rebekah Weigel
Produzenten   Joshua Weigel, Rebekah Weigel & Angie Alvarez

Besetzung
Mr. Mendez   Eduardo Verásegui
Will   Nick Vujicic
Otto   Doug Jones
George   Matt Allmen
Sammy   Conno Rosen
Anna   Lexi Pearl
Poppy   Bob Yerkes

Filmkritik (cinema.de, 28.6.2014)

Mit Butterfly Circus bringt Joshua Weigel einen neuen Film raus, der gut demonstriert, wie man großes Potential schlecht umsetzen kann. Butterfly Circus erzählt eine Handlung über die Hürden des Lebens, bei der man immer wieder merkt, dass sie den Zuschauer mitnehmen will, es aber nicht so recht schafft. Die Schwierigkeit eines Kurzfilms ist, eine Handlung in weniger als 30 Minuten zu verpacken. Eine Handlung gibt Weigel dem Film zwar, doch wirkt sie eben sehr komprimiert und schlecht umgesetzt. Übergänge fehlen, die sich der Zuschauer denken muss und es schwer machen, sich emotional auf die Geschehnisse einzulassen.

Vielleicht sind die zweitklassigen Schauspieler dafür verantwortlich, dass Weigels Botschaft nicht beim Zuschauer ankommen will. Die finanziellen Mittel reichten scheinbar nicht für bessere Schauspieler, und so musste Weigel sein Drehbuch an sie anpassen. Viele Sätze der Dialoge sind vorhersehbar – ganz zu schweigen von dem so offensichtlichen Ende.
Der Film lässt den Zuschauer emotional kalt. Er wirkt eher wie Kunst, die versucht, schön zu sein, aber dadurch völlig abgehoben erscheint und den Bezug zu jeglicher Realität aus den Augen verliert. Nach tiefer Suche in die Handlung des Films lässt sich vielleicht der Hauch einer Botschaft darin erkennen, jedoch hat man das Gefühl, dass der Film so nie auf das reale Leben übertragbar ist. Weigel ist hier offensichtlich an dem Versuch gescheitert, seinen Film mit der Realität zu verbinden.

Es wird einen Grund geben, warum die Präsentation des Films auf dem Filmfestival in München abgesagt wurde und er auf der Nominationsliste für dessen Preis nach heftiger Kritik Platz für einen besseren Film machen musste.
Fazit: Wer sehen möchte, wie ein Film mit Potenzial aussieht, ist hier richtig. Wer aber Anspruch an einen Film hat, wird hier leider nicht fündig. Schade!

Community-Bewertung

Figure S2.

Means and standard errors for the intensity of facially expressed happiness across the six scenes that implied specific primary emotions
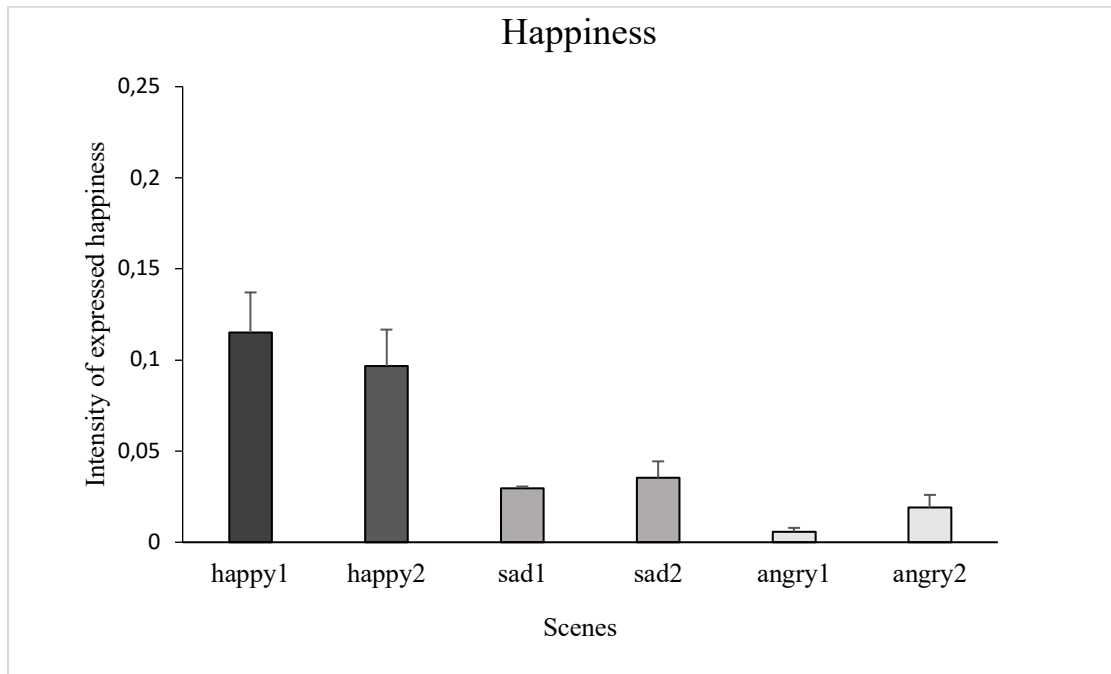
Figure S3.

Means and standard errors for the intensity of facially expressed sadness across the six scenes that implied specific primary emotions.
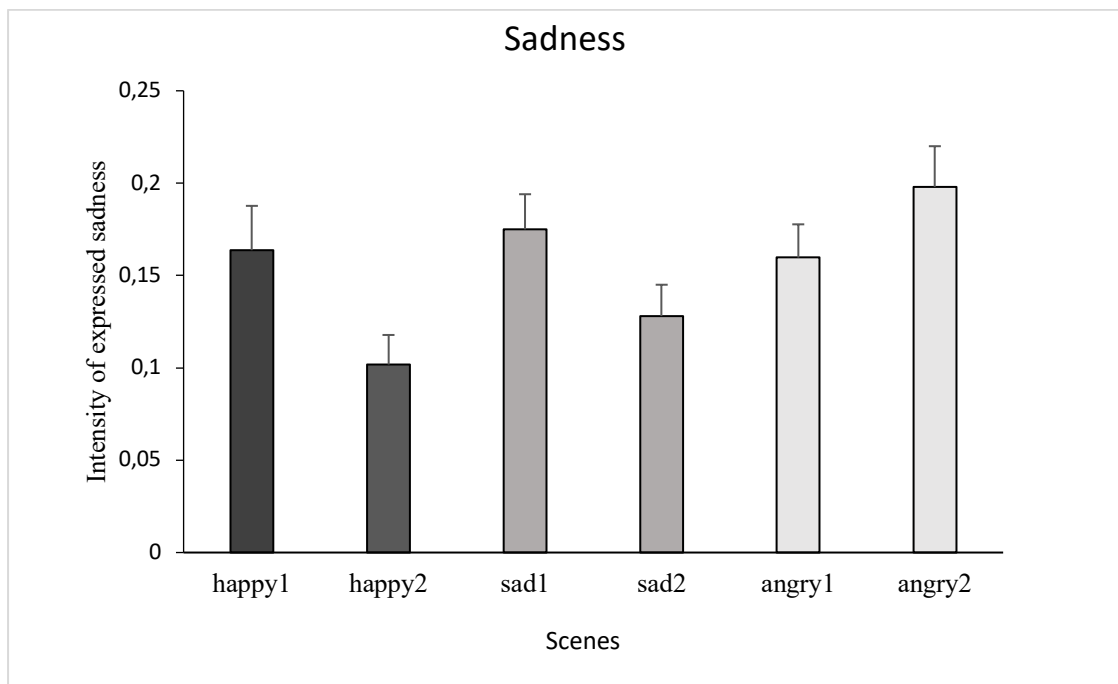
Table S4. Results of a two-step mediation analysis: Mean of happiness at both happy scenes as the second mediator

Results of a multi-mediator-analysis (Hayes, 2013; Model 6).
Independent variable = Review treatment (0 = negative review; 1 = positive review) Dependent variable = Growth mindset
Mediator 1= Transportation
Mediator 2 = Mean of happiness at both happy scenes

	Effect	Standard Error	Boot 95% CI LL	Boot 95% CI UL	t	p
Total effect	.479	.209	.065	.893		.024
Direct Effect	.438	.212	.017	.858		.042
Paths						
Treatment -> Transportation	.467	.224	.022	.911		.040
Treatment -> ECE Happiness (both happy scenes)	-.019	.036	-.091	.053		.601
Transportation -> ECE Happiness (both happy scenes)	.038	.017	.006	.071		.022
Transportation -> Growth mindset	.090	.099	-.107	.287		.365
ECE Happiness (both happy scenes) -> Growth mindset	.883	.613	-.335	2.101		.153
Indirect effects						
Treatment -> Transportation -> Growth Mindset	.042	.071	-.053	.250		
Treat -> ECE Happiness (both happy scenes) -> Growth Mindset	-.017	.046	-.167	.028		
Treat -> Transportation -> ECE Happiness (both happy scenes) -> Growth Mindset	.016	.015	.0000	.069		

Table S5. Results of a two-step mediation analysis: Happiness at scene happy 1

Results of a multi-mediator-analysis (Hayes, 2013; Model 6).
Independent variable = Review treatment (0 = negative review; 1 = positive review) Dependent variable = Growth mindset
Mediator 1= Transportation
Mediator 2 = Happiness at scene "happy 1"

	Effect	Standard Error	Boot 95% CI LL	Boot 95% CI UL	t	p
Total effect	0.479	0.209	0.065	0.893	2.30	.024
Direct Effect	0.424	0.213	0.001	0.848	1.99	.0497
Paths						
Treatment -> Transportation	0.467	0.224	0.022	0.911	2.09	.040
Treatment -> ECE Happiness (scene happy 1)	-0.018	0.081	-0.178	0.143	-0.216	.829
Transportation -> ECE Happiness (scene happy 1)	0.087	0.037	0.014	0.160	2.36	.021
Transportation -> Growth mindset	0.108	0.100	-0.091	0.307	1.08	.284
ECE Happiness (scene happy 1) -> Growth mindset	0.186	0.277	-0.364	0.735	0.67	.504
Indirect effects						
Treatment -> Transportation -> Growth Mindset	.050	.074	-.048	.260		
Treatment -> ECE Happiness (scene happy 1) -> Growth Mindset	-.003	.027	-.088	.031		
Treatment -> Transportation -> ECE Happiness (scene happy 1) -> Growth Mindset	.008	.013	-.007	.052		

Table S6. Results of a two-step mediation analysis: Happiness at scene happy 2 as the second mediator

Results of a multi-mediator-analysis (Hayes, 2013; Model 6).
Independent variable = Review treatment (0 = negative review; 1 = positive review) Dependent variable = Growth mindset
Mediator 1= Transportation
Mediator 2 = Happiness at scene "happy 2"

	Effect	Standard Error	Boot 95% CI LL	Boot 95% CI UL	*t*	*p*
Total effect	0.479	0.209	0.065	0.893	2.30	.024
Direct Effect	0.441	0.208	0.028	0.834	2.12	.037
Paths						
Treatment -> Transportation	0.467	0.224	0.022	0.911	2.09	.040
Treatment -> ECE Happiness (scene happy 2)	-0.029	0.075	-0.177	0.119	-0.39	.700
Transportation -> ECE Happiness (scene happy 2)	0.094	0.034	0.027	0.161	2.77	.007
Transportation -> Growth mindset	0.060	0.099	-0.136	0.256	0.61	.544
ECE Happiness (scene happy 2) -> Growth mindset	0.681	0.292	0.101	1.261	2.33	.022
Indirect effects						
Treatment -> Transportation -> Growth Mindset	.028	.069	-.073	.225		
Treatment -> ECE Happiness (scene happy 2) -> Growth Mindset	-.020	.057	-.168	.074		
Treatment -> Transportation -> ECE Happiness (scene happy 2) -> Growth Mindset	.030	.022	.004	.104		

Table S7. Results of a two-step mediation analysis: Sadness at scene happy 1 as the second mediator (additional analysis)

Results of a multi-mediator-analysis (Hayes, 2013; Model 6).
Independent variable = Review treatment (0 = negative review; 1 = positive review) Dependent variable = Growth mindset
Mediator 1= Transportation
Mediator 2 = Sadness at scene "happy 2"

	Effect	Standard Error	Boot 95% CI LL	Boot 95% CI UL	*t*	*p*
Total effect	0.479	0.209	0.065	0.893	2.30	.024
Direct Effect	0.370	0.210	-0.047	0.786	1.76	.081
Paths						
Treatment -> Transportation	0.467	0.224	0.022	0.911	2.09	.040
Treatment -> Sadness	-0.036	0.034	-0.103	0.031	-1.07	.286
Transportation -> Sadness	-0.006	0.015	-0.036	0.025	-0.37	.710
Transportation -> Growth mindset	0.116	0.095	-0.073	0.305	1.22	.226
Sadness -> Growth mindset	-1.414	0.645	-2.696	-0.132	-2.19	.031
Indirect effects						
Treatment -> Transportation -> Growth Mindset	.054	.068	-.031	.262		
Treatment -> Sadness -> Growth Mindset	.051	.056	-.042	.183		
Treatment -> Transportation -> Sadness -> Growth Mindset	-.004	.013	-.010	.050		

Table S8. Results of a two-step mediation analysis: Poignancy as the second mediator (additional analysis)

Results of a multi-mediator-analysis (Hayes, 2013; Model 6).
Independent variable = Review treatment (0 = negative review; 1 = positive review) Dependent variable = Growth mindset
Mediator 1= Transportation
Mediator 2 = Poignancy: Minimum of happiness and sadness at scene "happy 2"

	Effect	Standard Error	Boot 95% CI LL	Boot 95% CI UL	t	p
Total effect	0.479	0.209	0.065	0.893	2.30	.024
Direct Effect	0.414	0.217	-0.017	0.844	1.91	.060
Paths						
Treatment -> Transportation	0.467	0.224	0.022	0.911	2.09	.040
Treatment -> Poignancy	-0.017	0.011	-0.038	0.004	-1.62	.109
Transportation -> Poignancy	.011	0.005	0.002	0.021	2.32	.023
Transportation -> Growth mindset	0.129	0.100	-0.070	0.328	1.29	.202
Poignancy -> Growth mindset	-0.446	2.124	-4.665	3.774	-0.21	.834
Indirect effects						
Treatment -> Transportation -> Growth Mindset	.060	.074	-.036	.273		
Treatment -> Poignancy -> Growth Mindset	.008	.048	-.041	.126		
Treatment -> Transportation -> Poignancy -> Growth Mindset	-.002	.014	-.040	.022		

Table S9. Results of a two-step mediation analysis: Change score as the second mediator (additional analysis)

Results of a multi-mediator-analysis (Hayes, 2013; Model 6).
Independent variable = Review treatment (0 = negative review; 1 = positive review) Dependent variable = Growth mindset
Mediator 1= Transportation
Mediator 2 = Change score: Happiness at scene "happy2" minus happiness at scene "angry2"

	Effect	Standard Error	Boot 95% CI LL	Boot 95% CI UL	*t*	*p*
Total effect	0.479	0.209	0.065	0.893	2.30	.024
Direct Effect	0.370	0.210	-0.047	0.786	1.76	.081
Paths						
Treatment -> Transportation	0.467	0.224	0.022	0.911	2.09	.040
Treatment -> Change score	-0.059	0.045	-0.148	0.030	-1.32	.191
Transportation -> Change score	0.038	0.020	-0.026	0.078	1.86	.067
Transportation -> Growth mindset	0.093	0.098	-0.102	0.287	0.95	.346
Change score -> Growth mindset	0.831	0.493	-0.149	1.811	1.68	.096
Indirect effects						
Treatment -> Transportation -> Growth Mindset	.043	.067	-.045	.236		
Treatment -> Change score -> Growth Mindset	-.049	.061	-.230	.013		
Treatment -> Transportation -> Change score -> Growth Mindset	.015	.019	-.002	.094		