The Experience of Emotional Shifts as a Narrative Process:

Investigating the Relationship of Emotional Shifts and Transportation and Their Roles in Narrative Persuasion

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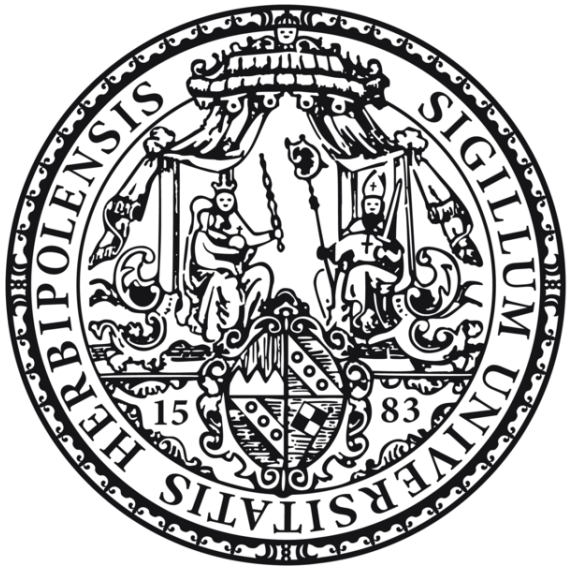

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Abstract

Emotional shifts are often a fundamental part of the narrative experience and engrained into the schematic structures of stories. Recent theoretical work suggests that these shifts are key for narrative influence and are interconnected with transportation, a known mechanism of narrative effects. Empirical research examining this proposition is still scarce, inconclusive, and lacking measures that assess the experience of emotional shifts throughout a narrative to explain effects. This thesis aims to contribute to this research lacuna and investigates the link between emotional shifts, transportation, and story-consistent outcomes using different methods to measure emotional shifts in the moment they occur (Manuscript #1 and #2), and using various narrative stimuli (audiovisual, written, auditive).

Manuscript #1 uses real-time-response (RTR) measurement to examine the relationship of valence shifts experienced during film viewing with transportation and post-exposure self-reported emotional flow. Manuscript #2 reports a pilot study and two experiments in which a self-probed emotional retrospection task is used to measure the number and intensity of emotional shifts during reading. I investigate the effect of reviews on transportation, the link between transportation and emotional shifts, and their respective associations with story-consistent attitudes, social sharing intentions, and donation behavior. In Manuscript #3, narrative structures are manipulated. Two experiments examine the effects of audio stories with shifting (positive-negative-positive) vs. positive-only emotional trajectories on the experience of happiness- and sadness-shifts, transportation, and post-exposure emotional flow.

Transportation was positively linked to valence shifts (M#1), and the number and intensity of emotional shifts (M#2), and emotional flow (M#1, M#3). In M#3, transportation was predicted by shifts in happiness, but not sadness. Emotional flow was linked to shifts in happiness, sadness, and RTR valence (M#1, M#3). Emotional shifts and transportation were associated with social sharing intentions, but only transportation was linked to some story-consistent attitudes (affective attitudes in particular).

Zusammenfassung

Dynamisches emotionales Erleben ist oft charakteristisch für die Rezeption von Geschichten. Aktuelle theoretische Arbeiten postulieren, dass diese emotionalen Wechsel für den Einfluss von Narrationen entscheidend und mit Transportation, einem bekannten Mechanismus für narrative Wirkungen, verflochten sind. Empirische Evidenz zu dieser These ist noch rar, inkonsistent, und es kommt meist kein Prozessmaß emotionaler Wechsel zum Einsatz, um Effekte zu erklären. Die vorliegende Arbeit soll einen Beitrag zu dieser Forschungslücke leisten und untersucht den Zusammenhang zwischen emotionalen Wechseln, Transportation und persuasiven Wirkungen unter Verwendung verschiedener Stimuli (audiovisuell, schriftlich, auditiv) und Methoden zur Messung emotionaler Veränderungen im Moment ihres Auftretens (Manuskript 1 und 2).

Manuskript #1 verwendet Real-Time-Response Messung (RTR) zur Untersuchung der Beziehung zwischen Valenzverschiebungen während der Filmrezeption, Transportation und retrospektiv selbstberichtetem Emotional Flow. Manuskript #2 berichtet eine Pilotstudie und zwei Experimente, die eine Self-Probed Emotional Retrospection Task zur Messung der Anzahl und Intensität emotionaler Wechsel während des Lesens verwenden. Die Experimente untersuchen die Wirkungen einer Rezensions-Manipulation auf Transportation sowie die Zusammenhänge zwischen Transportation, emotionalen Wechseln, Einstellungen, Absichten zum sozialen Teilen und Spendenverhalten. In Manuskript #3 werden Erzählstrukturen manipuliert. In zwei Experimenten werden die Wirkungen auditiver Geschichten mit wechselnden (positiv-negativ-positiv) bzw. nur positiven Strukturen auf erlebte Veränderungen von Freude und Trauer, Transportation, und Emotional Flow untersucht.

Transportation stand in positivem Zusammenhang mit Valenzverschiebungen (M#1), der Anzahl und Intensität emotionaler Wechsel (M#2) und Emotional Flow (M#1, M#3). In M#3 wurde Transportation durch Veränderungen von Freude, aber nicht Trauer vorhergesagt. Emotional Flow war mit Veränderungen von Freude, Trauer und RTR-Valenzverschiebungen

korreliert (M#1, M#3). Mehr und intensivere emotionale Wechsel und Transportation gingen mit einer erhöhten Absicht einher, Inhalte zu teilen bzw. über Inhalte zu reden. Nur Transportation war jedoch mit einigen der untersuchten (insbesondere affektiven) Einstellungen assoziiert.

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1 Introduction

Stories are a fundamental part of human culture. According to Donald (1991), narratives are "the natural product of language itself" (p. 257) and have been used as a way of organizing information for millennia. They are not merely a vehicle for entertainment, but provide people with a means to make sense of the world, enhance social understanding, and can shape-real life attitudes (Bruner, 1986, 1990; Green et al., 2020).

The ubiquity and cultural meaning of narratives in the present day can be expressed in numbers: In Germany, watching films or series is one of the most popular free time activities. In 2021, 44.1% of the German speaking population over the age of 14 engaged in watching films or series multiple times a month. The amount of people who do so multiple times a week has increased considerably over the last years (from 3.64 million in 2017 to 16.66 million in 2021), arguably due to the availability of streaming services like Netflix or Amazon Prime, which are used by 32.9% of people (Arbeitsgemeinschaft Verbrauchs- und Medienanalyse, 2022). Narratives are also an integral part of the linear television program. On average, the fictional entertainment section makes up for almost a third (29.8%) of the airtime among the six dominating TV channels in Germany (Das Erste, ZDF, RTL, VOX, Sat.1, ProSieben) during prime time (i.e., between 6 pm and midnight; Maurer et al., 2022).

Similarly, fictional books made up for about one third (31.9%, not including children's and youth literature) of the 2021 German publishing industry's annual turnover (Börsenverein des Deutschen Buchhandels, 2022). Reading books is among the most popular free time activities, with 40.4% of the German speaking population in Germany over the age of 14 engaging in this activity multiple times a month (Arbeitsgemeinschaft Verbrauchs- und Medienanalyse, 2022).

Emotions are at the heart of narrative experiences and a fundamental reason why audiences seek out stories. "We read and watch fiction because we want to be moved by it" (Oatley, 2012, p. 16). Due to their emotional appeal, narrative entertainment has long been used

as a means of influencing beliefs and attitudes (e.g., for propaganda, Lazarsfeld & Merton, 1943; entertainment education, Sabido, 2004). The assumed power of stories to grab attention, enhance learning, influence attitudes, or change behavior is also highlighted by the use of narratives in domains that are not traditionally considered entertainment media, such as health communication (Hoeken & den Ouden, 2019), advertising (e.g., Ball & Applequist, 2019; Martínez-Navarro & Bigné, 2022), and narrative techniques in journalism (e.g., Matei & Hunter, 2021; Nee & Santana, 2022).

In the past two to three decades, media psychology and communication scholarship has taken an increased interest in the systematic study of the processes underlying narrative effects. Several theoretical approaches have been developed to explain the mechanisms through which narratives might shape audiences' beliefs, attitudes, and behaviors (Busselle & Bilandzic, 2008; Green & Brock, 2002; Moyer-Gusé, 2008; Slater & Rouner, 2002). Across these models, transportation into the story world (Gerrig, 1993; Green & Brock, 2000; or similar constructs, e.g., narrative engagement; Busselle & Bilandzic, 2008; story world absorption; Kuijpers et al., 2014) has been deemed a key variable for the processing of narratives and for narrative persuasion to occur (Green et al., 2020).

The recent work by Nabi and Green (2015; see also Nabi, 2015) draws attention to the emotional shifts audiences experience in response to stories. As audiences follow the journey of the protagonist, they typically move through a series of different emotions. They may experience fear if beloved characters are threatened by danger, anger if they are affected by injustice, and joy if the story culminates in the desired happy ending (or sadness if it does not). Nabi and Green suggest that emotional shifts play a key role for narrative influence by attracting audiences to stories, reinforcing narrative processes like transportation, and increasing the likelihood for persuasive outcomes and different post-exposure engagement variables. Even though narrative theory has long argued that emotional experiences and narrative engagement

are intertwined (e.g., Carroll, 1997; Oatley, 1995; Tan, 1996), empirical research examining this link is scarce.

Arguably, this may be due to the methodological challenges associated with the investigation of this relationship. Most importantly, examining the link between emotional shifts and transportation requires to collect emotion data during multiple points of the story without interrupting the narrative experience. To disentangle causal effects of each variable, studies need to experimentally manipulate the experience of emotional shifts and transportation. Furthermore, the emotional shifts concept lends itself to many different operationalizations of emotional shifts. Best practices and research paradigms have yet to develop in terms of experimental manipulations, operationalization, measurement, and analysis strategies when investigating emotional shifts.

In this thesis, I examine the link between emotional shifts evoked by narratives and transportation into story worlds, as well as how these processes are linked with story-consistent attitudes, behavior, and social sharing intentions. To this end, I report seven studies in three manuscripts that investigated these research questions across a diverse set of narrative stimuli, which varied in terms of genre, topic, and presentation mode, and using different approaches to measure emotional shifts. The studies further include experimental manipulations of transportation (Manuscript #2) and emotional shifts (Manuscript #3) to investigate causal effects of these processes.

In the first section of this thesis, I will describe the theoretical and methodological underpinnings of this thesis. I will start with some basic concepts: First I clarify what narratives are and how their typical structures can be described (2). Next, I will describe how the experience of getting lost in the world of a story has been theoretically conceptualized in terms of transportation or narrative engagement (3), before I expound on the emotion-eliciting potential of narratives (4). Chapter 5 will describe further how narratives can shape real-world beliefs, attitudes, and behaviors, as well as the role of transportation (5.1) and emotions (5.2)

for narrative effects. In Chapter 6 I will describe the emotional shifts framework (Nabi & Green, 2015) that this thesis builds on. I will lay out how emotional shifts are argued to influence transportation and story-consistent outcomes during message processing (6.1.1) in more detail, as well as how transportation might influence the experience of emotional shifts (6.1.2). Chapter 6.2 explains how emotional shifts might play a role for post-message engagement in the form of social sharing, and Chapter 6.3 goes into detail about methodological challenges associated with and options for the measurement of emotional shifts as a narrative process. Finally, I will summarize the empirical evidence and identify open questions regarding the role of emotional shifts as a narrative process (6.3), before I lay out the aims and contributions of the research presented in this thesis (7). The second section of this thesis (8-9) presents the three manuscripts, along with their respective supplementary materials. For each manuscript, the underlying data and stimulus materials can be found in an online OSF project (the links are provided on the title page of each manuscript). The stimulus material for Manuscript #3 can also be found in its corresponding supplement. Finally, I summarize and discuss the findings, limitations of this research, as well as some avenues for future research (11).

2 Narratives and Narrative Structures

Narratives or stories (I will use both terms synonymously) can be defined as representations of causally linked events that unfold over time (Abbott, 2008; Dahlstrom, 2014; Kreuter et al., 2007). They center around characters who have goals and intentions, experience emotions, and who have an impact on the story events (Fludernik, 2009).

Narratives have typical structures which have been described by narrative theory. On the most basic level, the structure of narratives can be described as having a beginning, a middle, and an end (Field, 2005). Conflict and resolution are core characteristics of narratives (Hinyard & Kreuter, 2007). Usually, the protagonist faces some type of adversity or challenge, and the narrative then follows the protagonist's journey attempting to overcome these challenges.

Narratives are designed to move their audiences through different emotions. The earliest account of this idea dates back to Aristotle, who described the rules of constructing tragic drama in the *Poetics* (ca. 350 B.C.E./1994). According to Aristotle, the function of tragic drama was the creation of cathartic release through the evocation of pity and fear. In order to achieve that, Aristotle emphasized the role of *peripeteia*, "a change by which the action veers round to its opposite" (Part XI). Peripeteia constitutes a turning point in the story in which the protagonist's fate turns from good to bad, or vice versa. This idea is also reflected in Freytag's (1905) classic five-act dramatic structure, comprising of exposition, rising action, climax, falling action, and resolution. In this structure, the story includes several turning points that represent a change of fortune for the protagonist.

Vonnegut (1981) has proposed that the emotional journey of the protagonist over the course of a narrative can be represented by typical shapes, which can be detected through computational analysis. These shapes can be mapped in a two-dimensional space along the axis of time (story progression) and the protagonist's well-being (ranging from good fortune to ill-fortune). For example, in stories with a *Man in a Hole* structure "somebody gets into trouble, [then] gets out of it again" (Comberg, 2010, 1:25).

Taking advantage of computational methods and the accessibility of large text corpora, newer research has taken to reveal the common structural patterns of stories described by narrative theory. For example, Boyd and colleagues (2020) found that the narrative structure of fictional stories such as novels, short stories, or movie dialogue followed a consistent pattern: Setting of the stage in the beginning coupled with a rise of cognitive tension, followed by an increase in plot progression, and a fall of cognitive tension towards the end (see also Cutting, 2016). A similar pattern was also found in non-fictional texts employing narrative elements (e.g., TED talks, or science reporting in newspaper articles; Boyd et al., 2020). In addition, sentiment analyses of books (Reagan et al., 2016) and movie scripts (del Vecchio et al., 2021)

have found evidence of Vonnegut's (1981) proposition that the emotional arcs of stories generally follow one of a few basic shapes.

Thus, it is evident that dynamic emotions are a core feature of stories on the level of the text. By entering the story world, audiences become susceptible to these emotional ups and downs and may experience various narrative emotions (Green & Brock, 2002; see Mar et al., 2011; Oatley, 1995). In the next sections, I will describe how this experience of transportation has been conceptualized as a narrative experience and some factors that have been identified to influence transportation.

3 Entering the Story World: The Experience of Transportation

As people read a book or watch a movie, they commonly experience a state of complete immersion into the narrative world, a sense of getting swept up by the story and forgetting the world around them (Gerrig, 1993; Nell, 1988). This experience is considered to be a key variable of narrative processing and is at the heart of several theoretical approaches to explain how narrative effects occur (e.g., *Model of Narrative Comprehension and Engagement*; Bilandzic & Busselle, 2008; *Transportation-Imagery Model*; Green & Brock, 2002). Depending on the theoretical framework, different terms are used to describe this process, for example, *transportation* (Green & Brock, 2002; *narrative engagement* is a very similar concept, Busselle & Bilandzic, 2008).

The term transportation has been coined by Gerrig (1993), who used the metaphor of the reader as a traveler to describe this experience:

> i. Someone ('the traveler') is transported, 2. by some means of transportation, 3. as a result of performing certain actions. 4. The traveler goes some distance from his or her world of origin, 5. which makes some aspects of the world of origin inaccessible. 6. The traveler returns to the world of origin, somewhat changed by the journey. (p. 10-11)

This metaphor highlights some of the key assumptions underlying the concept of

transportation: Transportation is understood as an active process on the side of the reader, in which narratives are used as vehicles for readers to enter the narrative world. Transportation involves presence, that is, a sense of "being there" (Biocca, 2002) in the world of the story, and temporarily forgetting the real world around oneself. It further points to the transformative effects of this journey on the reader.

Building on this metaphor, Green and Brock (2002) define transportation "as a convergent process, where all of the person's mental systems and capacities become focused on the events occurring in the narrative" (p. 324). Transportation is characterized by strong attentional focus on the narrative and the experience of vivid imagery (Green & Brock, 2000). Busselle and Bilandzic's (2008, 2009) concept of or *narrative engagement* (consisting of the components of narrative understanding, attentional focus, emotional engagement, and narrative presence, Busselle & Bilandzic, 2009) is very similar.

Both Green and Brock (2002) and Busselle and Bilandzic (2008) conceptualize transportation as a state similar to flow, in which audiences become completely absorbed by the story and lose track of time and self (Csíkszentmihályi, 1990). As such, transportation is perceived as a pleasurable state that people typically are motivated to sustain. Busselle and Bilandzic (2008) add that transportation involves constructing mental models of the story, which are continually updated as the story evolves, and which form the basis for narrative comprehension and forming expectations about the unfolding events. They further stress that in order to experience transportation, audiences must perform a "deictic shift" (Segal, 2002), in which the world of the narrative becomes their frame of reference, and that this enables them to engage in perspective-taking with characters.

Research has identified several variables that affect the intensity of transportation experiences (see van Laer et al., 2014). Some of these variables relate to properties of the text itself, others to characteristics of the recipient, or to external factors. Prior experience with the topic of the story has been related to higher transportation (Green, 2004). Personality traits also

play a role for the likelihood of experiencing transportation, such as need for affect (Appel & Richter, 2010), sensation seeking and viewers' empathy (Thompson et al., 2018), or a person's openness to experience and general disposition to become transported into narratives (Bilandzic & Busselle, 2008; Mar et al., 2009; Mazzocco et al., 2010).

Regarding features of the text, Gnambs et al. (2014) found transportation to be reduced if the order of events in the story was mixed up (low narrativity). Furthermore, the artistic quality of story (a story that is "told well") can increase the perceived verisimilitude and narrative realism (the extent to which narrative events are perceived as coherent and make sense within the story world logic) and thereby increase transportation (Bilandzic & Busselle, 2011; Green, 2004; Kreuter et al., 2007). On the other hand, the intensity of transportation experiences does not seem to depend on genre (Thompson et al., 2018), or fictionality (Busselle & Bilandzic, 2008; Green & Brock, 2000).

Some studies have found that transportation or narrative engagement can also be influenced by factors other than the text (Tukachinsky, 2014), such as reading goals (Green & Brock, 2000), a distraction task (e.g., Bilandzic & Sukalla, 2019), or reviews by peers or a literary critic, presented prior to the story (e.g., Tiede & Appel, 2020). Reviews especially have emerged as a promising strategy to experimentally manipulate transportation while keeping the experimental material itself identical and several studies have successfully shown that transportation can be increased by positive reviews, or decreased by negative reviews (Gebbers et al., 2017; Isberner et al., 2019; Shedlosky-Shoemaker et al., 2011; Tiede & Appel, 2020). Tiede and Appel (2020) identify the expectations that are created in audience members through reviews as the underlying mechanism of this effect. Based on Tan (Tan, 1996, 2008), they argue that the motivation of audiences to invest cognitive and emotional resources into the processing of narratives (or any media stimulus) depends on the gratifications they expect from that experience. Transportation is an active process on the side of the recipient, but one that is experienced as intrinsically gratifying and pleasurable (Green & Brock, 2002; Green et al.,

2004). Thus, if people expect a high-quality story, they are more likely to be interested, willing to invest more resources, and be more likely to experience transportation. Furthermore, confirmation bias (Nickerson, 1998) is argued to play a role for the influence of reviews on transportation. As a result of expectations raised by a review, audiences' attention might be drawn selectively to those features of a narrative that align with these expectations.

4 Narratives as Elicitors of Emotions

4.1 What are Emotions?

Defining what emotions are is an ongoing debate among emotion scholars (e.g., Frijda, 2008; Kleinginna & Kleinginna, 1981; Mulligan & Scherer, 2012). A commonly used definition describes emotions as "valenced reactions ... [to] events, agents, or objects" (Ortony et al., 1988, p. 18). Emotions are episodic (i.e., they have a beginning and an end) and comparatively short lived (Scherer, 2001). Furthermore, a view that is relatively consensual is that emotions are made up of components (Kleinginna & Kleinginna, 1981; Scherer, 2009). According to Scherer's (1984, 2001) componential model, emotions result from an appraisal of a situation as relevant (cognitive component). This evaluation in turn leads to an emotional response that includes physiological arousal, the subjective experience (feeling) of emotion, a motivational component (as emotions usually go hand in hand with the urge to act in some way or another), and motor expression (e.g., facial expressions, gestures).

Emotions can be distinguished from other related concepts such as moods, sentiments, or feelings. Moods are generally understood as more diffuse affective states that are experienced over longer periods of time, without being directed at one particular target (e.g., Mulligan & Scherer, 2012). Sentiments refer to dispositional affective states (e.g., being scared of dogs, as opposed to experiencing fear in response to a dog; Frijda, 2008). Feelings, although often used synonymously to the term emotion, are thought of as a component of emotion and refer to the subjective experience of emotion (Scherer, 1984, 2001).

Emotion theories differ in many different ways and are often clustered in families, based on shared assumptions regarding their postulated functions, origins, or underlying processes (Barrett, 2016; Wirth & Schramm, 2005). Appraisal theories of emotion constitute a group of theories that have found comparatively wide acceptance within emotion psychology (Scherer, 2009). They view emotions as a result of cognitive evaluations (appraisals) of circumstances or elements in the environment (Frijda, 2007; Lazarus, 1991; Oatley & Johnson-Laird, 1987; Ortony et al., 1988; Scherer, 2001). The evaluative dimensions by which events, agents, or objects are appraised differ between theories, but commonly postulated dimensions are for example novelty, pleasantness or desirability, goal significance, predictability, compatibility with personal norms and values (Ellsworth & Scherer, 2003). Many appraisal theories view emotions as processes, which is reflected in the idea that several appraisals occur sequentially, and that the emotional experience may change during each new appraisal step (Scherer, 1984). In a first appraisal step, an orienting response takes place, in which a novel stimulus attracts the organism's attention. If the stimulus is appraised as relevant to its well-being, subsequent appraisals take place, for example, in terms of the stimulus' pleasantness. Particularly for negative evaluations, further appraisals occur (e.g., with respect to its goal significance, controllability, or alignment with norms and values). Thereby, the emotional experience takes a more specific shape and transforms from a general positive or negative affective state to a particular emotion (Ellsworth & Scherer, 2003). These processes are generally viewed as occurring automatically and unconsciously. Although the underlying evaluations that led to an emotional state can become conscious to a person, the awareness of them is not a prerequisite for emotions to occur (Ellsworth & Scherer, 2003; Wirth & Schramm, 2005).

Another issue is the question how the diversity of different emotional states can be organized and classified. One fundamental difference between emotion theories relates to the question whether they consider emotions as dimensional or discrete (although many also reconcile both views, e.g. Lange & Zickfeld, 2021; Seungjo Lee & Lang, 2009; Plutchik, 1980).

Dimensional views of emotion suggest that emotions can best be described along a number of underlying dimensions, most commonly valence or pleasantness, arousal or activation (e.g., Bradley & Lang, 1994; Posner et al., 2005; Russell & Barrett, 1999). Discrete perspectives view emotions as distinct categories with unique patterns of subjective experience, physiological activation (autonomic specificity), and behavior (Izard, 1992; Lazarus, 1991). Happiness/joy, sadness, anger, and fear/anxiety are the emotions that are most often considered as "basic" (Wirth & Schramm, 2005), that is, emotions that are rooted in evolution, which are elicited by specific event patterns (e.g., happiness as a result of goal-relevant achievements, anxiety as a result of goal conflicts; Oatley & Johnson-Laird, 1987). These are also the emotions that people experience most often in their daily lives (Oatley & Duncan, 1994). Some theorists consider a certain set of emotions as basic, and explain other, complex emotions as a combination of basic emotions (e.g., Oatley & Johnson-Laird, 1987).

Appraisal theories form the basis of empirical research and theoretical models for understanding effects and the emergence of emotions in the context of media use (e.g., Bartsch et al., 2008; Nabi, 1999, 2003, 2015; Schramm & Wirth, 2010; Wirth & Schramm, 2007) and are also foundational for understanding how emotions are elicited by narratives (e.g., Tan, 1995). In the next section, I will explain how narratives can create emotional experiences.

4.2 Emotions in Response to Narratives

There is no doubt that narratives are eminently suited to create emotional experiences in their audiences. The emotions elicited by narratives (fictional or not) have the same basic qualities as the emotions in response to real-life events, and research has shown that people experience a similar range of emotions through narratives as in their everyday lives (Mar et al., 2011). Because narrative events do not have real-life consequences for audiences, narrative emotions differ from emotions in response to real events in some respect. Often they are less enduring and intense, and the action tendencies associated with them may also differ. For

example, sadness over the loss of a loved character is likely to dissipate faster than if one were to grieve the death of a friend. A depiction of a dangerous threat in a narrative is unlikely to generate the same flight or fight response if the threat were real (Mar et al., 2011; Nabi & Green, 2015; Oatley, 1995).

Structural features of the narrative (how a story is told), the events within the story and how they affect the characters, and the audience's affiliations with the characters all play a role for the emotions elicited by narratives. On a fundamental level, emotions in response to a story can be distinguished as narrative emotions and aesthetic emotions (Mar et al., 2011; Oatley, 1995; see also Tan, 1996, who distinguishes between fictional and artifact emotions). *Narrative emotions* are elicited by events in the story (e.g., sadness in response to the death of a character). *Aesthetic emotions* result from perceptions of the narrative as a cultural artifact and evaluations of its aesthetic properties (e.g., appreciation of the cinematography or the author's writing style; Oatley, 1995; Tan, 1996). These aesthetic emotions can interact with narrative emotions and create particularly impactful experiences (Miall & Kuiken, 2002). Furthermore, the events in a narrative can prompt "fresh emotions" in their audiences as well as emotional memories (Mar et al., 2011). While fresh emotions are overall the most frequently occurring emotions in response to narratives, emotional memories are more likely to occur if audience members take on the perspective of an onlooker to a scene (rather than seeing things from the character's point of view; Cupchik et al., 1998).

Characters arguably play a key role within stories. As audience members engage with a story, they can experience narrative emotions as a result of identification with those characters (Oatley, 1995, 1999). *Identification* can be understood as a process in which an audience member "takes on the protagonist's goals and plans" (Oatley, 1999, p. 445; see also Cohen, 2001). As the story progresses, they experience emotions depending on what the events in the story mean for these goals. Identification entails cognitive and affective perspective taking, as well as empathy with the protagonist, that is, understanding what they think, believe, and feel,

and the ability to share these feelings (Appel et al., 2021; Healey & Grossman, 2018). Research finds that presenting a character in a positive light tends to facilitate identification (Cohen & Tal-Or, 2017; Hoeken & Sinkeldam, 2014; Tal-Or & Cohen, 2010).

Besides identification, emotions can arise out of *sympathy* with a character, in a sense of feeling for the character as a witness of events happening to them. This, too, requires an understanding of the protagonist's beliefs, goals, and how events in the narrative relate to these goals, but it does not imply feeling the same way as the protagonist (Oatley, 1995; Tan, 1995). Negative events are particularly apt to induce emotional responses through sympathy, even early on in a narrative, when audiences have not yet come to know a character very well: Royzman and Rozin's research (2006) has shown that while symhedonia (i.e., feeling happy for someone else) depends on prior attachment with the person, people tend to sympathize with someone facing adversity more easily, even if they are a stranger.

Affective dispositions towards characters are an important predictor for whether audience members wish for a character to succeed. *Affective disposition theory* (ADT; Raney, 2004, 2006; Zillmann & Cantor, 1977) holds that audiences morally evaluate the behavior of characters. As a result, they form positive dispositions toward characters they perceive as morally good (i.e., the protagonist), and negative dispositions towards characters they perceive as morally bad (i.e., the antagonist). Audiences wish for good outcomes for liked characters, and bad outcomes for disliked characters. As audience members follow the story, they will experience emotions as a result of the struggles and challenges faced by characters they have positive dispositions towards (e.g., anger as a liked character is experiencing injustice; pity for their suffering), as well as anticipatory emotions and suspense (e.g., hoping for the protagonist to reach their goal, and fearing for something bad happening to them; Raney, 2011). Recent research has reconsidered the role of moral evaluations in the process of disposition formation towards characters, given the popularity of some stories with anti-heroes or morally ambiguous characters at their center (Janicke & Raney, 2015, 2018; Shafer & Raney, 2012). However, the

basic principles of the theory still are useful for predicting audiences' dynamic emotional experiences as a function of their dispositions towards characters and the plights experienced by them.

Furthermore, narrative structures and the audiences' expectations related to them play a role in eliciting emotional responses. Story schemas about the event structure of stories and genre knowledge guide expectations about the narrative course of events and emotions associated with them, and the extent to which these expectations are met affects how a narrative is experienced (Dixon & Bortolussi, 2009; Grodal, 1999; Raney, 2004; Tan, 1995; Visch & Tan, 2008). Brewer and Lichtenstein's (1982) *structural affect theory* describes how different emotional responses to narratives can be elicited through the structural configuration of the narrative. Fundamental to this theory is the distinction between *event structure* (referring to the temporal order of events as they happened within the narrative world), *discourse structure*, which refers to the way these events are organized in the narrative. Some narratives are told in chronological fashion (i.e., the discourse structure follows the event structure), but oftentimes authors use flashbacks, flash-forwards, omit certain events from the story, or foreshadow events in the future. Through the way authors present events within the discourse structure, they are able to evoke suspense (by presenting the outcome of a critical event with delay), surprise (by revealing the true cause of a critical event, which was previously obscured), and curiosity (by presenting the outcome before the events that led up to it). Studies show that a delayed outcome resolution indeed evokes more suspense than presenting the outcome directly after the inciting event (de Graaf & Hustinx, 2011), although suspense does not seem to depend on whether the outcome is unknown (Hoeken & Van Vliet, 2000). Brewer and Lichtenstein (1982) only consider discourse structures on a global level (the main plot), but the logic of these basic structural principles (delay, omission) could also be applied to smaller sequences of events within a narrative. At the same time, different side plots of a narrative could follow different

discourse structures and thus, for example, evoke both curiosity and surprise (Wirth & Schramm, 2005).

5 Narratives Shaping Beliefs, Attitudes, and Behaviors

Stories are not just a means of entertainment, but also shape attitudes, intentions, and behaviors (e.g., Appel & Richter, 2007; Bilandzic & Sukalla, 2019; Braddock & Price Dillard, 2016; Dill-Shackleford et al., 2016; Green & Brock, 2000; Hamby et al., 2017; Hinyard & Kreuter, 2007; Murphy et al., 2013). Attitudes are understood as evaluative responses to an attitude object or a preceding stimulus (Breckler, 1984), and theoretical models on the structure of attitudes typically differentiate between a cognitive and affective component (e.g., Fabrigar & Petty, 1999). Tripartite models also include a behavioral component (e.g., Breckler, 1984). The affective component refers to emotional responses (varying between pleasurable and unpleasurable) to the attitude object, whereas the cognitive component includes beliefs, thoughts, or knowledge structures that vary between favorable or unfavorable evaluations of the attitude object. The behavioral component is represented by actions or behavioral intentions in favor of or unfavorable to the attitude object (Breckler, 1984).

The potential of narratives to persuade has inspired many research efforts, especially in health communication. Much of this research has been concerned with the question whether narratives have persuasive advantages over non-narrative, more traditional persuasive messages (i.e., expository texts, statistical evidence, arguments). Several meta-analyses have synthesized this research: Earlier meta-analyses found a small persuasive advantage of statistical compared to narrative evidence (r = .10; Allen & Preiss, 1997). More recent meta-analyses differentiate between different types of outcomes. Analyses of studies in health communication show that persuasive advantages of narratives over non-narrative messages pertain to behavioral intentions (r = .10; Zebregs et al., 2015) and behaviors in particular (r = .06; F. Shen et al.,

2015), whereas statistical information had stronger effects on beliefs (r = .16) and attitudes (r = .11; Zebregs et al., 2015).

This research also suggests that it is useful to differentiate between affective- and cognitive-level outcomes when examining narrative effects (Zebregs et al., 2015). When considering these different components, the effects of narratives might especially pertain to affective components of attitudes, due to the emotional processes underlying narrative experience (Zebregs et al., 2015). Some studies support the claim that narratives have a stronger effect on affective attitudes than on cognitive attitudes. For example, Kopfman et al. (1998) found that a narrative about organ donation increased affective reactions (in terms of positive and negative emotions about organ donation), whereas statistical evidence had a stronger effect on cognitive reactions (in terms of positive and negative thoughts). Krakow et al. (2018) found that narrative ads elicited stronger behavioral intentions than argument-based ads, and that this effect was mediated by positive affective attitudes towards the brand.

5.1 Transportation as a Mechanism of Narrative Influence

In the past two decades, research has become increasingly interested in understanding the unique processes underlying the influence of narratives. Early attempts to substantiate persuasive effects of narratives theoretically have drawn on social cognitive learning theory (Bandura, 2004), but since then, several theoretical models have been developed to explain how narrative effects occur (e.g., Busselle & Bilandzic, 2008; Green & Brock, 2002; Moyer-Gusé, 2008; Slater & Rouner, 2002). The common ground of these theoretical developments is the notion that transportation into the story world (Green & Brock, 2002; or narrative engagement; Busselle & Bilandzic, 2008) constitutes a key mechanism of narrative effects, and that the unique capacity of narratives lies in their ability to engage their audiences emotionally. Transportation effects on persuasion are argued to work by reducing processes related to resistance against attitude change (e.g., counterarguing), by increasing emotional engagement,

and by creating connections with characters (Green & Brock, 2000; Moyer-Gusé & Nabi, 2010; Slater & Rouner, 2002).

Several studies have been conducted and demonstrated the central role of transportation for narrative influence. For example, a study by Murphy et al. (2011) found transportation to be the most important variable to predict changes in knowledge, attitudes, and behavior as a result of watching an entertaining television drama with a lymphoma storyline. Whereas some studies have examined transportation as a moderator of narrative influence (e.g., Appel & Richter, 2010; Isberner et al., 2019; Schreiner et al., 2018), some studies have also successfully manipulated transportation, and found transportation to be a mediator of persuasive effects (Appel et al., 2019; Gebbers et al., 2017; Isberner et al., 2019). Meta-analytic evidence confirms that transportation plays a crucial role for narrative persuasion (Tukachinsky & Tokunaga, 2013; van Laer et al., 2014), that narratives are more effective than non-narratives to reduce resistance against attitude change, and that narrative engagement is associated with reduced resistance (Ratcliff & Sun, 2020). Furthermore, the emotional component of narrative engagement has been found to be the strongest predictor of narrative effects (Busselle & Bilandzic, 2009; De Graaf et al., 2009), which points to the role of emotions in narrative persuasion.

5.2 Emotions and Narrative Effects

Several studies have investigated the effects of emotions in the context of narrative effects. Murphy et al. (2011) found negative and positive affect in response to a TV show to be associated with information seeking about a health-related issue in the narrative. Other studies have manipulated the emotional content of narrative stimuli to examine persuasive effects of stories. For example, investigating the effects of narratives with high vs. low emotionality on behavioral intentions regarding vaccination, Betsch et al. (2011) found stories with higher emotional content to elicit higher story-consistent intentions. Other studies in health

communication find narratives that emphasized emotion-related arguments to be more effective than instrumental arguments, with respect to behavioral intentions (Frisby, 2006), or message evaluation (Keer et al., 2013). Appel and Richter (2010) found that in a story about organ donation with high emotional content, higher transportation was associated with story-consistent attitudes, but not for a story with low emotional content.

Some studies have examined the role of emotion for narrative effects more specifically with regards to discrete emotions. For example, Bilandzic and Sukalla (2019) investigated the effects of a fictional dystopian film on pro-environmental behavioral intentions. Narrative engagement was manipulated using a distraction manipulation, and higher narrative engagement was found to predict higher levels of guilt, which in turn was associated with greater pro-environmental intentions. The effects of single discrete emotions have received a lot of attention especially in the domain of persuasive emotional appeals, particularly fear appeals (Boster & Mongeau, 1984; Tannenbaum et al., 2015), guilt appeals (Graton & Mailliez, 2019; O'Keefe, 2000), and humor (Walter et al., 2018). The evidence generated in this research tradition is not based uniquely on narratives (emotional appeals can be designed in a narrative or non-narrative way, and studies sometimes do not take the narrative qualities of stimuli into account). Even so, insights from this research highlight how specific emotions in response to media messages can have unique effects with regard to information processing and behavioral implications (see Nabi, 1999, 2002, 2003). Nabi (2002) provides an overview and discusses the unique implications of different discrete emotions with regard to persuasion in light of their adaptive functions. For example, happiness or joy is elicited by achievement or the sense of making progress towards one's goals, and is associated with more heuristic and quick information processing. On the other hand, sadness is evoked by a sense of loss or failure, and is associated with slower information processing, inward focus, and contemplation (see also Lazarus, 1991). Fear as a response to threat increases attention to the threatening situation and evokes the desire to avert harm (Nabi, 1999, 2002), and the effectiveness of fear appeals is well

supported in the literature (see Tannenbaum et al., 2015 for a meta-analysis). Whereas guilt as a self-conscious moral emotion can increase perceptions of social responsibility and motivate prosocial behavior (see Bilandzic & Sukalla, 2019; Haidt, 2003), appeals to guilt can also backfire and lead to reactance (O'Keefe, 2000).

Some studies have also considered the role of multiple emotions in persuasion (e.g., Bilandzic et al., 2017; Dillard & Nabi, 2006; Reis et al., 2019). However, in light of the fact that stories are not only able to elicit multiple emotions, but typically move their audiences through a series of different emotions, Nabi and Green (2015; see also Nabi, 2015, for a discussion of emotional appeals in health communication) have advanced the idea that the experience of these emotional ups and downs plays an important role for narrative engagement and effects.

6 The Experience of Emotional Shifts in Narratives

As described above, the emotion-eliciting potential of stories is inherent to their design. As recipients follow the journey of the protagonist and become swept up in the narrative world, they are likely to experience emotional ups and downs. Nabi and Green (2015) refer to these dynamic emotional experiences as *emotional shifts*. Emotional shifts can occur between negatively and positively valenced emotions (e.g., a shift from sadness to joy, or vice versa), and between different emotions of similar valence (e.g., shifts between anger and sadness, or between relief and joy). Emotional shifts can also be conceptualized as distinct changes within one specific emotion category (e.g., the ebb and flow of fear experienced during a horror movie). The evolution of emotional shifts experienced throughout a media message is termed *emotional flow*.

Nabi and Green (2015) suggest that these emotional shifts are influential at all stages of the narrative experience. During *message selection*, emotional shifts play a role in attracting people to emotional content and therefore, help to secure attention to a narrative. The desire for

emotional shifts may motivate selection of narratives for mood regulation (Knobloch-Westerwick, 2006; Zillmann, 1988), or for emotional coping needs (Nabi et al., 2006; Nabi & Green, 2015). During *narrative processing*, emotional shifts like those occurring during suspense and because of excitation transfer (Zillmann, 1983, 1996), are proposed to contribute to processes like transportation and character identification. Furthermore, emotional shifts are argued to help to maintain attention towards the narrative and affect the distribution of cognitive resources towards the encoding of information related to emotional shifts (Nabi & Green, 2015). Thereby, emotional shifts may contribute towards the impact of narratives on story-related attitudes both directly, by fostering cognitive engagement with a message, and indirectly, by enhancing processes known to be mechanisms of narrative effects (e.g., transportation). Finally, the influence of emotional shifts is argued to extend beyond narrative exposure, by fostering various *post-narrative engagement* behaviors. Specifically, Nabi and Green (2015) suggest that emotional shifts may contribute to continued engagement with the story (e.g., continuing to watch a series, or rewatching a movie, but also thinking about a story and its characters), to information seeking, and message elaboration of the story's topic. Experiences characterized by emotional shifts might further generate conversations about a story and improve memory of the narrative events.

The studies presented in this thesis specifically focus on the role of emotional shifts during narrative processing and examine the relationship between emotional shifts and transportation. Manuscript #2 examines the relationship of emotional shifts with story-consistent attitudes and behavior, as well as social sharing intentions. In the following sections, I will describe how emotional shifts and transportation may drive one another during narrative processing, and how emotional shifts are proposed to contribute towards narrative effects on attitudes, behavior, and social sharing.

6.1 The Role of Emotional Shifts During Narrative Processing

6.1.1 Effects of Emotional Shifts on Transportation and Message Processing

To explain how emotional shifts may foster story and character engagement, Nabi and Green (2015) draw on research on the *suspense* literature. Suspense is strongly related to transportation (Bálint et al., 2017) and is elicited when a critical incident in the story suggests a serious outcome for a liked character, yet the resolution of this event is presented with delay (Brewer & Lichtenstein, 1982). As the story progresses, affective dispositions towards characters may cause audiences to shift between emotions such as fear and hope, depending on whether they anticipate a positive or negative outcome for the character, until suspense is resolved (Zillmann, 1996, 2006). Some empirical evidence within the suspense literature indirectly supports the assumption that emotional shifts foster transportation and persuasive effects, although none of these studies used a measure of emotional shifts. De Graaf and Hustinx (2011) found that a story with a suspense structure, in which the outcome of a critical event was presented at the end, elicited higher transportation and story-consistent beliefs than a story in which the outcome was presented right after the critical event. Using functional magnetic resonance imaging, Bezdek et al. (2015) showed that during moments in which suspense increased in film sequences, visual processing of peripheral cues decreased, whereas visual processing of central cues increased, suggesting that suspenseful scenes heighten attention. Similar evidence was found measuring attention via reaction times using a secondary task paradigm (Bezdek & Gerrig, 2017).

Furthermore, the experience of narrative emotions and transportation may be amplified via the principle of *excitation transfer* (Zillmann, 1983, 1996). Excitation transfer theory rests on the observation that physiological arousal, once induced, takes time to decay and return to its baseline level (Zillmann, 1996). Therefore, physiological arousal elicited through emotional stimuli (such as narrative events) may combine with arousal elicited by subsequent emotional stimuli. Excitation transfer may thereby heighten the experience of emotional shifts, not only

the joy or relief when suspense is (positively) resolved at the end, but also throughout a narrative's microstructure of suspenseful events (e.g., Bente et al., 2022).

Incidents in the narrative that are accompanied by emotional shifts may also trigger *orienting responses* (Nabi & Green, 2015). Orienting responses are embodied cognitive responses that occur to novel stimuli in the environment, or to information with signal properties. They lead to a temporary automatic increase of cognitive resource allocation to the encoding of information (Bradley, 2009; Lang, 2017). During a narrative, orienting responses may be elicited by formal or content features such as cuts, changes of scenery, emotionally evocative imagery, emotional words, or sound effects (Lang, 2017; Sungkyoung Lee & Potter, 2020; Potter et al., 2018). Sukalla, Shoenberger, and colleagues (2016) argue that orienting responses may be a process contributing to the continuous updating of the mental model of the story world and events (see Busselle & Bilandzic, 2008). In their study, Sukalla, Shoenberger, et al. (2016) found that orienting responses were triggered by surprising events in audiovisual narratives, and that the occurrence of orienting responses was not dependent on viewers' prior levels of narrative engagement. Therefore, orienting responses associated with features that elicit emotional shifts may enhance transportation and contribute to message engagement by redirecting attention to the narrative and increasing the processing of information, particularly in combination with heightened arousal generated by excitation transfer (Lang, 2017; Nabi & Green, 2015).

Lastly, the *limited capacity model of motivated mediated message processing* (LC4MP; Lang, 2000) can be applied to argue how emotional shifts might contribute towards message processing. This model rests on the assumption that there are limited cognitive resources available for the processing of media messages. Content and structural features of the message as well as a person's goals influence how these limited resources are allocated to cognitive processes (encoding, storage, and retrieval) during media use (Lang, 2006). Evidence suggests that emotional experiences are associated with motivational system activation. Whereas

negative emotional experiences – with the exception of anger – are associated with aversive system activation (supporting avoidance behaviors), positive experiences are generally related to appetitive system activation (Seungjo Lee & Lang, 2009). Studies have found that these motivational systems and particularly sequential- or co-activation patterns have different implications for the allocation of cognitive resources towards encoding and storage of information (e.g., Keene & Lang, 2016; Lang et al., 2013). Lang et al. (2013) found that for positively valenced audiovisual stimuli, cognitive resource allocation for encoding increased over time, whereas negatively valenced messages increased encoding in the beginning and storage towards the end. An example using a narrative stimulus including a shift in the emotional trajectory is provided by Clayton et al. (2021). In this study, the authors showed that in response to a self-transcendent video, cognitive resource allocation towards the narrative increased after a turning point, in which the protagonist's fate shifted from negative to positive. Depending on the placement of attitude-relevant information within the narrative, emotional shifts might influence the likelihood with which people encode, store, and retrieve this information to form attitudes (Keene & Lang, 2016; Lang, 2006). LC4MP can be used to explain how design features, structural elements, and emotions elicited by media content can lead to persuasion (Breves & Schramm, 2019; Fisher et al., 2018). To the extent that narrative events that elicit emotional shifts increase the cognitive resources required for processing, less cognitive resources remain for counterarguing (Nabi & Green, 2015).

6.1.2 Effects of Transportation on Emotional Shifts

Frijda (2007) states that emotions are "elicited by events with meanings appraised as real, and their intensity corresponds to the degree to which this is the case" (p. 8). He emphasizes that this apparent reality does not hinge on whether these events are fictional or not, and that the experience of emotions in response to narrative fiction does not mean that people

confuse fiction for facts. Rather, Frijda points out that immersion, visual presence and imagination are important influences on emotional impact.

Thus, likelihood and the intensity of experiencing emotional shifts in response to the events in a narrative can also be expected to depend on the extent to which audiences are engaged with the narrative and its characters. Although Nabi and Green (2015) focus on the effects of emotional shifts on narrative processes and effects, this view of a bidirectional relationship between transportation and emotional shifts is consistent with their framework. Therefore, emotional shifts may also be considered a mediator of transportation effects on story-consistent persuasive outcomes. As described earlier (see Chapter 3), transportation has been described in terms of deictic shift theory (see Segal, 1995): To experience transportation, audiences need to perform a deictic shift such that the narrative world becomes the world of reference (Busselle & Bilandzic, 2008). Transportation requires forming mental models of the narrative world, the characters, their beliefs and intentions, and understanding what the events in the narrative mean for them. Comprehending a character's thoughts, beliefs, and feelings, that is, taking on their perspective, is a prerequisite for experiencing emotional engagement and feeling with or for the character (Busselle & Bilandzic, 2008). Similarly, Tan (1995) considers an understanding of the significance of the events for a character as the basis for experiencing sympathy.

Transportation may be especially important for emotional shifts to occur for written narrative. Oatley (1995) considers emotions as a result of sympathy, identification, and those rooted in memory to occur once the readers enter the story world. This requires active imagination of the story world. In films the visuals are already provided and make it easy to experience emotions as a witness to the events happening in a scene (Tan, 1995), without the audience having to actively imagine them. Furthermore, studies show that sounds and film music are important triggers of emotional responses, imagery, and attention (Baumgartner et al., 2006; Daly et al., 2014; Rodero, 2012; Rodero & Romero, 2022; Vitouch, 2001). By

contrast, in written narratives audiovisual cues are missing and forming mental imagery of the events requires more active cognitive effort on the side of the recipient (Oatley, 1995). Thus, for text-based narratives (as the ones used in Manuscript #2) in particular, readers' degree of attentional focus, narrative comprehension, and vivid imagery are likely prerequisites for the experience of emotional shifts. Manuscript #2 of this thesis explores this possibility by considering emotional shifts as a mediator of transportation effects on story-consistent outcomes.

6.2 Emotional Shifts and Social Sharing

Manuscript #2 investigates the idea that narrative experiences characterized by emotional shifts may stimulate social sharing behaviors, such as talking about the story and the topics it addressed with others, sharing content online (e.g., on social media), or engaging with it in other ways, such as liking or commenting on a post. Research shows that the experience of emotion, including as a result of media use, creates a strong urge to talk about and share these experiences with others (e.g., Berger, 2011; Dobele et al., 2007; Dunlop et al., 2010; Rimé, 2009). This may serve various functions for individuals, including emotion regulation, understanding and deriving meaning from their emotional experiences, the development of socially shared knowledge about emotion, and strengthening social bonds (see Rimé, 2009 for an overview). In line with this idea, Bartsch (2012) found that being able to talk about emotional experiences in response to narratives is one of the emotional gratifications audiences derive from watching films and TV and may contribute towards psychological wellbeing.

This possible effect of narratives that stimulate emotional shifts is relevant to persuasion and attitude formation in several ways. The effect of emotional shifts on social sharing behavior not only helps to extend narrative influence to one's social network, but also serves an important function for message elaboration. The relevance of interpersonal communication for persuasion and attitude formation has been highlighted by research on the two-step-flow of communication

(Katz & Lazarsfeld, 1955; Southwell & Yzer, 2007). Furthermore, the act of creating and sharing messages on social media, or engaging in conversations about issues has cognitive, affective, and behavioral effects on the senders themselves, including effects on attitude formation ("self-effects"; Valkenburg, 2017).

An extensive body of research shows that people talk about media content and that this contributes to persuasive effects (e.g., Dunlop, 2011; Frank et al., 2012; Hwang, 2012; van den Putte et al., 2011). Research has also shown that emotions play an important role for the spreading of information on social media. For example, Stieglitz and Dang-Xuan (2013) found that emotionally charged tweets spread faster and were more likely to be shared than emotionally neutral tweets. Berger and Milkman (2012) suggest that the degree to which content evokes arousal may explain its diffusion in social networks. Using sentiment analysis, the authors found that online content that suggested high-arousing emotions such as awe or anger is more likely to "go viral" than low-arousing content.

Messages eliciting emotional shifts might be particularly capable to amplify emotional experiences as a result of excitation transfer, which in turn may stimulate conversations and contribute to the social sharing of content that elicited these experiences. The social sharing of emotional experiences might thereby fulfill important psychological needs of individuals, contribute to message elaboration, and spread persuasive influence through social networks both online and offline.

Manuscript #2 examines the idea that the number and intensity of emotional shifts experienced throughout a journalistic reportage may increase readers' social sharing intentions. Drawing from research on the social sharing of emotions and information diffusion in social networks, it seems plausible to assume that the extent to which readers experience emotional shifts throughout a narrative fosters social sharing intentions, however, research testing this assumption is lacking.

6.3 Measuring the Experience of Emotional Shifts as Narrative Processes

In order to study the role of emotional shifts as a process of narrative effects, researchers need to measure emotional experiences of participants during multiple points of a story (Nabi & Green, 2015). Ideally, emotional responses should be measured in the moment they occur, because this is the most likely to result in an unbiased account of the emotional experience (Mauss & Robinson, 2009).

In the following, I will give a brief and selective overview of possible methods that seem most suitable to measuring emotional processes during narratives, two of which I have used within my own research (Manuscript #1 and #2).

6.3.1 Psychophysiological Measures

Psychophysiological measures capture electrical signals on the surface of the skin that result from autonomic nervous system (ANS) activation (Potter & Bolls, 2012). The autonomic nervous system is divided into a sympathetic and a parasympathetic branch and regulates a wide variety of involuntary bodily functions, including (but not exclusive to) emotional responses and attentional processes (Mauss & Robinson, 2009; Potter & Bolls, 2012). Broadly speaking, the sympathetic branch is associated with activation, whereas the parasympathetic branch is associated with relaxation. Due to the nature of the ANS, physiological measures can be used to represent emotional responses rather broadly, in terms of arousal or positive and negative valence (Mauss & Robinson, 2009; Ravaja, 2004). Particularly in the context of complex emotional stimuli such as narratives, they are not suitable to infer more specific emotional experiences, such as sadness or joy (Behnke et al., 2022; Kreibig, 2010; J. T. Larsen et al., 2008).

The most commonly used indicator for arousal is skin conductance as a measure of electrodermal activity (EDA). Skin conductance is considered a reliable indicator of sympathetic nervous system activation, which affects the activity of the sweat glands and results

in “psychological sweating” (Potter & Bolls, 2012, p. 113). Skin conductance can be measured in terms of skin conductance level (SCL) and skin conductance responses (SCR). SCL refers to overall sympathetic activity over longer periods of time and changes only slowly. SCL is affected by skin conductance responses (SCR), quick changes in arousal that last only for short periods of time, which are evoked by occurrences that are “new, unexpected, relevant and/or or aversive” (Leiner et al., 2012, p. 239). However, skin conductance is not indicative of valence (Codispoti et al., 2008), and thus is best combined with other measures to gain a fuller picture of emotional responses (e.g., facial EMG). Furthermore, skin conductance is not indicative of emotional responding alone – for example, it is also used as a measure for habituation or cognitive challenge (Fahr & Hofer, 2013; Potter & Bolls, 2012). Therefore, in order to draw valid inferences skin conductance indicators need to be interpreted strictly within the scope of their experimental context and the used materials (Ravaja, 2004).

Facial electromyography (fEMG) has been used to measure positive and negative valence in response to media stimuli (J. T. Larsen et al., 2008). Using facial EMG, electrodes are placed on the skin over the site of specific facial muscles to record the electrical signal associated with their activation. Activation of the zygomaticus major (a muscle that is responsible for pulling up the corners of the mouth) is considered as an indicator for positive valence and responds to pleasant stimuli. Corrugator supercilii activation (a muscle above the inner corners of the eyebrows that is involved in frowning) is considered to be indicative of negative valence in response to unpleasant stimuli (J. T. Larsen et al., 2003).

If used correctly, both EDA and fEMG are considered valid and reliable measures of the arousal and valence dimensions of emotional responses (Mauss & Robinson, 2009; Potter & Bolls, 2012). Because autonomic nervous system activation occurs involuntarily, they are able to capture signals of psychological responding that participants are not aware of (Mauss & Robinson, 2009). However, they come with a number of challenges and limitations. One pertains to the highly artificial setting they create. To conduct psychophysiological studies,

participants are connected to various electrodes and cables, and in the case of fEMG, this makes for a particularly intrusive scenario. To record fEMG, electrodes connected to cables are placed on a person's face, close to the eye, and cables are at risk of impairing their vision and causing distraction (Cacioppo et al., 2000; Lewinski et al., 2014; Potter & Bolls, 2012). This might be especially problematic for experiencing transportation. Participants further need to be instructed to sit still, as SCL is prone to movement artifacts. Overall this can be an unsettling and for some participants even disturbing experience (Potter & Bolls, 2012; Tassinary & Cacioppo, 2007).

Furthermore, psychophysiological methods require specialized lab setups and extensive training in order to acquire usable data. Facial EMG in particular is sensitive to noise from the activity of other facial muscles, which are often in direct proximity to each other. Because the amplitude of the fEMG is very small, the noise from adjacent muscles as a result of placing the electrodes incorrectly can overpower the signal of the target muscle, making the data unusable (Fridlund & Cacioppo, 1986; Potter & Bolls, 2012).

6.3.2 Facial Expression Analysis

Emotions have a behavioral component and some emotion psychologists have suggested that emotional states lead to prototypical and observable emotional expressions (e.g., Ekman, 1993). The most prominent and widely used method that has been used in this context is the Facial Action Coding System (FACS; Cohn & Ekman, 2005; Ekman & Friesen, 1978). This system identifies basic emotions based on the activation of different facial muscles (e.g., raising of the upper lip, wrinkling of the nose). Different software applications have been developed using FACS (e.g., FaceReader), which are able to perform automated analyses of facial expressions based on video recordings of participants. There is some evidence in favor of the validity of such emotion recognition software, based on its ability to correctly recognize the emotions depicted in standardized stimulus sets of emotional expressions (Lewinski, 2015a; Lewinski et al., 2014). Automated facial expression analysis has found some application to infer

emotional states in research studying media effects (e.g., Lewinski, 2015b; Teixeira et al., 2012; Weth et al., 2015; Yu & Ko, 2017), including narrative persuasion (Appel et al., 2019).

However, while the evidence generally supports the idea that valence can be reliably detected from facial behavior (e.g., using fEMG; Mauss et al., 2005), the notion that facial displays can be used to infer discrete emotional states is more contested (Durán & Fernández-Dols, 2021; Mauss & Robinson, 2009; Reisenzein et al., 2013). A recent meta-analysis suggests that coherence between facial expressions and self-report of discrete emotions is rather small (Durán & Fernández-Dols, 2021), and some research using facial expression analysis software suggests that detection accuracy might be reduced for naturally occurring emotional expressions (Stöckli et al., 2018; Yu & Ko, 2017).

6.3.3 Self-Report Measures

Owed to their easy use and relatively straightforward interpretation, self-report measures are the most common way to measure emotion (Lang & Ewoldsen, 2011). They give insight into the subjective feeling component of emotional experience (Mauss & Robinson, 2009). A major pitfall related to the measurement of emotional shifts based on self-report in the context of narrative stimuli is how to do so without interfering with the narrative experience, as interruptions are going to affect transportation and possibly even cause adverse reactions (Kalch & Bilandzic, 2017; Wang & Calder, 2006, 2009).

The simplest option would be to ask participants about their emotional experiences after the narrative. This can be done by defining relevant events in the narrative and asking participants to rate the intensity of their emotional experiences during these points of the narrative, or by asking participants to plot graphs representing the intensity of various emotions experienced over the course of the narrative (e.g., Oceja & Carrera, 2009). However, such retrospective free recall measures are likely affected by memory biases. With increasing time passing between the emotional experience and its recall, the accuracy of such retrospective self-

reports tends to decline, causing people to rely on emotion concepts and generalized beliefs about emotion rather than felt experiences (Robinson & Clore, 2002a), although for retrospective self-reports directly after a stimulus, this may pose less of a problem (Walentynowicz et al., 2018). However, the interpretation of events earlier in the narrative may change in light of later developments of the story.

Thus, emotional shifts should preferably be measured in the moment they occur whenever possible. In the next section, I will describe two methods that I have used in the studies reported in this thesis to approach these problems.

6.3.3.1 Real-Time Response Measurement

The study reported in Manuscript #1 used real-time response measurement (RTR; also sometimes called continuous response measurement) to capture valence shifts during film viewing. RTR measures refer to procedures in which participants provide continuous ratings of an experience (e.g., liking, enjoyment, or emotional valence) while being exposed to a stimulus (Biocca et al., 1994). RTR measures can be administered using devices like handheld rating dials, sliders, or joysticks, or via touchscreens (tablets, smartphones) or web interfaces (Lottridge & Chignell, 2009; Ruef & Levenson, 2007; Wagner et al., 2021). Participants rate their responses to a stimulus by continuously adjusting the position of the slider (or similar device) on a bipolar dimension (e.g., valence). RTR measures are commonly used in user experience studies (e.g., Lottridge & Chignell, 2009, 2010), research on audience evaluations of political talk shows and televised debates (e.g., Maier et al., 2007, 2016), or research on music (e.g., Kock & Louven, 2018).

By enabling researchers to collect emotion data on a moment-to-moment basis, RTR measures avoid the memory biases associated with retrospective self-reports. Another advantage concerns the temporal resolution of RTR measures, which allows for a fine-grained assessment of emotional dynamics. Furthermore, the task of operating the slider to provide

continuous evaluations of a stimulus poses relatively little cognitive demand and is usually perceived as a manageable task by participants (Ruef & Levenson, 2007; Wagner et al., 2021). Importantly, research finds RTR measures to be non-reactive, meaning that they do not seem to alter the emotional experience itself (e.g., Hutcherson et al., 2005; Mauss et al., 2005; Wagner et al., 2021).

One limitation pertains to the fact that RTR measures only allow to assess emotional responses on a limited number of dimensions. The use of more than two dimensions is considered too overwhelming for participants (Biocca et al., 1994; Maier et al., 2007; Ruef & Levenson, 2007). Most studies using RTR measurement to measure emotional responses employ a single measure (most commonly, valence, Ruef & Levenson, 2007). Some studies measured emotional responses on two dimensions simultaneously, however, the use of two simultaneous RTR measures increases the cognitive demand of the task substantially (e.g., Lottridge & Chignell, 2010) and it is unclear whether this impairs emotional experiences and other relevant processes (e.g., transportation).

Measuring emotional shifts in terms of valence shifts implies that emotional shifts between discrete emotions with the same valence (e.g., anger and sadness) cannot be identified. At the same time, the use of one bipolar valence dimension (with a positive/pleasant and negative/unpleasant pole) poses difficulties for participants to provide responses in situations in which they experience complex emotions that are characterized by mixed affect (i.e., positive and negative at the same time). However, it is plausible to assume that the valence dimension is likely able to capture at least the core emotional shifts during typical stories, as positive and negative emotional events are an inherent feature of narrative structures (e.g., del Vecchio et al., 2021; Reagan et al., 2016).

6.3.3.2 Self-Probed Emotional Retrospections

In some cases, researchers may want to obtain a richer assessment of emotional experiences than is possible with real-time response measures. However, asking readers to generate detailed reports of their emotional experience during the narrative would disrupt narrative processes such as transportation and possibly alter the emotional experience itself by forcing an analytic reading mode (Larsen & Seilman, 1988).

A method that presents the option to obtain continuous emotion ratings for multiple emotion categories is the *self-probed emotional retrospection method* (Manuscript #2). The self-probed retrospection method was originally used by Larsen and Seilman (1988; Seilman & Larsen, 1989) as a method that combines concurrent thinking aloud and retrospective probing to study personal memories evoked by literature. In their study, readers were asked to read a text and signify occasions in which a personal memory occurred by putting a mark at the corresponding point in the text (Seilman & Larsen, 1989). After reading, readers were asked to describe their remindings, using these marks as probes. The method was later adapted by Eng (2002; see also Mar et al., 2011 for a discussion) to examine the role of emotions, memory, and distracting thoughts for reading comprehension of narrative and expository texts. During reading, participants marked occurrences of an emotion with an "E" and occurrences of a memory with an "M". After reading, participants returned to these markings to indicate the emotion they had felt at each point as well as its intensity. Koopman (2016) applied a similar procedure for a qualitative assessment of emotions and thoughts occurring in response to literary texts.

In Manuscript #2, this method was applied to quantify the number and intensity of emotional shifts in response to a fictional love story (Pilot and Experiment 1) and a journalistic reportage (Experiment 2). Participants were instructed to draw an "E" (for emotion) at the side margin of the text whenever they felt an emotional reaction while reading the story. Only after they finished reading, participants were asked to specify their emotional experience by rating

the intensity of six distinct emotions for each “E” (happiness/joy, sadness, anger, disgust, fear, and surprise). In contrast to RTR measurement, this method not only allows to tap into emotional shifts occurring within particular emotions, but also between a wider range of different emotions, and also is able to capture mixed emotional experiences. In addition, there are no predefined measurement points by the researcher. Often, emotions occur idiosyncratically (e.g., as a part of memories elicited by the story; Mar et al., 2011), meaning that they cannot be anticipated by interpreting the narrative events alone. For these reasons, this method seems particularly suited for “natural” stories and literary texts, which are often more complex and may elicit more idiosyncratic emotional responses than stories that have been created for experimental purposes and with very specific emotional shifts in mind. Even though this method was designed and best suited for text-based stimuli, it is conceivable to adapt it for the use with audiovisual or auditive narratives, for example by letting participants log time-stamps and revisit them after exposure.

The self-probed emotional retrospection method represents a type of cued-recall procedure. The “E”s participants mark down during reading function as cues that later enable the recall of their emotional experiences at a certain point in the narrative. Some studies provide evidence of the convergent validity of cued-recall procedures to measure emotion. For example, Mauss et al. (2005) demonstrate that continuous cued-recall ratings of amusement and sadness were strongly correlated with online-ratings of these emotions (measured with a rating dial) during film viewing. The cued-recall ratings were further coherent with physiological measures of arousal (particularly skin-conductance levels).

Thus, this method presents an unobtrusive, relatively economic (at least compared to physiological measurements) way to obtain a rich assessment of emotional experiences in the moment they occur.

6.4 Empirical Evidence and Open Questions

Some studies support the general idea that designing persuasive narratives to include a shift in emotional content positively affects persuasive outcomes (Carrera et al., 2008, 2010; Hamby & Brinberg, 2016; Rossiter et al., 1991; Rossiter & Thornton, 2004). Studies using health-related narratives that include a change of emotional valence from negative to positive (Carrera et al., 2010; Rossiter & Thornton, 2004), or positive to negative (Carrera et al., 2008) show that these narratives produce a greater persuasive effect than a negatively valenced story. Similarly, Hamby and Brinberg (2016) examined the effect of positive versus negative endings of cautionary tales (stories that narrate a threatening situation as a way of warning). Their studies show that a positive ending (thus, reflecting a shift from negative to positive) enhanced story-consistent beliefs by increasing message reflection.

However, it is unclear whether these effects can be explained by the experience of emotional shifts throughout a narrative, as these studies did not include a direct measure of emotional shifts (Carrera et al., 2008; 2010; Rossiter & Thornton, 2004), or only took into account the ending valence of the story (Hamby & Brinberg, 2016). This is also true for most of the studies that have emerged more recently, which investigate the propositions formulated in Nabi and Green's (2015) emotional shifts framework (e.g., Adams et al., 2022; Alam & So, 2020; Fitzgerald et al., 2020; Guido et al., 2018; Ophir et al., 2021; Ort et al., 2023; Sangalang et al., 2019; but cf. Clayton et al., 2021; Siegenthaler et al., 2021). Some did measure emotions during multiple points of exposure; however, these studies did not examine narratives and were less concerned with narrative engagement, but rather the persuasive effects of emotional shifts in emotional appeals (Lu & Yuan, 2022; Nabi et al., 2018; Shen & Li, 2023). Interrupting narrative experiences to probe emotions is not a viable strategy to measure emotional shifts for studies using narrative stimuli, as they interfere with transportation and lead to negative evaluations by audience members (see Kalch & Bilandzic, 2017).

Furthermore, research on the effects of emotional shifts is overwhelmingly conducted in the context of health communication, using emotional appeals that are specifically designed to persuade (Adams et al., 2022; Alam & So, 2020; Lu & Yuan, 2022; Ophir et al., 2021; Ort et al., 2023; Shen & Li, 2023; Siegenthaler et al., 2021). However, people engage with all kinds of narratives in their daily lives that are not primarily means of persuasion. Narratives are considered to serve an important function for making sense of the world (e.g., Bruner, 1990), and stories can shape real-life attitudes and behavior, even if they are not primarily created for a persuasive purpose (e.g., Appel, 2008; Appel et al., 2016; Bilandzic & Sukalla, 2019; Vezzali et al., 2015). For this reason, and to extend generalizability of findings beyond health communication, it is important to consider more naturalistic and complex stimuli (e.g., movies, journalistic narrative formats) to examine the role of emotional shifts as a narrative process.

Related to this argument, most studies examining effects of emotional shifts have used stimuli that included one singular shift (Alam & So, 2020; Clayton et al., 2021; Ophir et al., 2021; Sangalang et al., 2019; Siegenthaler et al., 2021). None have manipulated stories to reflect more complex narrative structures that are popular in Western storytelling (e.g., Boyd et al., 2020; Reagan et al., 2016) and that have been described by narrative theory since Aristotle (1994; Freytag, 1905; Vonnegut, 1981). Experiencing several shifts (rather than just one) that reflect the emotions implied by the narrative might result in different effects in terms of transportation.

With regard to persuasive outcomes, studies have focused on attitudes and beliefs (Alam & So, 2020; Ophir et al., 2021; Sangalang et al., 2019), and behavioral intentions (Alam & So, 2020; Clayton et al., 2021; Fitzgerald et al., 2020; Sangalang et al., 2019; Siegenthaler et al., 2021), but few have included a behavioral variable so far. Furthermore, the relationship of emotional shifts and transportation is underexplored, and the little evidence that exists is mixed (c.f., Alam & So, 2020; Ophir et al., 2021), which might be due to different operationalization strategies. What is more, to the best of my knowledge (with the exception of Appel et al., 2019),

no study has examined whether transportation might affect the experience of emotional shifts during narratives.

Thus, more research is needed to connect the experience of emotional shifts to narrative structures, further clarify the relationship between emotional shifts, transportation, their respective roles for story-consistent outcomes, and to help develop suitable measurement practices regarding emotional shifts.

7 Aims of the Current Research

The aim of this this thesis is to investigate the experience of emotional shifts in response to narratives and their interrelationship with transportation, as well as how these experiences affect story-consistent attitudes, behavior, and social sharing intentions. Further, I aimed to explore suitable measurement strategies to capture the subjective experience of emotional shifts in the moment they occur and without causing interference with the narrative experience, in ways that are suitable for different research contexts, and that facilitate generalizable statements regarding the relationship of emotional shifts. To this end, I report a series of studies and experiments in which I investigated these relationships across a range of different narratives, presentation modes, and using different measurement strategies for emotional shifts.

Manuscript #1 reports a laboratory study, in which I examined the link between real-time-response (RTR) valence shifts experienced during film viewing, transportation and a new post-exposure self-report measure of emotional flow. In this study, participants operated a handheld slider to continuously indicate the valence of their experience while watching two lengthy film excerpts. This study provided solid first evidence of a positive link between a continuous measure of experienced valence shifts throughout a narrative and transportation. Valence shifts were indexed using the mean intraindividual standard-deviation of RTR-valence. The RTR-valence data also served to validate a post-exposure self-report measure of the overall experience of emotional flow.

Manuscripts #2 expands on these correlational findings with a series of experiments that address the causal relationship between transportation and the experience of emotional shifts. Furthermore, Manuscript #2 extends the scope of Manuscript #1 by examining the role of emotional shifts in a narrative persuasion context, and by taking into account emotional shifts of discrete emotions.

Studies based on Nabi and Green's (2015; Nabi, 2015) framework have almost exclusively focused on the effects of emotional shifts on narrative effects, but have not considered how transportation might facilitate the experience of emotional shifts. Therefore, I examined the possible effects of transportation on emotional shifts by including a manipulation of transportation via positive or negative reviews presented prior to the story (see Tiede & Appel, 2020). Furthermore, much of the extant literature is focused on the effects of persuasive health messages. To increase the generalizability of findings, naturalistic stories were used as stimuli, in the form of a fictional love story (Pilot, Experiment 1) and a journalistic reportage (Experiment 2).

Experiment 1 examines how the experience of emotional shifts is associated with story-consistent attitudes. Experiment 2 takes up the idea that persuasive effects of narratives may be found with regards to behavioral intentions and affective level attitudes in particular (Zebregs et al., 2015). Therefore, I included measures for cognitive- and affective-level attitudes in this study, and a behavioral outcome measure in the form of donations for a story-related charity. I further included a measure for social sharing intentions to investigate whether the extent to which people experience emotional shifts during a narrative is linked to the desire to talk about and share narrative content.

In Manuscript #1, emotional shifts were measured in terms of valence shifts in response to a film. A pilot study and the main experiments in Manuscript #2 adapt and refine a *self-probed emotional retrospection task* to capture emotions in the moment they occur during reading. In contrast to RTR measures, this method also allows to examine shifts within and

between multiple discrete emotions. In Manuscript #2, emotional shifts were quantified in terms of their amount (the number of times the dominant emotion(s) changed between subsequent emotional experiences) and intensity (the sum of absolute difference scores between subsequent emotion ratings).

So far, research that has attempted to manipulate emotional shifts by altering story content has done so by including one singular shift (e.g., Alam & So, 2020; Ophir et al., 2021). To the best of my knowledge, no study has yet attempted to manipulate the experience of more than one shift using more complex narrative structures. In Manuscript #3, two experiments connect one of the most prototypical narrative arcs of Western storytelling (Boyd et al., 2020; Reagan et al., 2016; Vonnegut, 1981) to the experience of emotional shifts, emotional flow, and transportation. The short stories that were created for Experiment 1 and 2 differed only in their middle parts: the shifting version contained a negative event, the positive story represented a positive version of the same event. The beginning and ending of the story versions were identical. This resulted in a story that represented an emotional trajectory resembling a "man in a hole" structure (positive-negative-positive; Vonnegut, 1981; Reagan et al., 2016), and a predominantly positive story version. While manuscript #2 employed rather general measures of emotional shifts (the intensity and number of emotional shifts across all discrete emotions measured), Manuscript #3 looks at changes within specific emotions that were particularly relevant for the narratives used, i.e. happiness and sadness, and their effects on transportation and emotional flow.

In addition, a pilot study provides further evidence in favor of the construct validity of the post-exposure self-report measure of emotional flow (see Manuscript #1). Furthermore, it uses yet another presentation mode of narratives (auditive) and different sets of short stories in Experiment 1 and 2 to increase generalizability of the results across types and presentation modes of stories.

Table 1 provides an overview of the methodological information of all studies reported in the manuscripts. Manuscript #1 and #2 have been published in peer-reviewed journals relevant to the fields of media psychology and communication studies. Manuscript #3 has been under review at one journal, and will be submitted for publication again. The research reported in these manuscripts has further been presented at various international and national conferences. Results and implications of these manuscripts for research on emotional shifts will be discussed in Chapter 14.

Table 1.

Methodological Overview of Studies Reported in This Thesis.

Manuscript	Study	N	Stimuli	Conditions	Emotional Shift Measures	Further Measures
1	Main study	169 (lab)	Audiovisual: film excerpts (within subjects)	-	Real-time-response slider: valence shifts	Transportation (Appel et al., 2015) Emotional flow scale
2	Pilot	146 (lab)	Written: fictional short love story	Transportation: positive vs. negative vs. no review (pre-exposure attitudes)	Self-probed emotional retrospections: number of „E“ markings	Transportation (Appel et al., 2015) Need for affect (Appel et al., 2012) Story-related attitudes
	Exp. 1	128 (lab)		Transportation: positive vs. negative vs. no review	Self-probed emotional retrospections: number and intensity of emotional shifts	
	Exp. 2	139 (lab)	Written: journalistic reportage	Transportation: positive vs. negative vs. no review (comparison story)		Transportation (Appel et al., 2015) Cognitive- and affective-level attitudes Story-related behavior (donation) Social sharing intentions
3	Pilot	138 (online)	Audiovisual: fictional short films (emotional arcs: pos-neg & neg-pos)	-	Retrospective self-report (before and after narrative shift)	Emotional flow scale Appreciation, fun, suspense (Oliver & Bartsch, 2010)
	Exp. 1	113 (lab)	Auditive: fictional short story (robot)	Emotional arc of narratives: shift (pos-neg-pos) vs. positive only	Retrospective self-report (for three story parts): intensity of happiness- and sadness-shifts	Transportation (Appel et al., 2015) Emotional flow scale
	Exp. 2	103 (lab)	Auditive: fictional short story (career change)			

8 Manuscript 1: Real-Time Responses to Stories

Winkler, J. R., Mengelkamp, C., & Appel, M. (2022). Real-time responses to stories: linking valence shifts to post-exposure emotional flow and transportation. *Communication Research Reports*, *39*(5), 237–247. https://doi.org/10.1080/08824096.2022.2119380

Real-time Responses to Stories: Linking Valence Shifts to Post-Exposure Emotional Flow and Transportation

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Abstract

Narrative experiences are characterized by dynamic emotional responses. Research has begun to investigate implications of emotional shifts for narrative processing, but the continuous measurement of emotion poses a challenge. This study examines how valence shifts captured using real-time response (RTR) measurement during two films relate to transportation and post-exposure self-reported emotional flow. Across both films, valence shifts (in terms of the mean intra-individual standard deviation of RTR valence) were positively correlated with transportation and self-reported emotional flow. Valence shifts and self-reported emotional flow were higher among women than men. We discuss the use of RTR measurement for the assessment of emotional shifts during narrative processes.

Keywords: Emotional Shifts, Emotional Flow, Transportation, Real-Time Response

Real-time Responses to Stories: Linking Valence Shifts to Post-Exposure Emotional Flow and Transportation

Stories are characterized by narrative arcs that imply dynamic emotional experiences on the side of recipients (e.g., Appel et al., 2019). Nabi and Green (2015) refer to these experiences as *emotional shifts* and propose influences on media selection, narrative processes and related effects. A major challenge in the study of emotional shifts is the measurement of emotions during multiple points in the narrative. The present study utilizes real-time response (RTR) measurement to capture valence shifts experienced during stories and to investigate their association with transportation (Green & Brock, 2000) and a post-exposure self-report measure of *emotional flow* (Authors, under review). Furthermore, we examine valence shifts and emotional flow with respect to possible gender differences. In addition to traditional null hypothesis testing, we report Bayesian statistics.

Emotional Shifts and Narrative Transportation

Emotional shifts refer to the changes in emotional states recipients experience in response to media messages. Shifts may occur between different discrete emotions (e.g., happiness and sadness) or as variation in the intensity of a particular emotion (Nabi & Green, 2015). From a dimensional view of emotion (e.g., Russell, 1980), shifts can be understood in terms of variation along the dimensions of valence and arousal. This study focuses on valence shifts, which may manifest as changes from positive to negative (and vice versa), or as changes in the intensity of positive and negative valence. In the following, we will use the term valence shifts rather than emotional shifts, except when denoting emotional shifts between discrete emotions. We further use the term *emotional flow* to refer to the "evolution of the emotional experience ... marked by a series of emotional shifts" (Nabi & Green, 2015, p. 143).

Transportation is conceptualized as a process in which all mental systems of a person become focused on the narrative events and is characterized by heightened attention towards

the story, the building of rich imagery, and engaging in perspective taking with the protagonists (Green & Brock, 2000). Nabi and Green (2015) argue that emotional shifts sustain narrative processes like transportation. This assumption is backed by the information processing literature, which suggests benefits of sequential activation of the appetitive and aversive motivational systems for cognitive resource allocation to the encoding of messages (e.g., Clayton et al., 2021). Because appetitive system activation occurs in response to pleasant messages (implying induction of positive emotional valence) and aversive system activation in response to unpleasant messages (implying negative valence), valence shifts elicited by stories may direct attention to the narrative. Furthermore, research on suspense suggests that emotional shifts in response to suspenseful stories (i.e., experiencing suspense resolution after fearing for protagonists, Zillmann et al., 1975) may underlie transportation into suspenseful narratives (e.g., Bezdek & Gerrig, 2017). Some initial evidence for the link between shifts and transportation is provided by Alam and So (2020), who found that stories representing a valence shift induced higher transportation than single valence stories, although this result may have been affected by the difference in story length between groups. More recently, Author et al. (in press) examined the relationship between transportation and emotional shifts for written narratives and measured emotional shifts using self-probed emotional retrospections. Participants marked an “E” at the text margin whenever they experienced an emotion in response to the story. After they finished reading, participants were asked to specify their emotional experiences during these occurrences. For both a fictional short story and a non-fictional journalistic narrative, the authors found that transportation was positively related to the intensity and the number of emotional shifts participants experienced while reading. However, further studies are needed to examine the relationship between shifts and transportation across different narrative media, particularly studies relying on continuous measures of emotion.

Measuring Valence Shifts and Emotional Flow

Studying the role of valence shifts for narrative processing requires to measure valence at multiple points of the narrative. Psychophysiological measures (e.g., skin-conductance levels, facial electromyography), facial expression analyses, or measures of brain activity (e.g., neuroimaging) offer the possibility to capture the valence and arousal dimensions of emotion as they occur (Mauss & Robinson, 2009), but require costly equipment and extensive training regarding application, data analysis, and interpretation. By contrast, real-time response measures using rating dials or similar devices to capture subjective emotional responses are comparatively accessible (Ruef & Levenson, 2007). Importantly, this method poses relatively little cognitive demand and thus, avoids interference with other narrative processes (Wagner et al., 2021). By allowing individuals to indicate emotional responses in the moment they occur, memory biases observed with retrospective self-reports of emotion are avoided. Finally, shared methods to measure two constructs (e.g., two self-report scales) may systematically affect correlations between these variables (common method bias, Podsakoff et al., 2003). RTR measures of emotion help to avoid this problem in studies that are otherwise relying on self-report to measure narrative processes and effects.

Emotion data gathered using RTR measurement is open to several data analytic strategies, depending on a study's research questions (see Ruef & Levenson, 2007). To operationalize shifts, difference scores of average emotion ratings before and after a predefined point in the narrative may be computed (e.g., Siegenthaler et al., 2021). This approach is useful in experimental contexts, where stimuli are manipulated to elicit specific emotional responses. However, for studies using more complex narratives with a less clear-cut position of shifts, other approaches are more appropriate. In this study, we are interested in the overall extent of valence shifts throughout the narrative rather than the intensity of a specific shift. Therefore, we use the intra-individual standard deviation of participants'

valence data as a variability measure (see recommendations on analyzing affective dynamics from experience sampling data by Ebner-Priemer et al., 2009).

The use of an RTR measure not only allows to investigate the link between transportation and valence shifts, but also to further examine the construct validity of a self-report measure of emotional flow[1] (Authors, under review). This scale was created to measure the overall experience of emotional flow throughout a narrative and is applicable to all research contexts and stimuli regardless of presentation mode (audiovisual, auditive, written text) or the particular emotional arc represented by the narrative (see Supplement S4 for the items). Valence shifts as a type of emotional shift should contribute to the overall perception of emotional flow.

Taken together, we expected a positive association between valence shifts and transportation (Hypothesis 1a) and a positive association between self-reported emotional flow and transportation (1b). We further expected a positive relationship between valence shifts and self-reported emotional flow (Hypothesis 2).

A secondary focus of our study was to examine possible gender differences in our measures of valence shifts and self-reported emotional flow. Prior research shows gender differences regarding the general self-reported frequency and intensity of certain emotions (e.g., Simon & Nath, 2004) as well as emotional responses to audiovisual media stimuli (e.g., Maffei et al., 2015). Given that women responded more strongly to emotional stimuli in prior research, we expected women to score higher than men both in valence shifts (Hypothesis 3a) and self-reported emotional flow (3b).

[1] The order of Hypothesis 1 and 2 is reversed in the preregistration. Furthermore, our terminology slightly deviates from the preregistration. We now use the term *emotional flow* in reference to the construct underlying the self-report scale instead of *emotional shift*. The latter corresponded to the working title for the self-report scale at the time.

Methods

The preregistration of this article is available at https://aspredicted.org/5GN_7B8. This research was conducted in accordance with the Declaration of Helsinki and the ethical guidelines by the German Psychological Society (DGPs). Institutional approval is not required for psychological research in Germany, unless is relates to issues regulated by law. Informed consent was obtained from all participants before taking part in the study.

Sample and Design

The study followed a cross-sectional, non-experimental design. The sample size was determined a priori (see Supplement S1 for details). A total of 189 students of a German university participated for course credit. We excluded 18 participants due to technical malfunction of the RTR-slider, leading to missing values for one or both stimulus films. Another two participants were excluded due to insufficient language proficiency, leaving a final sample of 169 participants who were 22.59 years old on average (SD = 6.83) and predominantly female (n = 110).

Materials

Participants viewed excerpts from two films in randomized order. One excerpt was taken from *Head Full of Honey* (German: Honig im Kopf, Schweiger, 2014), a tragic comedy about a young girl and her grandfather, who suffers from dementia (clip duration 29:56 minutes). The second excerpt was taken from *My Sister's Keeper* (German: Beim Leben meiner Schwester, Cassavetes, 2009), a drama about a girl who serves as a savior sibling to cure her sister's leukemia (clip duration 33:38 minutes).

Measures

Valence Shifts

Emotional responses to the films were assessed using a continuous-response measure (1 Hz). Participants used a handheld device with a vertical slider to indicate emotional valence throughout the films on a continuum from positive (1023) to negative (0). A built-in linear

motor generated a resistance around the middle (480 to 522) to indicate the slider's neutral position (501). Participants were instructed to use their dominant hand for operating the slider (see Supplement S2 for the detailed instruction, and S6 for sample data). As an indicator of the extent to which participants experienced valence shifts, we used the intra-individual standard deviation (Ebner-Priemer et al., 2009). For this variable, higher values indicate stronger valence shifts.

Self-Reported Emotional Flow

We used nine items (Authors, under review) to assess viewers' overall subjective experience of emotional flow while watching the videos (e.g., "As I followed the story, I experienced a series of different emotions", see Supplement S4). The items were presented after each film and rated on 7-point rating scales ranging from 1 (not at all) to 7 (completely). Cronbach's α was .89 for *Honey in the Head* and .93 for *My Sister's Keeper*.

Transportation

We measured transportation using the Transportation Scale-Short Form (6 items, Appel et al., 2015) adapted to the context of audiovisual narratives (Gebbers et al., 2017; Appel & Mengelkamp, 2022, e.g., "While watching the film clip, I had a vivid mental image of the characters/the story setting"). Responses were measured on 7-point rating scales from 1 (not at all) to 7 (completely). Cronbach's α reached .79 for *Honey in the Head* and .82 for *My Sister's Keeper.* Please see Supplement S5 for additional measures.

Procedure

Participants entered the laboratory individually or in groups of up to four. After being instructed by a lab assistant, they first practiced operating the slider while watching a short film (3 minutes). Then they read a summary of the first film's background story (see Supplement S3) before watching the first film sequence, indicating their emotional responses as they occurred with the slider. Immediately after the film had ended, participants completed

the self-report questionnaire that included the emotional flow and transportation items. The same procedure was repeated for the second film excerpt.

Results

Bayes-factor analyses were calculated using JASP version 0.16.1.0. The default JASP priors are used, i.e., a uniform prior for correlational analyses (Wagenmakers et al., 2018), and a Cauchy distribution for t-tests (Rouder et al., 2012).

Our first hypothesis stated a positive relationship between valence shifts and transportation, and between self-reported emotional flow and transportation. For both films, we observed significant and moderate to strong positive correlations between valence shifts and transportation, and between emotional flow and transportation. Bayes-factor analyses show that the data for the correlation between transportation and valence shifts is 1.13 million times (My Sister's Keeper) or 123,000 times (Head Full of Honey) more likely under the H_1 compared to the H_0, providing strong evidence that both variables are positively associated. For the correlation between transportation and emotional flow BF_{10} are even higher (Table 1). Thus, Hypotheses 1a and 1b are supported.

Furthermore, valence shifts were positively and significantly associated with self-reported emotional flow for both films. Bayes-factor analyses show that the data is 379,000 times (My Sister's Keeper) or 2.47 million times (Head full of Honey) more likely under the H_1 compared to the H_0, providing support for Hypothesis 2 (Table 1 and Supplement S9).

[Table 1]

To test for gender differences as predicted by Hypothesis 3, we conducted t-tests (one-tailed). Results show that indeed, women consistently reported higher emotional flow and

stronger valence shifts than men across both films (Table 2).[2] This is true for frequentist and Bayesian analyses, which show that the data is at least 10.3 times more likely under the H_1 than the H_0. Thus, Hypothesis 3 is supported.

[Table 2]

Discussion

This study examined emotions as they occurred using RTR measurement to test associations between valence shifts and post-exposure self-report measures of transportation and emotional flow. Consistent with the postulations derived from Nabi and Green's (2015) framework, the magnitude of valence shifts (operationalized as intraindividual RTR-variance) was positively and substantially related to transportation and emotional flow. Using this type of measure increases trust in our findings because the correlations are less likely to be affected by common method bias (Podsakoff et al., 2003) and memory biases associated with retrospective self-reports of emotion.

The relationship between valence shifts and emotional flow provides some further evidence for the emotional flow self-report scale's construct validity. This scale was designed to capture the general experience of emotional flow, regardless of the type of narrative and the particular emotions involved. Because of the scale's versatility and ease of use it may prove useful for future research, particularly in contexts in which process measures of emotion are not viable. However, future studies are necessary to substantiate confidence in this scale's construct validity, measurement invariance, and discriminant validity.

Our results indicate substantial gender differences with regard to valence shifts, self-reported emotional flow, and transportation, such that women scored higher on these

[2] Although not preregistered, we also tested for gender differences in transportation. Results were significant for both *Honey in the Head* (women: $M = 5.62$, $SD = 0.94$, men: $M = 5.02$, $SD = 0.96$), $t(167) = 3.92$, $p < .001$, $d = 0.63$, and *My Sister's Keeper* (women: $M = 5.46$, $SD = 0.85$, men: $M = 4.78$, $SD = 1.22$), $t(88.55) = 3.82$, $p < .001$, $d = 0.68$.

measures across both films. This ties in with previous studies, which found that women respond stronger to emotionally charged stimuli (e.g., Maffei, 2015). Moreover, research suggests that gender differences in emotional expression are influenced by gender roles (Chaplin, 2015), and that women report some negative emotions like sadness more frequently than men (e.g., Simon & Nath, 2004). The films used in this study both focused on tragic relational stories, which women may have responded to more strongly due to the communal theme of the films and their tragic appeal. Whether gender differences are present in response to other narratives is a question for future research. Furthermore, the subsample sizes in our study were unequal, owed to the fact that the examination of gender differences was a secondary goal. Future research is encouraged to corroborate our findings with more balanced subgroups.

The priority of this study was the measurement of valence shifts and establishing a link to transportation to provide a starting point for future research on the role of dynamic emotional experiences for narrative processing. Because our design does not include an experimental manipulation of valence shifts, the results presented here are correlational. Manipulating the experience of shifts is challenging, because altering the content of stories to achieve different emotional arcs may introduce confounding variables. We encourage future studies to further investigate the causal relationship between emotional shifts and other narrative processes by manipulating the experience of emotional shifts.

Another challenge for future studies is to investigate the dynamic relationship between transportation and emotional shifts at the intra-individual level. Because we used a static post-exposure measure of transportation, this was not possible in this study. However, previous research suggests that transportation is not static, but fluctuates throughout a narrative (e.g., Bezdek & Gerrig, 2017). To understand how emotional shifts foster transportation in the moment they occur (and in turn, if transportation enhances the experience of emotional shifts), future research should consider process measures of both experiences.

One limitation associated with RTR measures of emotion is that they are typically confined to one dimension (e.g., valence, Ruef & Levenson, 2007). Operating two sliders simultaneously increases the cognitive demand of the task (Lottridge & Chignell, 2010), which may interfere with other narrative processes. Thus, RTR measures are less suitable to capture shifts between discrete emotions. Furthermore, whenever participants experience positively and negatively valenced emotions simultaneously, they may have difficulty indicating their experience on one valence scale. Second, RTR measures are best suitable for auditive and audiovisual stimuli. For written narratives, other continuous measures of emotion are more appropriate, such as self-probed emotional retrospections, which are also suited to study subjectively experienced shifts between discrete emotions (Authors, in press).

Conclusion

Based on emotional shifts theory (Nabi & Green, 2015), we examined real-time valence shifts during two lengthy film excerpts. As expected, the magnitude of valence shifts (operationalized as intra-individual RTR-standard deviation) was associated with transportation and overall self-reported emotional flow. The method and results presented inform narrative theory and provide an inspiration to future research on the dynamic processing of stories.

Supplemental Material

The data, code, and supplemental material for this article are available at https://osf.io/8xuth/?view_only=2c01ea29577e445e99dfe9015ab5d6f0.

References

Alam, N., & So, J. (2020). Contributions of emotional flow in narrative persuasion: An empirical test of the emotional flow framework. *Communication Quarterly, 68*(2), 161–182. https://doi.org/10.1080/01463373.2020.1725079

Appel, M., Gnambs, T., Richter, T., & Green, M. C. (2015). The transportation scale–short form (TS–SF). *Media Psychology, 18*(2), 243-266. https://doi.org/10.1080/15213269.2014.987400

Appel, M., Schreiner, C., Haffmans, M.-B., & Richter, T. (2019). The mediating role of event-congruent emotions in narrative persuasion. *Poetics*, *77*, 101385. https://doi.org/10.1016/j.poetic.2019.101385

Appel, M., & Mengelkamp, C. (2022). Watching videos on a smartphone: Do small screens impair narrative transportation? *Media Psychology.* Advance online publication. https://doi.org/10.1080/15213269.2021.2025109

Bezdek, M. A., & Gerrig, R. J. (2017). When narrative transportation narrows attention: Changes in attentional focus during suspenseful film viewing. *Media Psychology, 20*(1), 60–89. https://doi.org/10.1080/15213269.2015.1121830

Cassavetes, N. (2009). *My sister's keeper* [Film]. Curmudgeon Films.

Chaplin, T. M. (2015). Gender and emotion expression: A developmental contextual perspective. *Emotion Review, 7*(1), 14–21. https://doi.org/10.1177/1754073914544408

Clayton, R. B., Raney, A. A., Oliver, M. B., Neumann, D., Janicke-Bowles, S. H., & Dale, K. R. (2021). Feeling transcendent? Measuring psychophysiological responses to self-transcendent media content. *Media Psychology, 24*(3), 359–384. https://doi.org/10.1080/15213269.2019.1700135

Ebner-Priemer, U. W., Eid, M., Kleindienst, N., Stabenow, S., & Trull, T. J. (2009). Analytic strategies for understanding affective (in)stability and other dynamic processes in

psychopathology. *Journal of Abnormal Psychology, 118*(1), 195-202. https://doi.org/10.1037/a0014868

Gabert-Quillen, C. A., Bartolini, E. E., Abravanel, B. T., & Sanislow, C. A. (2015). Ratings for emotion film clips. *Behavior Research Methods*, *47*(3), 773–787. https://doi.org/10.3758/s13428-014-0500-0

Gebbers, T., De Wit, J. B. F., & Appel, M. (2017). Health communication - transportation into narrative worlds and the motivation to change health-related behavior. *International Journal of Communication, 11*, 4886-4906. Retrieved from http://ijoc.org/index.php/ijoc/article/view/6977

Green, M. C., & Brock, T. C. (2000). The role of transportation in the persuasiveness of public narratives. *Journal of Personality and Social Psychology, 79*(5), 701–721. https://doi.org/10.1037//0022-3514.79.5.701

Lottridge, D., & Chignell, M. (2010). Sliders rate valence but not arousal: Psychometrics of self-reported emotion assessment. *Proceedings of the Human Factors and Ergonomics Society, 54*(20), 1766–1770. https://doi.org/10.1518/107118110X12829370090720

Maffei, A., Vencato, V., & Angrilli, A. (2015). Sex differences in emotional evaluation of film clips: Interaction with five high arousal emotional categories. *PLoS ONE*, *10*(12), 1–13. https://doi.org/10.1371/journal.pone.0145562

Mauss, I. B., & Robinson, M. D. (2009). Measures of emotion: A review. *Cognition & Emotion, 23*(2), 209–237. https://doi.org/10.1080/02699930802204677

Nabi, R. L., & Green, M. C. (2015). The role of a narrative's emotional flow in promoting persuasive outcomes. *Media Psychology, 18*(2), 137–162. https://doi.org/10.1080/15213269.2014.912585

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended

remedies. *Journal of Applied Psychology, 88*(5), 879–903. https://doi.org/10.1037/0021-9010.88.5.879

Rouder, J. N., Morey, R. D., Speckman, P. L., & Province, J. M. (2012). Default Bayes factors for ANOVA designs. *Journal of Mathematical Psychology, 56*(5), 356-374. https://doi.org/10.1016/j.jmp.2012.08.001

Ruef, A. M., & Levenson, R. W. (2007). Continuous measurement of emotion: The affect rating dial. In J. A. Coan & J. J. B. Allen (Eds.), *The handbook of emotion elicitation and assessment* (pp. 286–297). Oxford University Press.

Russell, J. A. (1980). A circumplex model of affect. *Journal of Personality and Social Psychology, 39*(6), 1161–1178. https://doi.org/10.1037/h0077714

Schweiger, T. (2014). *Honig im Kopf* [Head full of honey] [Film]. Barefoot Films.

Siegenthaler, P., Ort, A., & Fahr, A. (2021). The influence of valence shifts in fear appeals on message processing and behavioral intentions: A moderated mediation model. *PLOS ONE, 16*(9), Article e0255113. https://doi.org/10.1371/journal.pone.0255113

Simon, R. W., & Nath, L. E. (2004). Gender and emotion in the United States: Do men and women differ in self-reports of feelings and expressive behavior? *American Journal of Sociology, 109*(5), 1137–1176. https://doi.org/10.1086/382111

Wagenmakers, E.-J., Love, J., Marsman, M., Jamil, T., Ly, A., Verhagen, J., . . . Morey, R. D. (2018). Bayesian inference for psychology. Part II: Example applications with JASP. *Psychonomic Bulletin & Review, 25*, 58-76. https://doi.org/10.3758/s13423-017-1323-7

Wagner, V., Scharinger, M., Knoop, C. A., & Menninghaus, W. (2021). Effects of continuous self-reporting on aesthetic evaluation and emotional responses. *Poetics, 85*, 101497. https://doi.org/10.1016/j.poetic.2020.101497

Zillmann, D., Hay, T. A., & Bryant, J. (1975). The effect of suspense and its resolution on the appreciation of dramatic presentations. *Journal of Research in Personality, 9*(4), 307–323. https://doi.org/10.1016/0092-6566(75)90005-7

Tables

Table 1

Means, Standard Deviations, and Zero-Order Correlations (p-Values, BF_{10} in Brackets)

	Head Full of Honey		My Sister's Keeper				
	M	*SD*	*M*	*SD*	1	2	3
1. Valence shifts (RTR)	220.54	75.85	217.26	77.77	-	.432 (< .001, $2.47 \cdot 10^6$)	.396 (< .001, $1.23 \cdot 10^5$)
2. Emotional flow	5.52	1.02	5.06	1.22	.410 (< .001, $3.79 \cdot 10^5$)	-	.588 (< .001, $1.17 \cdot 10^{14}$)
3. Transportation	5.41	0.98	5.22	1.04	.423 (< .001, $1.13 \cdot 10^6$)	.603 (< .001, $1.51 \cdot 10^{15}$)	-

Note. Correlations above the diagonal for „Head full of Honey", below diagonal for „My Sister's Keeper". $N = 169$.

Table 2

Gender Differences in Valence Shifts and Self-Reported Emotional Flow

	Women (n = 110)		Men (n = 59)						
Variable	*M*	*SD*	*M*	*SD*	*t*	*df*	*p*	*d*	BF_{10}
Film excerpt from *Honey in the Head*									
Valence shifts	238.83	68.20	186.43	78.14	4.52	167	<. 001	0.73	2954.8
Emotional Flow	5.70	0.99	5.18	0.99	3.22	167	< .001	0.52	37.9
Film excerpt from *My Sister's Keeper*									
Valence shifts	232.19	72.78	189.41	79.72	3.52	167	<. 001	0.57	92.3
Emotional Flow	5.70	0.99	4.72	1.28	2.73	167	.003	0.44	10.3

Note. One-tailed t-tests.

Online Supplement for the Manuscript

Real-time Responses to Stories

S1 A Priori Sample Size Determination

We determined the required sample size a priori using G*Power (Faul et al., 2009). Given the five inferential tests postulated by our hypotheses, we set the level of alpha to .01 (Bonferroni correction). To detect a medium effect size of $r = .30$ for the correlations between self-reported emotional flow, valence shifts, and transportation, a sample of 122 participants would be necessary ($1-\beta = .80$, two-tailed, Pearson correlation). For a one-tailed t-test to detect a medium effect size of $d = .50$ for the proposed gender difference regarding self-reported emotional flow and valence shifts, a sample of 164 participants would be required ($1-\beta = .80$). To account for possible exclusions, we aimed for a sample of 168 cases.

Data was analyzed after data collection was completed.

S2 Participant Instructions for Operating the Slider

German

Bitte nehmen Sie das Gerät in Ihre dominante Hand.

Sie werden gleich einen Film ansehen. Uns interessiert, in welchem Ausmaß der Film Gefühle bei Ihnen auslöst. Schieben Sie den Regler umso weiter nach oben (+), je positiver Sie sich fühlen und umso weiter nach unten (-), je negativer Sie sich fühlen. Wenn Sie sich neutral fühlen, schieben Sie den Regler in die Mitte. Dabei gibt es keine richtigen oder falschen Reglereinstellungen.

Zu Beginn des Videos sehen Sie einen Countdown. Dieser zählt von 5 abwärts. Sobald der Countdown abgelaufen ist (bzw. keine Zahl mehr erscheint), drücken Sie bitte den roten Knopf in der rechten oberen Ecke des Reglers. Anschließend können Sie wie oben beschrieben während dem Sehen des Films Ihre Gefühle mittels des Reglers ausdrücken. Am Ende des Films erscheint erneut ein Countdown. Bitte drücken Sie nun ebenfalls, nach Herunterzählen des Countdowns, den roten Knopf auf dem Regler.

English Translation

Please take the device into your dominant hand.

You are about to watch a movie. We are interested into the extent to which this movie elicits feelings in you. Push the slider upwards (+) the more positive you feel, and push it downwards (-) the more negative you feel. If you feel neutral, put the slider in the middle position. There are no right or wrong slider positions.

At the beginning of the video, you will see a countdown, which counts from 5 on downwards. As soon as the countdown is finished (or no more numbers appear), please press the red button in the upper right corner of the slider. After that you can indicate your feelings while watching the movie using the slider as described above. At the end of the movie, a second countdown will appear. Once again, please press the red button on the slider after the countdown has finished.

S3 Backstories Presented Prior to the Film Excerpts

Honig im Kopf (German)

Der ehemalige Tierarzt Amandus Rosenbach leidet zunehmend unter Alzheimer. Auf Drängen seines Sohnes Niko zieht Amandus in dessen Haus nahe Hamburg. Nikos Ehe mit seiner Frau Sarah steht auf der Kippe, nachdem Niko erfahren hat, dass Sarah eine Affäre mit ihrem Chef hatte. Schnell kommt es wegen Amandus' geistigen Zustands zu mehreren kritischen Situationen, unter anderem verursacht er bei dem Versuch, einen Kuchen zu backen, beinahe einen Küchenbrand, den Sarah in letzter Sekunde verhindern kann.

Als Amandus' geistiger und motorischer Verfall immer weiter voranschreitet und deshalb das Sommerfest von Niko und Sarah in einem Fiasko endet, sieht Niko keine Alternative dazu, ihn in eine betreuende Einrichtung zu geben. Dies will dessen elfjährige Tochter Tilda nicht hinnehmen. Sie begibt sich mit ihrem Großvater auf eine Reise nach Venedig, wo Amandus seinerzeit mit seiner Frau die Flitterwochen verbracht hat. Von ihrem Kinderarzt Dr. Ehlers hat Tilda erfahren, dass es für Alzheimer-Patienten hilfreich sein kann, altbekannte Orte wiederzusehen.

Der Reisebeginn per Auto endet nach wenigen Kilometern mit einem glimpflich verlaufenden Unfall, als Amandus eine rote Ampel ignoriert. Per Zug geht es bis Bozen, dort verlässt Amandus auf der Suche nach einer Toilette versehentlich den Zug. Seine Enkelin zieht die Notbremse und versteckt sich mit Amandus auf der Bahnhofstoilette, bis die sie verfolgenden Polizisten die Suche aufgegeben haben. Am Abend werden sie vom Putzmann Erdal gefunden, er vermittelt den beiden eine Weiterfahrt nach Venedig. Als ihr Transporter von der Polizei angehalten wird, können Amandus und Tilda noch rechtzeitig vor ihrer Entdeckung von der Ladefläche fliehen.

Der folgende Filmausschnitt setzt an dieser Stelle ein. Amandus und Tilda konnten die Ladefläche des Transporters unbemerkt verlassen und setzen ihre Reise nun fort.

Head Full of Honey (English Translation)

The former vet Amandus Rosenbach suffers progressively from Alzheimer's disease. Urged by his son Niko, Amandus moves into his house near Hamburg. Niko's marriage to his wife Sarah starts to founder after Niko finds out that Sarah had an affair with her boss. Several critical situations arise within a short time, caused by Amandus' mental state. One such was when, in an attempt to bake a cake, he nearly set the kitchen on fire, which was prevented by Sarah in the last nick of time.

When Amandus' mental and motor abilities deteriorate so much that it causes Niko and Sarah's summer party to end in a fiasco, Niko sees no alternative but to place him into a care facility. His eleven-year-old daughter Tilda doesn't want to accept this. She goes on a trip with her grandfather to Venice, where Amandus spent his honeymoon with his wife. Tilda has learned from her pediatrician, Dr. Ehlers, that it can be helpful for Alzheimer's patients to see old familiar places again.

Their car journey ends a few kilometers in, after Amandus caused an accident by ignoring a red light. The journey continues by them taking a train to Bolzano, where Amandus inadvertently leaves the train while searching for a toilet. His granddaughter pulls the emergency brake and hides with Amandus in the station toilet until the police officers give up their search. In the evening, they are found by the cleaner Erdal, who arranges for the two to continue their journey to Venice. When their van is stopped by the police, Amandus and Tilda are able to escape from the loading area in time before being discovered.

The following film clip starts at this point. Amandus and Tilda were able to leave the loading area of the van unnoticed and now continue their journey.

Beim Leben meiner Schwester (German)

Sara und Brian Fitzgerald und ihre zwei Kinder Kate und Jesse leben ein unbeschwertes Leben, bis eine Ärztin eines Tages Leukämie bei Kate feststellt. Als weder der Sohn Jesse noch die beiden Eltern sich als passende Organspender für das Kind erweisen, treffen die Eltern die Entscheidung, eine weitere Tochter zu bekommen, die genetisch perfekt auf die Bedürfnisse ihrer großen Schwester angepasst sein soll. Auch wenn Kate die Ältere ist, hängt ihr Leben von nun an völlig von Anna ab. Immer wieder werden der Jüngeren Stammzellen und Knochenmark entnommen und die beiden Schwestern müssen sich langwierigen Krankenhausaufenthalten unterziehen. Die Eltern widmen ihre volle Aufmerksamkeit ihrer kranken Tochter, wodurch die beiden anderen Geschwister wenig Beachtung erfahren. Als schließlich Kates Nieren versagen, kommt Anna als einzige Spenderin infrage, doch die mittlerweile 11-Jährige trifft eine Entscheidung: Obwohl sie ein sehr enges Verhältnis zu ihrer Schwester hat, weigert sie sich nun, eine Niere zur Verfügung zu stellen. Sie möchte von nun an selbst über ihren Körper bestimmen. Gemeinsam mit dem Anwalt Campbell Alexander zieht sie gegen ihre eigenen Eltern vor Gericht.

Der Film besteht aus Szenen der Gegenwart (dem Gerichtsverfahren) und Szenen, in denen sich Kate an frühere Momente ihrer Krankheit erinnert. Bei einer solchen Erinnerung setzt der Film nun ein - Kate hat als Jugendliche den ebenfalls krebskranken Taylor kennengelernt und sich in ihn verliebt.

My Sister's Keeper (English Translation)

Sara and Brian Fitzgerald are living a carefree life with their two children Kate and Jesse, until one day a doctor diagnosed Kate with leukemia. When neither the son Jesse nor the parents turn out to be suitable organ donors for the child, the parents decide to have another daughter, who is to be genetically perfectly matched to the needs of her big sister. Even though Kate is the older one, from now on her life depends entirely on Anna. Time and again stem cells and bone marrow are taken from the younger one and the two sisters have to undergo long hospital stays. The parents devote their full attention to their sick daughter, which means that the other two siblings receive little attention. When Kate's kidneys finally fail, Anna is the only possible donor, but the now 11-year-old makes a decision: although she has a very close relationship with her sister, she now refuses to provide a kidney. From now on, she wants to determine what happens to her body. Together with the lawyer Campbell Alexander, she takes her own parents to court.The film consists of scenes of the present (the court proceedings) and scenes in which Kate remembers earlier moments of her illness. Through such a memory the film starts – as a teenager, Kate met Taylor, who also has cancer, and fell in love with him.

S4 Emotional Flow Self-Report Scale

Table S4

Items to Measure Overall Emotional Flow.

Item No.	Original German Version	English Translation
1	Die Geschichte hat mich emotional durchgerüttelt.	The story shook me emotionally.
2	Während ich die Geschichte verfolgte, habe ich nacheinander unterschiedliche Gefühle empfunden.	As I followed the story, I experienced a series of different emotions.
3	Die Geschichte hat mich auf eine emotionale Achterbahnfahrt mitgenommen.	The story took me on an emotional rollercoaster.
4#	Die Geschichte zu sehen war ein ständiges emotionales Auf und Ab für mich.	Watching the story was a constant emotional up and down for me.
5	Die Geschichte war ein Wechselbad der Gefühle für mich.	The story was an ever-changing mix of emotions for me.
6#	Beim Sehen der Geschichte habe ich wechselnde Gefühle erlebt.	While watching the story, I experienced changing emotions.
7	Mit dem Verlauf der Geschichte haben sich auch meine Gefühle verändert.	As the story progressed, my emotions changed.
8*	Egal was in der Geschichte passierte, ich habe überwiegend dasselbe dabei empfunden.	No matter what was happening in the story, I felt mainly the same way throughout.
9*#	Beim Sehen der Geschichte habe ich gleichbleibende Gefühle erlebt.	While watching the story, I experienced consistent emotions.

Note. Items were presented with response scales from 1 (not at all) to 7 (very much). The scale was translated to English using the committee method (van de Vijver & Leung, 1997): Three native speakers of the original language highly proficient in the target language translated the items independently. Then, they compared translations to develop a draft, which was verified by a native speaker in the target language.

* Items were reverse coded. # Wording needs to reflect mode of presentation

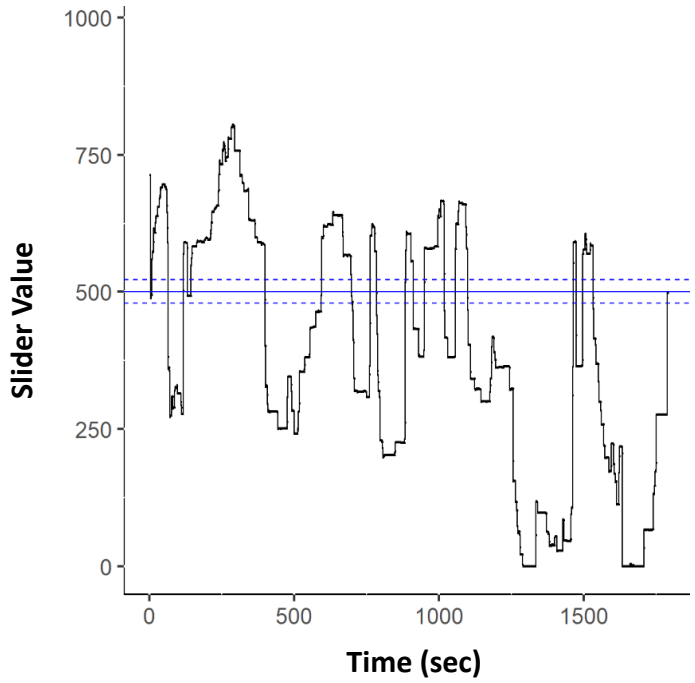
S5 Additional Measures not Reported in the Manuscript

We included measures to capture possible story-related attitudes for exploratory analyses. The measures and corresponding analyses are described in Supplement S8. Furthermore, we included some control measures: We assessed participants' left- or right-handedness using four items from the revised Lateral Preference Inventory (Büsch et al., 2009), and we asked which hand participants had operated the slider with after each film (see Supplement S7). Lastly, we asked participants if they had any personal experience with the issues addressed in the films (dementia, living organ donations), and whether they had seen the films before.

S6 Example Data Obtained Using the RTR Measure

Figure S6

Example RTR Data of Individual Participant (Honey in the Head)



Note. Sampling rate was 1 Hz. Within the area of the blue dotted lines a built-in linear motor generated a resistance for participants to sense the slider's neutral position (marked by the blue continuous line). Slider values range from 0 (maximum negative valence) to 1023 (maximum positive valence).

S7 Effects of Lateral Preference and Hand Used to Operate the Slider on RTR Data

We tested whether lateral preference and the hand participants used to operate the slider with affected the valence shift scores obtained with the slider. Lateral preference was coded as right-handed (n = 142) or left-handed (n = 4) if participants indicated the same lateral preference for all four tasks in the corresponding subscale of the Lateral Preference Inventory (Büsch et al., 2009). In all other cases, lateral preference was coded as mixed (n = 23). To test if lateral preference or the hand that was used during the film had an effect on valance shifts, we calculated Kruskal-Wallis tests, because the number of persons per cell was quite low in some cases. The hand used to operate the slider did not affect valence shifts significantly either for *Honey in the Head*, $H(2, N = 169) = 0.38$, $p = .828$, or *My Sister's Keeper*, $H(2, N = 169) = 1.07$, $p = .585$. Likewise, lateral preference did not affect valence shifts significantly either for *Honey in the Head*, $H(2, N = 169) = 1.60$, $p = .450$, or *My Sister's Keeper*, $H(2, N = 169) = 0.50$, $p = .778$. Means, standard deviations, and the mean of ranks are reported in Table S7.

Table S7

Descriptive Statistics of Valence Shifts by Lateral Preference and Hand Used During the Film

	Head Full of Honey				My Sister's Keeper			
	n	*M*	*SD*	M_{rank}	*n*	*M*	*SD*	M_{rank}
Lateral preference								
Left-handed	4	206.4	53.3	76.5	4	179.3	36.7	54.5
Right-handed	142	219.1	81.2	86.2	142	221.9	79.3	85.9
Mixed	23	207.8	58.4	79.4	23	219.3	55.6	85.0
Hand used to operate the slider								
Left	8	195.2	52.5	70.5	7	205.5	45.2	74.1
Right	157	218.8	79.1	86.1	157	221.0	77.2	85.4
Both	4	199.3	69.2	71.8	5	226.0	74.3	88.4

S8 Additional Analyses Regarding Story-Related Attitudes

Although our study was not designed to test persuasive effects of the stories and the stories were not created for persuasive purposes, we included measures to capture potential story-related attitudes for explorative analyses. The film *Honey in the Head* addresses issues faced by people with Alzheimer's disease and their families in a humorous and moving way and may thereby reduce stigma surrounding people with dementia. Therefore, we included the Dementia Attitude Scale (O'Connor & McFadden, 2010, German translation by Peng et al., 2011), which captures cognitive, emotional, and behavioral aspects of attitudes towards people with Alzheimer's disease and related dementias (ADRD; 20 items, e.g., "I feel uncomfortable being around people with ADRD", reverse coded item; Cronbach's $\alpha = .75$.). The film *My Sister's Keeper* addresses a moral dilemma faced by Kate's family: On the one hand, Kate lives thanks to her savior sister. On the other hand, this is only possible by causing suffering for Anna. The story does not provide a clear resolution to this dilemma. We created ten items to capture attitudes in favor of the decisions made by Kate and Anna's parents (e.g., "I think it is ethically justifiable that a child should donate its organs for a sibling"; Cronbach's $\alpha = .71$).

Table S8

Zero-Order Correlations (P-Values in Brackets)

	1	2	3	4
1. Valence shifts (RTR)	-	.432	.396	.139
		(< .001)	(< .001)	(.071)
2. Emotional flow	.410	-	.588	.204
	(< .001)		(< .001)	(.008)
3. Transportation	.423	.603	-	.294
	(< .001)	(< .001)		(< .001)
4. Attitude	.087	.115	.055	-
	(.261)	(.136)	(.476)	

Note. Correlations above the diagonal for „Head full of Honey“, below diagonal for „My Sister’s Keeper“. $N = 169$.

S9 Additional Analyses Regarding Comparison of Correlations

We conducted post-hoc analyses to check if the correlations between the two questionnaire scales were higher compared to the correlations between the RTR-based valence shifts and questionnaire scales. We used one-tailed tests implemented in the online-tool by Lenhard and Lenhard (2014). For both films, correlations between the two questionnaire scales were higher compared to correlations with the valance shifts obtained from RTR-data. The correlation between the transportation scale and the emotional flow self-report scale was significantly higher than the correlation between self-reported emotional flow and valence shifts, both for *Head Full of Honey, z* = 2.27, *p* = .012, and for *My Sister's Keeper, z* = 2.86, *p* = .002. The correlation between the transportation and emotional flow scales was also significantly higher than the correlation between transportation and valence shifts, both for *Head Full of Honey*, *z* = 2.83, *p* = .002, and *My Sister's Keeper*, *z* = 2.65, *p* = .004.

This observation can be explained in several ways. First, shared variance between the two questionnaire scales may arise from the use of the same method (Podsakoff et al., 2003). This method effect may have boosted the correlation between transportation and self-reported emotional flow, but no such effect can be expected for correlations with valence shifts. However, as our study does not provide a multitrait-multimethod design (Helm, 2021), this explanation cannot be tested empirically. Second, our valence shift measure operationalizes emotional shifts based on the valence component of emotion, whereas the emotional flow scale refers to emotional shifts in a broader sense (e.g., "I experienced changing emotions"). This may include, but is not limited to changes in emotional valence (e.g., shifts between discrete emotions of the same valence may not be captured by a valence measure). Valence shifts are one cue among others when participants filled in the emotional flow scale, and therefore correlations cannot be expected to be large.

References in the Supplement

Büsch, D., Hagemann, N., & Bender, N. (2009). Das Lateral Preference Inventory: Itemhomogenität der deutschen Version [Lateral Preference Inventory: item homogeneity of the German version]. *Zeitschrift für Sportpsychologie, 16*(1), 17-28. https://doi.org/10.1026/1612-5010.16.1.17

Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods, 41*, 1149-1160. https://doi.org/10.3758/BRM.41.4.1149

Helm, J. L. (2021). An introduction to advanced multitrait-multimethod analyses. In J. L. Helm (Ed.), *Advanced multitrait-multimethod analyses for the behavioral and social sciences* (pp. 1-15). Routledge. https://doi.org/10.4324/9780429320989

Lenhard, W., & Lenhard, A. (2014). *Hypothesis tests for comparing correlations*. Psychometrica. https://www.psychometrica.de/correlation.html

O'Connor, M., & McFadden, S. H. (2010). Development and psychometric validation of the Dementia Attitudes Scale. *International Journal of Alzheimer's Disease,* Article 454218. https://doi.org/10.4061/2010/454218

Peng, A., Moor, C., & Schelling, H. R. (2011). *Einstellung zu Demenz: Übersetzung und Validierung eines Instruments zur Messung von Einstellungen gegenüber Demenz und demenzerkrankten Menschen (Teilprojekt 1)* [Attitudes towards dementia: Translation and validation of a scale to measure attitudes towards dementia and people with dementia]. https://doi.org/10.13140/RG.2.2.12590.31041

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *Journal of Applied Psychology*, *88*(5), 879–903. https://doi.org/10.1037/0021-9010.88.5.879

Simon, R. W., & Nath, L. E. (2004). Gender and emotion in the United States: Do men and women differ in self-reports of feelings and expressive behavior? *American Journal of Sociology*, *109*(5), 1137–1176. https://doi.org/10.1086/382111

Van de Vijver, F. J., & Leung, K. (1997). *Methods and data analysis for cross-cultural research.* Sage Publications.

9 Manuscript 2: The Experience of Emotional Shifts in Narrative Persuasion

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The Experience of Emotional Shifts in Narrative Persuasion

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Abstract

Recent theory on narrative processes suggests that changes in recipients' emotional responses (emotional shifts) are characteristic of immersed story processing and precursors of narrative impact. In two experiments and a pilot study, a novel *self-probed emotional retrospection task* was used to measure emotional shifts. We examined the link between transportation and emotional shifts and the association of these processes with story-consistent attitudes, social sharing intentions, and behavior. We manipulated transportation via positive and negative reviews prior to story exposure. Consistent with theory, and across both experiments, we found that transportation was positively associated with the number and intensity of emotional shifts. Transportation was linked to affective-level attitudes in particular. While emotional shifts were not related to attitudes in Experiment 1, they were related to affective-level attitudes and social sharing intentions in Experiment 2. We further discuss the validity of emotional shifts measured through self-probed retrospections in the light of the results of the presented studies.

Keywords: emotional shifts, transportation, narrative persuasion, self-probed emotional retrospection method

The Experience of Emotional Shifts in Narrative Persuasion

The experience and impact of stories is a growing field of research in communication science, psychology, and related disciplines. Meta-analyses and narrative reviews underscore the potential of stories, fictional or non-fictional, to change recipients' attitudes, beliefs, and behavior (e.g., Green et al., 2020; Ratcliff & Sun, 2020; Van Laer et al., 2014). The persuasive influence of stories is typically explained by their ability to immerse recipients, a mental state referred to as transportation or narrative engagement. Recent theorizing has directed attention towards the role that the shifting emotional responses recipients experience throughout a story may play in the narrative persuasion process. The notion that emotion and transportation mutually facilitate one another has been advanced by many scholars in the past (e.g., Carroll, 1999; Oatley, 1994; Tan, 1996). According to recent theoretical work by Nabi and Green (2015), the emotional shifts that recipients of a story experience act as indirect motors of narrative persuasion by reinforcing transportation. Furthermore, emotional shifts are hypothesized to affect engagement with the narrative after exposure, such as information seeking or interpersonal communication, thereby extending narrative impact beyond message exposure. The purpose of this paper is to provide an empirical test of some of the core predictions put forward by Nabi and Green (2015; see also Nabi, 2015). Specifically, we focus on the relationship of emotional shifts with narrative transportation (Green & Brock, 2000) and the role emotional shifts play for story-consistent outcomes and social sharing intentions.

Empirical research on the dynamic experience of primary emotions when following a story is rare, which can be traced back to a scarcity of appropriate methodological approaches. We present the *self-probed emotional retrospection method* as a method to assess dynamic emotional experiences during story exposure. This method is first examined in a pilot study. In two subsequent experiments, levels of transportation are manipulated through positive vs. negative reviews. Experiment 1 tests the expected relationships between transportation,

emotional shifts, and story-consistent attitudes using a fictional love story. Experiment 2 aims to replicate and extend the results of Experiment 1 using a different narrative stimulus, a journalistic reportage. Furthermore, it takes on a more fine-grained view on story-consistent outcomes by examining effects on cognitive- and affective-level attitudes, donation behavior, and social sharing intentions.

Experiencing Narrative Worlds

Narrative effects are typically attributed to an immersed experiential state that is characteristic of story experience: Stories have the power to capture recipients' attention, to evoke a rich mental representation of the events unfolding, and to elicit strong emotions. Over the last two decades, several concepts have been developed to describe the state of being psychologically immersed in a story. A large amount of research on story experience is based on *narrative transportation* (Gerrig, 1993; Green & Brock, 2000) and the related construct of *narrative engagement* (Busselle & Bilandzic, 2008). Both concepts include the understanding of a story, constructing mental models, and building mental imagery (Busselle & Bilandzic, 2009; Gerrig, 1993). Transportation is argued to be a key mechanism for narrative persuasion to occur: In a state of heightened transportation, participants experience rich imagery of the story events, take over the perspective of the protagonists, and suspend processes (such as counterarguing) that lead to a resistance to change (Green & Brock, 2000; Moyer-Gusé, 2008; Slater & Rouner, 2002). Indeed, meta-analytic evidence shows that transportation plays a crucial role for persuasive outcomes (Tukachinsky & Tokunaga, 2013; Van Laer et al., 2014). Based on this foundational work, recent theory and research has increasingly acknowledged the intra-individual changes in recipients' experiential states during the course of a story (e.g., Appel, Schreiner et al., 2019; Bezdek & Gerrig, 2017; Nabi & Green, 2015). Our focus here is on affective responses, in particular the emotional ups and downs when reading or watching a story.

Emotional Shifts

Characteristic changes in events throughout the course of a story and related emotional content have been described in narrative theories since Aristotle (Aristotle, 367-322 B.C.E./2001; see for example Bordwell, 1985; Cutting, 2016; Freytag, 1863). In recent years, software-based corpus analyses have provided evidence of typical narrative patterns: For example, sentiment analyses of books in the Project Gutenberg fiction database show that stories generally follow one of six basic narrative arcs, which are characterized by dynamic changes in emotional content (Reagan et al., 2016). By getting swept up in a story, audiences therefore become susceptible to the dynamic emotional experiences implied by the narrative events. A major theoretical approach at reconstructing affective changes on the part of the recipient is provided by Nabi and Green (2015) who highlight the role of emotional shifts as part of narrative experience and persuasion before, during, and after story exposure. Emotional shifts are conceived as changes in the audience's emotional experience when following a narrative, "from negative to positive (e.g., fear to relief), from positive to negative (e.g., happiness to sadness), and even from one negative or positive emotional state to another of a similar valence (e.g., fear to anger or happiness to pride)" (p. 143). Nabi and Green use the term *emotional flow* to describe the succession of the emotional shifts that recipients experience. We rather prefer the term *emotional shifts* to avoid confusion with the concept of Csíkszentmihályi's *flow* which has also been applied to narrative persuasion research, but is a distinct concept (Green et al., 2020).

Narratives are an effective means to evoke different emotions because stories usually follow the journey of a protagonist faced with and overcoming obstacles or conflict. Audiences are inclined to evaluate the actions of the characters in a story and form affective dispositions towards them (Zillmann, 2006). This is bound to create dynamic emotional responses throughout the story as the characters face events and outcomes the audiences hoped for or feared. Nabi and Green (2015; see also Nabi, 2015) suggest that emotional shifts

drive narrative persuasion; first, by attracting audiences to specific content, second, by reinforcing narrative transportation, and third, by promoting post-narrative engagement. Furthermore, emotions have different action tendencies and implications for information processing, and may therefore serve different aspects of the persuasive message in a complementary way (Nabi, 2015). For example, the careful information processing and problem-solving tendency elicited by sadness may benefit long-lasting attitude changes, whereas the passiveness it is associated with may be alleviated by the activating properties of a positive emotion like happiness, which is related to more heuristic processing, feelings of trust, and sharing behavior (Nabi, 2002).

The influence of emotional shifts extends beyond story exposure: Narrative experiences characterized by emotional shifts may prompt audiences to different forms of post-narrative engagement. These may include processes like retrospective imaginative involvement with a story or parasocial relationships with its characters (Slater et al., 2018), and behaviors such as repeated reception of a story, information seeking, or social sharing and thereby extending persuasive influence into one's social network (Nabi & Green, 2015). Some studies highlight the role of emotion for stimulating interpersonal communication and information diffusion in social networks: Bartsch (2012) identified the social sharing of emotions (i.e., being inspired to talk about a movie with others) as one of the emotional gratification viewers gain from movies and television series and suggests that social sharing may play an important role for emotion regulation. Other studies show that emotionally charged content is more likely to be shared and spreads faster on social media than more neutral content (e.g., Stieglitz & Dang-Xhuan, 2013).

Following Nabi and Green (2015), we assume that emotional shifts and the experience of transportation are processes that reciprocally drive one another: On the one hand, emotional shifts help sustain attention to a narrative and facilitate states that are critical for persuasive effects (e.g., transportation) through excitation transfer (Zillmann, 1996), by

creating suspense (e.g., Bezdek & Gerrig, 2017), and by prompting orienting responses that direct cognitive resources to the evolving story (Clayton et al., 2019). Conversely, the likelihood to experience emotional shifts consistent with the story should increase with one's narrative transportation (Appel, Schreiner et al., 2019; Nabi & Green, 2015). Busselle and Bilandzic (2008) describe narrative engagement in terms of deictic shifts theory (Segal, 1995), highlighting that the story world becomes the world of reference to the recipients, which is a requirement for emotional engagement. Particularly for written stories, in which blatant visual and auditive cues are missing, attentional focus, narrative understanding and vivid imagination of the events unfolding are prerequisites for experiencing the emotional shifts implied by the story. These aspects are core components of narrative transportation. Therefore, transportation should facilitate audiences' experience of the emotional ups and downs of a story.

Emotional shift theory leads to a range of testable predictions (Nabi & Green, 2015), but assessing emotions that are experienced at different time points in a story is a methodological challenge. Thus, research on the dynamic experience of emotions when reading, watching, or listening to a story and its role for persuasive outcomes is scarce. Several studies manipulated the emotional content of a narrative and assessed the influence on narrative persuasion (Appel & Richter, 2010; Carrera et al., 2008; 2010; Hamby & Brinberg, 2016; Rossiter & Percy, 1991; Rossiter & Thornton, 2004). Some health communication studies suggest that storylines with changing emotional content, such as a shift from negative to positive (Carrera et al., 2010, Rossiter & Thornton, 2004) or from positive to negative valence (Carrera et al., 2008), are more persuasive than a story with negative valence throughout.

These studies manipulated story content which may have led to a range of psychological effects, including, but not limited to, emotional shifts. Moreover, whether or not emotional shifts were affected by these manipulations remains an open question, because

no measure of emotional shifts was employed. To date, there is little empirical evidence on the link between recipients' experience of emotional shifts and transportation or between emotional shifts and story-consistent attitudes and behavior. To address this research challenge, we introduce and apply a method that measures emotional responses in the moment they occur.

Measuring Emotional Shifts

There are several ways to assess online emotional responses to a narrative, for example psychophysiological measures to capture the arousal (and, to some extent, valence) dimension of emotion, observations of facial expressions, or assessment of brain activity (Mauss & Robinson, 2009). However, all of these options are resource intensive and require complex data analysis. Furthermore, scholars disagree on the question if any of these methods is suitable as a stand-alone measure of emotional reactions beyond their basic affective dimensions (i.e., valence and arousal; Siegel et al., 2018; Kreibig, 2010; Mauss & Robinson, 2009).

Self-report measures offer insights into the subjective feeling component of emotion and are commonly used due to their easy implementation and interpretation (Lang & Ewoldsen, 2011). The study of emotional dynamics as narrative processes requires a method that allows for assessing emotional states multiple times during story exposure while keeping interference with the narrative experience itself to a minimum. On the other hand, retrospective accounts of emotions felt during different parts of a story are likely to be impaired by different biases. Importantly, the accessibility of episodic memories may decrease with time, causing participants to rely on generalized beliefs about emotions instead (Robinson & Clore, 2002, cf. Walentynowicz et al., 2018). Real-time response (RTR) measures that allow participants to indicate their experiences using a rating dial provide one way to approach this problem (Biocca et al., 1994; see Siegenthaler et al., 2021 for an implementation within the emotional shifts framework). However, to avoid interference with

narrative experiences, assessment of emotion is limited to one dimension (Lang & Ewoldsen, 2011).

The work presented here utilizes a method to investigate emotional changes as they occur in an efficient and accessible way: The *self-probed emotional retrospection method*. This method is based on Larsen and Seilman (1988; Seilman & Larsen, 1989) who were interested in story-cued remindings during reading: Whenever a memory occurred, readers had to mark an "M" (for memory) at the text margins. This method was adapted by Eng (2002, described in Mar et al., 2011) who aimed at capturing emotional responses to expository texts and written narratives while minimizing interference with narrative engagement. Participants were instructed to mark an "M" at the text margin for a memory, and an „E" to signify an emotional response. After they finished reading, they returned to their e-markings to elaborate on their experiences. Self-probed retrospections – focused on emotional experiences – allow for a richer assessment of readers' emotional experiences than RTR procedures. At the same time, the "E"s participants draw on the text margin act as cues that later enable the recall of one's emotional experiences rather than their retrospective (and more likely to be biased) reconstruction. Similar cued-recall procedures have been validated as approximative measures of real-time assessments of emotion. For instance, Mauss et al. (2005) found that online-ratings of amusement and sadness obtained with a rating dial participants operated during film viewing correlated strongly with continuous cued-recall ratings of these emotions. Furthermore, cued-recall ratings were coherent with physiological arousal measures obtained during the initial viewing of the film. Similarly, McCall and colleagues (2015) measured physiological arousal (skin conductance and heart rate) of participants who were immersed in a threatening scene via virtual reality. Afterwards, participants re-watched the scene on a computer and provided continuous ratings of their arousal during the virtual reality setting. The study found high coherence between the physiological arousal patterns and the retrospective reports. Overall, there is strong evidence

of the concurrent validity of cued-recall measures of continuous emotional experience, which should apply to self-probed emotional retrospections as well. Furthermore, a few studies have successfully applied this method to capture varying affective responses to narratives (Eng, 2002; Koopman, 2016). For instance, Koopman (2016) used self-probed retrospections to assess the effects of different literary techniques. This study found that stories using foregrounding resulted in more reports of ambivalent emotions, and both imagery and foregrounding led to more reports of aesthetic emotions, which speaks to the sensitivity of the measure to capture emotional experiences of different quality.

Study Overview and Predictions

We present a pilot study and two experiments that examined emotional shifts with the help of the *self-probed emotional retrospection method*. Emotional shifts were quantified using two indicators: The number and the intensity of emotional shifts. Based on this method we were able to investigate the theoretically proposed reciprocal relationship between transportation and emotional shifts and their respective roles for enhancing story-consistent attitudes, behavior, and post-narrative engagement (Nabi, 2015; Nabi & Green, 2015).

We predicted that with higher levels of transportation, the number of experienced emotional shifts and the intensity of the shifts should increase (Hypothesis 1). We further expected that the higher the number and intensity of emotional shifts, the more recipients endorsed story-consistent attitudes (Hypothesis 2a), reported the intention to share the story (Hypothesis 2b), and engaged in story-consistent behavior (Hypothesis 2c).

Given the difficulties associated with manipulating the emotional content of a story independently from the persuasive messages conveyed with it, the experiments incorporated an experimental manipulation of transportation as a causal anchor in our model. Transportation was manipulated with the help of negative versus positive reviews presented in advance, a method that has shown consistent and reliable effects on narrative transportation (e.g., Isberner et al., 2018; Shedlosky-Shoemaker et al., 2011; Tiede & Appel, 2020).

According to Tan (1996), the extent to which media users invest cognitive and emotional resources in the processing of a stimulus depends on their expectations of the gratifications to be derived from it. Reviews shape these expectations: If readers assume they are about to read a bad story, they are less likely to invest resources while reading and therefore experience lower levels of transportation (see Tiede & Appel, 2020, for a detailed introduction of the theoretical background and empirical support). Thus, we expected that a negative review about the story (vs. positive or no review) before reading the story would decrease levels of transportation (Hypotheses 3a and 3b). Although we intended the reviews mainly for the manipulation of transportation, they may also affect the experience of emotional shifts. However, it is uncertain if the extent to which readers experience emotional shifts is malleable by information other than the narrative itself. Studies manipulating emotional shifts did so by altering story structures and events (e.g., Carrera et al., 2008; Carrera et al., 2010). Therefore, we posed the research question: Do negative reviews (vs. positive or no review) have a negative effect on the experience of emotional shifts? Based on prior research (Tukachinsky & Tokunaga, 2013; Van Laer et al., 2014), we expected that transportation predicts story-consistent attitudes, sharing intentions and behavior (Hypotheses 4a, 4b, and 4c). The first four hypotheses constitute a two-step mediation model with the review manipulation as an independent variable, and attitudes, sharing intentions, and behavior as dependent variables. Transportation and emotional shifts served as sequential, i.e., successive mediators (Hypotheses 5a, 5b, and 5c for the three dependent variables).

Pilot Study

Our work started with a pilot study. The primary goal of this pilot was to test the feasibility of the self-probed emotional retrospection method and to gain insight into its validity. As a means to evaluate the construct validity of self-probed emotional retrospections, we assessed participants' need for affect. This trait explicates "people's tendency to experience, explore, communicate, and use their emotions to guide behavior" (Maio & Esses,

2001, p. 592). Assuming that the self-probed retrospection method is a suitable tool to capture emotional experiences of varying intensity, individuals' need for affect should be positively related to the extent to which participants report emotional experiences. Following Bartsch and colleagues (2010), our expectations concerning emotional experience were focused on the approach component of the need for affect. Moreover, the pilot study was meant to examine the review manipulations and the persuasive effect of the stimulus material. To create favorable versus unfavorable conditions for transportation, we presented participants with either a positive, a negative, or no review about the story beforehand (Shedlosky-Shoemaker et al., 2011; Tiede & Appel, 2020).

Institutional approval is not a requirement for psychological research in Germany, as long as it does not relate to issues regulated by law. However, the studies presented in this article were conducted in full accordance with the Declaration of Helsinki, as well as the ethical guidelines provided by the German Psychological Society (DGPs). Informed consent was obtained from all subjects before taking part in the studies.

Method

Participants and Design

A total of 146 individuals participated in the study. Participants were students at the University of Koblenz-Landau at Landau, Germany, 22.77 years old on average (SD = 4.54), and predominantly female (n = 96). The experiment followed a one-factorial design with three conditions (negative review vs. positive review vs. no review introducing the story). In the no review condition, story-related attitudes were assessed before the story as a way to examine non-exposure attitudes.

Story and Manipulation of Story Experience

All participants read the short story *Das Ende der Reise* (*The end of a journey*, 3180 words, Bjarnason, 2011). The story is set in a retirement home in Iceland. Stina, a widow who lives in the retirement home feels lonely and frequently engages in daydreaming and

reminiscing. Many years ago, she met Jon at a midsummer night festivity, and they had an affair, but they lost track of each other. One day a new resident of the retirement home is introduced – it is Jon. They revive their romantic relationship and spend a joyful time together. Retirement home officials as well as their families, however, disapprove of their relationship and Stina is scheduled to be relocated to a different place. Facing this involuntary separation, the couple jointly commits suicide.

Before reading the short story, participants were presented with a fictitious review about the story, ostensibly written by a literary critic. The review was positive, negative, or no review was provided (control condition). The positive review praised the story for its vivid descriptions, its ability to immerse the reader and to be touching and moving. The negative review contained negative evaluations of the same aspects and described the story as one-dimensional, superficial, and unable to immerse or touch the reader (see Online Supplement S1 for the exact wordings). After reading the review, participants were asked to summarize it in one or two sentences.

Self-Probed Emotional Retrospections

While reading the story, participants marked any section of the text in which they experienced an emotional response with an „E“ on the margin. This task was introduced with a brief practice text before the experimental material was presented. After reading the complete story, participants were asked to specify the emotions they experienced. To this end, they had to number all „E“s and rate the intensity of each of six basic emotions (anger, happiness, sadness, fear, surprise, and disgust) for every „E“ using a scale from 1 (not at all) to 7 (completely). We instructed participants to unite „E“s that were placed within three lines of the text and expressed the same emotional response.

Measures

Emotional Experience. We counted the number of "E"s participants marked during the story as an indicator for individuals' tendencies to report emotional experiences.[3]

Need for Affect. We assessed subjects' need for affect using the Need for Affect Questionnaire-Short Form (NAQ-S, Appel et al., 2012). This measure consists of two subscales comprising five items each (AV = avoidance tendency subscale, e.g., "I would prefer not to experience either the lows or the highs of emotion", AP = approach tendency subscale, e.g., "I feel that I need to experience strong emotions regularly"). Items were rated on a scale ranging from 1 (not at all) to 7 (very much). Cronbach's α was .65 for the approach tendency subscale and .76 for the avoidance tendency subscale.

Transportation. Transportation was measured with the German version of the Transportation Scale-Short Form (Appel et al., 2015). The scale consists of six items (e.g., "I could picture myself in the scene of the events described in the narrative") and a rating scale from 1 (not at all) to 7 (very much). For the two items capturing the imaginative component of transportation ("While reading the narrative I had a vivid image of [character]"), character names Stina and Jon were inserted (α = .81).

Attitude Measures. From a persuasion perspective, the story addressed two main topics, the acceptance of romantic love among individuals residing in retirement homes and attitudes towards suicide for elderly people as a self-determined end of life. We created five items to assess recipients' *attitude towards suicide in old age* (e.g., "It should be possible to end one's life in old age without any greater resistance", α = .67). Five additional items measured recipients' *attitude towards old-age romance* (e.g., "Romantic relationships in old age should be actively encouraged", α = .60). The attitude items went with 7-point response

[3] Note that we only use this measure in the pilot study, not in the main experiments, as an indicator for the extent to which individuals experience and report emotional responses. This pilot study addresses the utility of the self-probed emotional retrospection method to capture varying emotional experiences and its sensitivity to individual differences in subjects' need for affect. The pilot study is not intended to test our predictions regarding emotional shifts. Furthermore, problems encountered in the procedure (see below) led us to discard the emotion ratings.

scales, ranging from 1 (not at all) to 7 (very much). All items are documented in Supplement S2.

Procedure

Participants entered the lab individually or in groups of up to four. Each participant was randomly assigned to one of the three conditions. First, they completed the need for affect questionnaire. Next, the self-probed emotional retrospection procedure was explained by the experimenter. Participants in the review conditions now read and summarized the review, whereas the control group answered the attitude questions. Then, participants read the story and completed the e-marking task. Immediately after reading, they answered the transportation items and then specified emotional experiences for each „E“. Participants in the review conditions then completed the attitude items. Finally, all participants answered sociodemographic questions and were thoroughly debriefed.

Results

Overall, the general procedure of the self-probed retrospections appeared to be comprehensible and workable. However, there was great variation in the number of “E”s participants originally marked (M = 36.36, SD = 25.21, min = 4, max = 122). Due to the high number of „E“s to be qualified for some subjects and a fixed timeframe allocated per session, 50 participants were unable to finish the questionnaire and rate all “E”s, leading to a high number of non-random missing values. These cases were excluded from further quantitative analyses. Another participant was excluded because of missing data in the transportation scale, and one participant noted that they did not work on the study conscientiously, leaving a final sample of 94 participants (age: M = 22.81, SD = 5.18, n_{female} = 58). The number of „E“s in this sample ranged from 4 to 69 (M = 22.49, SD = 13.16, Mdn = 19).

As an indicator for the construct validity of the instrument, we used the remaining sample to examine the relationship between response patterns in the self-probed emotional retrospection task and participants’ need for affect. Importantly, the number of „E“s

participants stated was positively related to the approach dimension of the need for affect (r = .230, p = .025), but unrelated to the avoidance dimension (r = –.031, p = .769; see Supplement Table S3a).

Next, we checked whether reading the positive vs. negative reviews affected participants' levels of transportation as intended. Results of a univariate ANOVA show that indeed, groups differed significantly with regards to transportation, $F(2, 91) = 3.86$, p = .025, ω^2 = .06. This effect was driven by the negative review, which lowered participants' transportation (Table S3b). Finally, we were interested if there was a persuasive effect with regard to the attitudes we identified as relevant to the story. Univariate ANOVAs yielded no significant effect of condition with respect to attitudes towards old-age romance, $F(2, 91)$ = 2.75, p = .070, ω^2 =.04, and attitudes towards old-age suicide, $F(2, 91) = 2.99$, p = .055, ω^2 =.04. However, for both variables means were lowest in the control condition and highest in the positive review condition. Post-hoc analyses revealed that this difference was significant for attitudes towards old-age romance and approached significance for attitudes towards old-age suicide (Table S3b).

Discussion and Implications for the Main Experiments

The pilot study provided encouraging results regarding the feasibility and validity of the self-probed emotional retrospection measure. That said, the issues encountered regarding the extreme number of "E"s to be qualified by some participants called for some modifications of the procedure for our main experiments. Whereas limiting the number of "E"s to be assigned by participants before reading the story seemed inappropriate given the likely influence on the task's cognitive demand and the reading experience, we decided to add a step to the procedure. After participants finish reading the story and assigning their "E"s, they are asked to revisit their "E"s and select a maximum of a given number of "E"s that they consider most relevant. These selected "E"s are then qualified with regard to the emotions experienced. The limit of "E"s to be selected greatly depends on the story used. Based on the

median of 19 of the number of „E“s in the pilot, we deemed a limit of 24 in Experiment 1 (using the same story) a sufficient number to capture a broad spectrum of emotional experiences of the narrative. This limit allows for more predictable participation times and avoids fatigue on the side of participants, which may otherwise compromise data quality and cause non-random missing values resulting from dropouts. Moreover, setting a predefined limit as a frame of reference should help balance out inter-individual differences in subjects' response tendencies to report more or less „E“s.

The results regarding the review manipulation of transportation and the persuasive effects of the story seemed promising. Although we found a significant difference between the positive and the control group with regards to attitudes towards old-age romance only, this may have been due to a lack of power caused by the large number of subjects we had to exclude. Therefore, we retained both attitude variables for the main experiment.

Experiment 1

Experiment 1 tested the relationships between transportation, the experience of emotional shifts, and story-consistent attitudes. We used the same materials and review manipulations as in the pilot study. Based on the experiences gained from the pilot study, a few changes were made with regard to the procedure of the self-probed emotional retrospections.

Method

Participants

Our main hypothesis was the association between transportation and emotional shifts. A priori sample size was determined with the help of g*power (Faul et al., 2009). Given a two-tailed test for a Pearson correlation, $\alpha = .05$ and power $(1-\beta) = .80$, a total of 123 participants would have been required to find a small-to-medium effect size of $r = .25$. A second aspect that guided our sample size were the main effects of the review manipulation on transportation. Our pilot study yielded a main effect difference of Cohen's $f = .31$ (which is

similar to the $\eta^2 = .10$ that Tiede and Appel, 2020, Experiment 1, observed). Given a two-tailed F-test, $\alpha = .05$ and power $(1-\beta) = .80$, a total sample size of 102 participants were required (i.e., less than for the continuous measures associations). Thus, the sample size was based on the 123 participants required for the focal association. To account for potential exclusions, we set a goal of 140 participants in our lab experiment. Students of the University of Würzburg, Germany, participated for partial course credit. Of the 141 participants in the study, four had to be excluded because the experiment was disrupted by a security alert. We excluded another four because of missing data in the attitude measures, and two participants who did not pick the most relevant „E"s across the whole story but instead the first „E"s in the order of their appearance, thereby ending their e-specifications in the middle of the story (details on the procedure can be found below). One participant was excluded because they specified less than half of the 24 „E"s. One participant recommended that their data should not be analyzed (at the end of the questionnaire, participants were asked if they had answered all questions conscientiously and if they recommended their data to be analyzed or not). Another one was excluded because they indicated insufficient language abilities. The remaining 128 participants were 20.84 years old on average ($SD = 2.48$), and most of them ($n = 90$) were female.

Self-Probed Emotional Retrospections

After reading the experimental story and completing the e-marking task, participants were instructed to select and number up to 24 of the most relevant „E"s and to specify their emotional experience for each by rating the intensity of six emotions (anger, happiness, sadness, fear, surprise, disgust) on a scale from 1 (not at all) to 7 (completely).

Coding of Emotional Shifts

We operationalized the degree to which participants experienced emotional shifts (1) by coding the number of emotional shifts reported over the course of the narrative, and (2) by computing a measure for the intensity of emotional shifts from the sum of absolute

differences across e-specifications (for additional information on the treatment of missing values during the coding of these variables, see Supplement S12).

Number of Emotional Shifts. The occurrence of an emotional shift was computed using the following rules: a) For each experience the emotion with the highest score was specified as the dominant emotion. b) Whenever two or more emotions obtained the highest score, this was specified as a mixed dominant emotion. c) An emotional shift was coded when the dominant emotion or mixed dominant emotion changed to a different dominant emotion or mixed dominant emotion. We then counted the number of emotional shifts for each participant. Count variables tend to violate common distribution assumptions. In our case, however, the distribution did not substantially differ from a normal distribution (skewness = -0.60, SE = 0.21; kurtosis = 0.06, SE = 0.43; see Supplement S11 for statistics and a graphical depiction of the distributions of this variable for both experiments).

Intensity of Emotional Shifts. For each emotion, we calculated and summed up the absolute differences between subsequent e-specifications, resulting in six new variables (one each for sadness, happiness, anger, fear, surprise, and disgust). Internal consistency among these variables was good (Cronbach's $\alpha = .85$). We then summed up the six individual scores into one variable, which indicates the quantity of shifts in emotional intensity ratings while reading the story. We illustrate the calculation of this variable with an example in Supplement S12.

Measures

The same measures were used as in the pilot study (transportation Cronbach's $\alpha = .83$, attitudes towards old-age suicide $\alpha = .76$, and attitudes towards old-age romance $\alpha = .59$).

Procedure

The same procedure was employed as in the pilot study, except that participants in the control group (no review) answered the attitude items at the end of the questionnaire instead

of beforehand. Furthermore, we asked participants to pick a maximum of 24 of their most relevant „E“s to specify.[4]

Results and Discussion

We used two indicators to quantify emotional shifts (number and intensity) and two measures for story-consistent attitudes. To avoid alpha-error accumulation, α was adjusted respectively prior to the inference statistics (Holm-Bonferroni correction).

Table 1 presents the zero-order correlations between the main variables. As expected in Hypothesis 1, the number of emotional shifts, $r(126) = .324$, $p < .001$, as well as the intensity of emotional shifts, $r(126) = .448$, $p < .001$, were positively associated with recipients' transportation into narrative worlds. Among the four correlations between emotional shifts and story-consistent attitudes, only the link between intensity of emotional shifts and attitudes towards old-age romance approached significance, $r(126) = .197$, $p = .026$. Given that Hypothesis 2a was represented by four associations, the Holm-Bonferroni-adjusted α was .0125. Thus, Hypothesis 2a was not supported. No evidence was found that experiencing emotional shifts is associated with story-consistent attitudes.

Next, we tested whether reading a negative review prior to the story decreased transportation compared to a positive review and compared to no review (Hypotheses 3a and 3b). Results from a univariate ANOVA show that the three conditions differed significantly in terms of transportation, $F(2, 125) = 4.47$, $p = .013$, $\omega^2 = .05$. Post-hoc comparisons using the Games-Howell test (Sauder & DeMars, 2019) revealed that levels of transportation were lowest for participants who read the negative review. The significant difference in transportation was driven by the difference between the negative review and the no review

[4] As in the pilot study, we measured participants' need for affect in both experiments. To keep the article concise, all results regarding this individual difference measure are reported in Supplement S9.

group (see Table 2 for group means and group comparison *p*-values). Thus, results provide support for H3b but not for H3a.

Supporting Hypothesis 4a, transportation was related to attitudes towards old-age romance, $r(126) = .345$, $p < .001$, but transportation was unrelated to attitudes towards old-age suicide, $r(126) = .035$, $p = .698$.

To test for a mediation of the effect of reading a story with either a positive, a negative, or no review on story-consistent attitudes via transportation and emotional shifts (H5a), we estimated four sequential mediation models using PROCESS v3.5 (Model 6, 5000 bootstrap samples; Hayes, 2018). Review conditions served as independent variables ($X1$ = negative review vs. no review, $X2$ = negative review vs. positive review), transportation ($M1$) and number or intensity of emotional shifts ($M2$) as mediators, and one of the two attitude measures as the dependent variable. The results of these two-step mediations are depicted in detail in Supplement S4. The total effect of the treatment on attitudes was not significant in any of the models. Thus, no evidence was found that emotional shifts mediate the influence of transportation on attitudes as predicted by Hypothesis 5a. Further, the findings from these mediation models can be related to our research question whether reviews affect not only transportation but also emotional shifts more directly. While a negative review affected transportation negatively compared to no review and transportation was positively related to both the number and intensity of emotional shifts, there was no direct effect of the review conditions on either of the two emotional shift variables.

In sum, the results of this study provide some initial evidence of the link between transportation and the experience of emotional shifts as postulated by Nabi and Green (2015). However, we did not find evidence of a relationship between shifts and story-consistent attitudes.

Experiment 2

Experiment 2 extended and refined the design of our previous experiment in several ways. To increase generalizability, we used a different stimulus text that represents a different narrative genre (journalistic reportage). Again, the experimental treatment included a positive vs. negative review of the experimental story. This time, we included a third group where participants read a text unrelated to the dependent variables to enable a control of the overall persuasive impact of the main stimulus story. Finally, we refined our assessment of narrative impact. In Experiment 1 our attitude measures did not allow us to examine whether the experience of transportation and emotional shifts is related to outcomes on different levels. However, meta-analytic evidence suggests that the persuasive potential of narratives pertains to affective outcomes and intention in particular (Zebregs et al., 2015). Therefore, we included measures for story-related cognitive- and affective-level attitudes and a behavioral measure of persuasive effects in this study. Taking up Nabi and Green's (2015) prediction that the experience of emotional shifts fosters post-narrative engagement, we further included a measure for social sharing intentions as a dependent variable.

Method

Participants

A priori sample size determination was the same as for Experiment 1. Participants (N = 139) were recruited on campus of the University of Würzburg, Germany, and participated for a monetary compensation of €12. Two participants were excluded because errors in completing the self-probed emotional retrospection task rendered their responses unusable. One participant was excluded from the sample because consent was retracted after the experiment and another one for missing data in all dependent variables, leaving a final sample of 135 participants. Participants were 23.42 years old on average (SD = 6.09), mostly female (n = 89), and students of the university (n = 126).

Design

The experiment was based on a three-group between-subjects design. Participants in two conditions read a text about a farmer in Burkina Faso who revolutionized harvesting techniques in the Sahel region. The text was preceded by a positive or a negative review to manipulate narrative transportation. In the third condition, participants read a different story that was unrelated to the dependent variables in this study. Story-consistent attitudes were assessed at the cognitive, affective, and behavioral level. We further included a measure for social sharing intentions.

Stories and Manipulation of Story Experience

All participants read a journalistic reportage employing storytelling techniques. Participants in the two review conditions read a version of the story *Der Mann, der die Wüste aufhielt* [The man who stopped the desert] (Jeska, 2012). The original text was slightly shortened to 2547 words. The text tells the story of Yacouba Sawadogo, a farmer from Burkina Faso who developed techniques to improve harvest and stop desertification of the Sahel region by planting and cultivating several hectares of forest. Furthermore, the reportage addresses the history and dysfunctionality of most Western developmental aid in the Sahel region. Yacouba's techniques attract international attention and cause a shift in the United Nation's developmental aid strategies. However, Yacouba's success story features setbacks caused by locals' initial skepticism towards his techniques and bureaucratic hurdles that threaten the existence of his forest.

The third group read the reportage *Bis zum Letzten* [To the last] (Buhl, 2018) which tells the stories of a group of unsuccessful but persevering marathon runners. This control story was similar to the experimental story in length (2601 words) and quality (both stories won the same journalism award in the same category), but unrelated to the issues addressed by the experimental story.

Like in Experiment 1, we used positive and negative reviews to manipulate levels of transportation. The reviews were presented as background information about the text participants were about to read. The positive review praised the story for its coherence, vivid descriptions, and for being able to move and immerse the reader, while the negative review criticized it for a lack thereof. Both reviews made references to the author's (lack of) skillfulness and professionalism to manipulate quality expectations while being careful to not cast doubts on the truthfulness and plausibility of the story itself (see Online Supplement S5).

Self-Probed Emotional Retrospections

The task was administered like in Experiment 1. The number of „E"s participants were asked to pick and rate was limited to 18. This amount was estimated by generously counting the number of events and passages in the text that held emotional potential.

Measures

Cognitive- and Affective-Level Attitude Measures. Four items measured the extent to which participants endorsed cognitive-level story-consistent attitudes concerning the inappropriateness of European agricultural standards in Africa (e.g., "Solutions to improve harvests in Africa have to come from European industrial nations", reverse-coded, $\alpha = .87$). This issue is explicitly addressed in the story. Another core issue in the experimental story is the lives and struggles of the people living in the Sahel. Therefore, four items were created to reflect the degree to which participants felt a sense of emotional involvement with this group (e.g., "I feel close to the people living in the Sahel region", $\alpha = .78$). All items were assessed on 7-point rating scales from 1 (disagree completely) to 7 (fully agree). The item wordings of all scales can be found in Supplement S6.

Social Sharing Intentions. Participants indicated the likelihood of engaging in different social sharing activities. Two items specifically addressed activities on social media (e.g., "I would share this story on social media [e.g., Facebook, Twitter]"), another three described more general modes of communication (e.g., "I would discuss the issues addressed

in the story with friends, acquaintances, or family members"). Internal consistency of this measure was good in both the experimental groups (Cronbach's α = .82) as well as the control group (α = .88).

Behavior. Participants in all groups were given the option to donate a freely chosen share of their 12€ compensation to the non-profit organization Terra-Verde e.V. They received a brief description of the goals of this organization, which pertain to the issues addressed in the experimental story (stopping desertification of the Sahel region). Participants were asked to note the amount they wished to donate (see Supplement S12 for additional information).

Procedure

Participants entered the lab individually or in groups of up to ten and were assigned to one of the three conditions randomly. After providing sociodemographic information, participants were introduced to the e-marking task and practiced the procedure using an example story. Participants in the review conditions then read and summarized either a positive or a negative review of the following stimulus story. Participants who read the Marathon reportage received neutral background information regarding the story. After reading the story and completing the e-marking task, participants immediately answered the transportation items. Then they proceeded with the e-specification task. Lastly, dependent variables were assessed. In a separate room, participants were compensated, were given the opportunity to make a donation, and were debriefed.

Results and Discussion

Again, because two indicators served as measures emotional shifts, we adjusted the alpha-level (Holm-Bonferroni) to account for α-error accumulation where appropriate. Comparisons to the control story show that our stimulus story was indeed persuasive (positive or negative review condition) with regard to cognitive-level attitudes. Affective-level attitudes and social sharing intentions were significantly higher in the positive review group compared

to the control story, but not in the negative review group. Donations were not affected by the treatment. For detailed results on the persuasive effect of our stimulus story versus the control story, see Supplement S8.

The following main analyses pertain to the groups that read the desertification story. Zero-order correlations between key variables are reported in Table 3. Consistent with Hypothesis 1 and the results from Experiment 1, transportation was positively associated with both the intensity, $r(89) = .368$, $p < .001$ (Holm-Bonferroni-adjusted $\alpha = .025$), and the number of emotional shifts, $r(89) = .222$, $p = .035$ (Holm-Bonferroni-adjusted $\alpha = .05$), for readers of the desertification story.[5] Hypothesis 2a predicted a positive relationship between emotional shifts and story-consistent attitudes. However, our two emotional shift indicators were not correlated with cognitive- and affective-level attitudes. Thus, Hypothesis 2a was not supported. As predicted in Hypothesis 2b, social sharing intentions increased significantly with both the intensity, $r(89) = .346$, $p < .001$ (Holm-Bonferroni-adjusted $\alpha = .025$), and the number, $r(89) = .216$, $p = .040$ (Holm-Bonferroni-adjusted $\alpha = .05$) of emotional shifts. Thus, Hypothesis 2b was supported. Hypothesis 2c predicted a positive association between the experience of emotional shifts and the amount donated in favor of a story-related charity (our behavioral measure). We conducted a logistic ordinal regression with the two emotional shift variables and transportation as predictors and donations as the criterion. For readers of the desertification story, odds for a higher donation for a story-related cause did neither increase significantly with the number of emotional shifts ($OR = 1.03$, 95% CI [0.84; 1.25], $\chi^2(1) = 0.068$, $p = .794$), nor with the intensity of emotional shifts ($OR = 1.00$, 95% CI [0.99; 1.01], $\chi^2(1) = 0.055$, $p = .815$). Therefore, Hypothesis 2c was not supported.

[5] For readers of the marathon story, both the intensity, $r(42) = .403$, $p = .007$ (Holm-Bonferroni adjusted α–level = .025), and the number of emotional shifts were correlated with transportation as well, $r(42) = .309$, $p = .041$ (Holm-Bonferroni α–level = .05).

Next, we compared the two review conditions to test whether reading a negative review before reading the story decreased levels of transportation compared to reading a positive review, as postulated by Hypothesis 3a. Results from a univariate ANOVA showed that groups differed significantly in their levels of transportation, $F(1, 89) = 10.37$, $p = .002$, $\omega^2 = .09$, and that transportation was significantly lower for participants who read a negative review compared to a positive review (Table 4), supporting Hypothesis 3a.

Providing mixed support for Hypothesis 4a, we found that in the desertification story groups, transportation was positively related to affective-level attitudes towards Sahel people, $r(89) = .314$, $p = .002$, but not to cognitive-level attitudes towards agricultural techniques, $r(89) = .133$, $p = .210$. As postulated in Hypothesis 4b, transportation was substantially associated with social sharing intentions of the desertification story, $r(89) = .516$, $p < .001$. Regarding the predicted association between transportation and donations, odds for a higher donation for a story-related cause did not increase significantly with transportation (OR = 1.14, 95% CI [0.79; 1.66], $\chi^2(1) = 0.495$, $p = .482$ in the desertification story groups). Thus, Hypothesis 4c was not supported.

Finally, we tested whether transportation and the experience of emotional shifts mediated the relationship of reading a story with positive vs. negative reviews on story-consistent attitudes and social sharing intentions as predicted in Hypotheses 5a and 5b. We estimated six sequential mediation models using PROCESS v3.5 (Model 6, 5000 bootstrap samples) using the subsample that had read the desertification story. The review manipulation served as the independent variable (1 = positive review, 0 = negative review), transportation ($M1$) and number or intensity of emotional shifts ($M2$) served as mediators, and cognitive- or affective-level attitudes or social sharing intentions as the dependent variable. Results are reported in detail in Supplement S7. The total effect of the review treatment was not significant for any of the three outcome variables. Results show no indirect effect of the independent variable on cognitive-level attitudes. Transportation significantly mediated the

relationship of the review treatment and affective-level attitudes and social sharing intentions as indicated by the indirect effects. In addition, there was a significant indirect relationship of the review treatment and social sharing intentions through transportation and the intensity of emotional shifts (Figure 1). Therefore, results provide mixed support for Hypothesis 5a and Hypothesis 5b. Again, results of the mediation models provide an answer to our research question whether reviews affect emotional shifts irrespective of the indirect effect through transportation. As in Experiment 1, reviews did not directly affect the number or intensity of emotional shifts.

Hypothesis 5c predicted a mediation of the relationship of reviews and donations through transportation and emotional shifts. We computed another ordinal logistic regression using the positive (coded 1) vs. the negative (0) review group as independent and donations as dependent variables. However, the odds donating a higher amount in the positive review group did not differ significantly from the negative review group (OR = 0.71, 95% CI [0.33; 1.52], $\chi^2(1) = 0.792$, $p = .373$). Given the missing associations between donations and any of the mediators (see Hypothesis 2c and Hypothesis 4c) necessary for an indirect mediation, Hypothesis 5c was not supported either.

General Discussion

The experience of emotions is considered a key element to understanding narrative experience and narrative effects. This set of experiments provided one of the first empirical tests of predictions derived from Nabi and Green's (2015) emotional shifts framework by using a novel empirical approach, self-probed emotional retrospections.

In line with theory, two studies consistently show that transportation is positively associated with the experience of emotional shifts, as indicated by both their quantity and intensity. Moreover, emotional shift experiences are linked to social sharing intentions (recommending a story and talking about its contents with others both online and offline) as indicated by zero-order correlations and a two-step indirect effect that included transportation

as a more proximate mediator. This informs theory on post-exposure engagement, an important ingredient of the persuasion processes and media effects more generally (e.g., Slater et al., 2018; Southwell & Yzer, 2007; Thorson, 2014).

Consistent with previous research (e.g., Tukachinsky & Tokunaga, 2013), both studies provide further evidence that in a heightened state of transportation, endorsement of story-consistent attitudes becomes more likely. In Experiment 1, transportation was related to attitudes towards old-age romance, but not to attitudes towards old-age suicide, which may be less malleable for being tied to personal values or moral convictions (e.g., Skitka et al., 2005). In Experiment 2, the degree to which participants reported being transported was positively linked to affective but not cognitive-level attitudes. This finding is consistent with previous research suggesting that the persuasive potential of narratives pertains especially to the affective dimension of attitudes (Zebregs et al., 2015).

Assessing Emotional Shifts via Self-Probed Emotional Retrospections

With our studies, we refined and tested a continuous self-report measure of emotional experiences based on a method to examine memories by Larsen and Seilman (1988). Even though self-report measures are sometimes dismissed for only capturing the subjective feeling component of emotion that a subject is aware of, overall, they may be the best method currently available to assess emotional experiences efficiently and with the possibility to differentiate between discrete emotions (Barrett, 2016; Scherer, 2009). Assessing dynamic emotional responses to narratives via self-report comes with the challenge of minimizing interference with narrative processes, especially if these processes are also subject of interest in a study. For this reason, continuous response measures (e.g., affect rating dials) are usually limited to one or a maximum of two dimensions of emotion (Lang & Ewoldsen, 2011). However, this method is unable to capture shifts between discrete emotions of similar valence and arousal (e.g., anger and fear). The self-probed emotional retrospection method employed in this experimental series allows researchers to quantify emotional shifts based on different

discrete emotions. At the same time, in the manner of a cued-recall procedure, the „E"-markings participants make while reading the text function as reminders of an emotional experience that participants can later come back to. Thereby, some of the memory biases associated with retrospective self-reports of emotional states during multiple times of a story (Robinson & Clore, 2002) are mitigated (Mauss et al., 2005; McCall et al., 2015).

Furthermore, from the way we measured their emotional responses, it is highly improbable that participants inferred that we were interested in their experience of emotional shifts and the relationship of those shifts with transportation. Therefore, assessing emotional experiences this way minimizes the common-method bias that emerges when using the same type of measurement method for different constructs of interest (Podsakoff et al., 2003).

Validating a measure is a process that requires multiple studies and refinements of the procedure before it can be applied in different contexts. Taken together, the results from the pilot study and our two experiments provide some insight into the validity of the self-probed retrospection method and our emotional shifts indicators. The pilot study tested its practicability for a quantitative assessment of dynamic emotional responses while reading. Furthermore, it offers some evidence in support of the construct validity of self-probed emotional retrospections. We included need for affect to assess the sensitivity of the instrument to capture emotional experiences of varying intensity. As expected, individuals with a higher tendency to approach affective experiences also marked more „E"s in response to the story.

In the main studies, we employed two indicators for emotional shifts, both of which represent possible operationalizations of Nabi and Green's (2015) definition with evident content validity: One quantifies the number of times the emotion participants dominantly experienced changed from one to another during the narrative. The other captures the overall extent to which the intensities of all emotions reported varied throughout the story, whether or not a shift from one dominant emotion to another occurred. Applying two indicators to

quantify shifts helps to gain a better understanding of the qualities of emotional shifts that are crucial for narrative impact. Thereby this study informs theory and provides a starting point for future research on emotional processes during media reception.

The results of Experiment 1 and 2 further provide insights concerning the predictive validity of the emotional shift measures as indicated by their correlations with story-consistent outcome variables. The predictive validity of the intensity measure appears slightly superior to the number of shifts measure across both studies: whereas both indicators were associated with social sharing intentions in Experiment 2, only the intensity of shifts was associated with one attitude measure in Experiment 1. There are further questions to consider regarding the validation of self-probed emotional retrospections, e.g., whether this procedure and the emotional shift measures derived from it approximate to continuous response measures of emotion. However, previous research has demonstrated the criterion validity of different cued-recall procedures (e.g., Mauss et al., 2005), which suggests that similar results may be expected for self-probed emotional retrospections.

Limitations and Directions for Future Research

The aim of this research was to investigate the link between transportation, emotional shifts, and story-consistent outcomes. In our modelling of the narrative processes, we focused on the question how transportation may facilitate emotional shifts. This does not rule out the notion that emotional shifts stimulate transportation. It is important to note that our intention was not to argue for one perspective over the other. Instead, our research serves as one building block in understanding the relationship between emotional shifts and transportation, which is most likely bidirectional and should therefore be investigated from both perspectives.

The evolving and mutually reinforcing relationship between emotional shifts and transportation may best be scrutinized using continuous measures for both emotional shifts and transportation. In our studies, we measured emotional responses dynamically, whereas we used a global and static measure to capture transportation. We opted for this established and

validated scale because it is uncertain how transportation can be captured using a continuous self-report measure without interfering with self-probed emotional retrospections. Therefore, we prioritized our emotional shifts measure. However, the method we presented could be compatible with physiological process measures of transportation (e.g., skin conductance levels, Sukalla et al., 2015). There is evidence that recipients fluctuate from states of high to low transportation during a narrative (e.g., Bezdek & Gerrig, 2017). Combining process measures of transportation and emotional shifts is an important task for future research to disentangle the dynamics of emotional shifts and transportation over the course of a narrative with greater precision. Similarly, future research should investigate the link between emotional shifts and the different subcomponents of narrative engagement or transportation (e.g., attentional focus, presence, emotional engagement) to gain a more nuanced understanding of the mechanisms of narrative processing.

Furthermore, although the self-probed retrospection method is geared to written narratives, similar procedures may be adapted for audiovisual or auditive narratives (e.g., by recording time-stamps which are later revisited by participants to describe their emotional experience). Keene and Lang (2016) have shown that emotional valence has different implications for processing of visual and auditive information. Thus, effects of emotional shifts may vary with media modalities.

The narratives we used as stimulus materials were stories from different genres, which benefits the generalizability of our findings across messages. We chose narratives with a persuasive subtext, although they were not created with the primary purpose of persuasive communication (like health campaigns or advertising). Even so, narratives may shape attitudes no matter their persuasive intent. We deduced what could be perceived as the main take-away message from the story in an interpretative process. However, with the exception of one correlation marginally above the Holm-Bonferroni adjusted alpha (Experiment 1), our measures of emotional shifts were not associated with story-consistent attitudes. It is possible

that this association may manifest itself more clearly in stories that are primarily created for a persuasive purpose (e.g., health communication narratives). Furthermore, a recent study by Siegenthaler et al. (2021) shows that personal relevance of a message may be a prerequisite for observing persuasive effects of emotional shifts.

We explored the relationship of emotional shifts with story-consistent attitudes using two variables that measured shifts across the whole narrative in terms of their quantity and intensity, without taking into account the kind of emotions involved. Our goal was to apply a general measure that could easily be applied in other research contexts, independent of the particular story and without extensive coding effort. However, the self-probed emotional retrospection method enables researchers to examine more nuanced questions, such as the role of shifts between particular emotions relevant to the narrative or during key moments of the story (e.g., Appel, Schreiner et al., 2019), which may reveal different results with regards to persuasive outcomes. We encourage future studies to explore these questions to specify our understanding of the role emotional shifts play in narrative persuasion.

Finally, the theory predicts influences of emotional shifts not only during, but also before (during media selection) and after narrative exposure. We addressed the latter by including a measure for social sharing intentions in Experiment 2. However, we hope this manuscript inspires further empirical tests of the influences of emotional shifts before, during, and after story processing.

Conclusion

The increased scholarly attention to narrative processes in recent years calls for appropriate methodology to measure these processes. Most research in this domain relies on participants' self-reported retrospective accounts of their experiences that pertain to the narrative as a whole, which often does not live up to the dynamic nature of these experiences. The present research has overcome this limitation. Based on a novel *self-probed emotional retrospection task* we examined emotional shifts and their associations with transportation and

story-consistent attitudes. This experimental series advances our understanding of the role of emotional shifts as a mechanism of narrative persuasion. The *self-probed emotional retrospection task* was shown to be a viable methodological approach to study emotional experiences dynamically. We believe that it could play a key role at measuring emotions as they occur in future research.

Disclosure Statement

We have no known conflict of interest to disclose.

Data Availability Statement

The stimulus material underlying this article as well as the data and codes are available at https://osf.io/879gc/.

References

Appel, M., Gnambs, T., & Maio, G. (2012). A short measure of the need for affect. *Journal of Personality Assessment, 94*(4), 418–426. https://doi.org/10.1080/00223891.2012.666921

Appel, M., Gnambs, T., Richter, T., & Green, M. C. (2015). The transportation scale–short form (TS–SF). *Media Psychology, 18*(2), 243–266. https://doi.org/10.1080/15213269.2014.987400

Appel, M., & Richter, T. (2010). Transportation and need for affect in narrative persuasion: A mediated moderation model. *Media Psychology*, *13*(2), 101–135. https://doi.org/10.1080/15213261003799847

Appel, M., Schreiner, C., Haffmans, M. B., & Richter, T. (2019). The mediating role of event-congruent emotions in narrative persuasion. *Poetics*, *77*, Article 101385. https://doi.org/10.1016/j.poetic.2019.101385

Aristotle. (2001). *Rhetoric* (W. R. Robert, Trans.). The Internet Classics Archive. http://classics.mit.edu/Aristotle/rhetoric.1.i.html (Original work published 367–322 B.C.E.)

Barrett, L. F. (2016). Navigating the science of emotion. In H. L. Meiselmann (Ed.), *Emotion measurement* (pp. 31–63). Woodhead Publishing.

Bartsch, A. (2012) Emotional gratification in entertainment experience. Why viewers of movies and television series find it rewarding to experience emotions. *Media Psychology, 15*(3), 267–302. https://doi.org/10.1080/15213269.2012.693811

Bartsch, A., Appel, M. & Storch, T. (2010). Emotions and meta-emotions at the movies. The role of the need for affect. *Communication Research, 37 (2)*, 167–190. https://doi.org/10.1177/0093650209356441

Bezdek, M. A., & Gerrig, R. J. (2017). When narrative transportation narrows attention: Changes in attentional focus during suspenseful film viewing. *Media Psychology, 20*(1), 60–89. https://doi.org/10.1080/15213269.2015.1121830

Biocca, F., David, P., & West, M. (1994). Continuous response measurement (CRM): A computerized tool for research on the cognitive processing of communication messages. In A. Lang (Ed.), *Measuring psychological responses to media messages* (pp. 15–64). Erlbaum.

Bjarnason, B. (2011). *Dorsche haben traurige Augen. Geschichten aus Island. [Codfish have sad eyes. Stories from Iceland]*. Acabus.

Bordwell, D. (1985). *Narration in the fiction film.* University of Wisconsin Press.

Buhl, M. (2018, June 8). Bis zum Letzten [To the last]. *SZ-Magazin.* https://sz-magazin.sueddeutsche.de/sport/bis-zum-letzten-86932

Busselle, R., & Bilandzic, H. (2008). Fictionality and perceived realism in experiencing stories: A model of narrative comprehension and engagement. *Communication Theory, 18*(2), 255–280. https://doi.org/10.1111/j.1468-2885.2008.00322.x

Busselle, R., & Bilandzic, H. (2009). Measuring narrative engagement. *Media Psychology, 12*(4), 321–347. https://doi.org/10.1080/15213260903287259

Carrera, P., Caballero, A., & Muñoz, D. (2008). Comparing the effects of negative and mixed emotional messages on predicted occasional excessive drinking. *Substance Abuse: Research and Treatment, 1.* https://doi.org/10.1177/117822180800100001

Carrera, P., Muñoz, D., & Caballero, A. (2010). Mixed emotional appeals in emotional and danger control processes. *Health Communication, 25*(8), 726–736. https://doi.org/10.1080/10410236.2010.521914

Carroll, N. (1999). Film, emotion, and genre. In C. Plantinga & G. M. Smith (Eds.), *Passionate views: Film, cognition, and emotion* (pp. 21–47). The Johns Hopkins University Press.

Clayton, R. B., Raney, A. A., Oliver, M. B., Neumann, D., Janicke-Bowles, S. H., & Dale, K. R. (2019). Feeling transcendent? Measuring psychophysiological responses to self-transcendent media content. *Media Psychology.* https://doi.org/10.1080/15213269.2019.1700135

Cutting, J. E. (2016). Narrative theory and the dynamics of popular movies. *Psychonomic Bulletin & Review*, *23*(6), 1713–1743. https://doi.org/10.3758/s13423-016-1051-4

Eng, A. (2002). *Learning and processing non-fiction genre* [Unpublished doctoral dissertation]. University of Toronto.

Faul, F., Erdfelder, E., Buchner, A., & Lang, A. G. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods, 41*(4), 1149-1160. https://doi.org/10.3758/BRM.41.4.1149

Freytag, G. (1863). *Die Technik des Dramas [Technique of the drama]*. Hirzel.

Gerrig, R. J. (1993). *Experiencing narrative worlds. On the psychological activities of reading.* Yale University Press.

Green, M., Bilandzic, H., Fitzgerald, K., & Paravati, E. (2020). Narrative effects. In M. B. Oliver, A. A. Raney, & J. Bryant (Eds.), *Media effects: Advances in theory and research* (pp. 130–145). Routledge. https://doi.org/10.4324/9780429491146-9

Green, M. C., & Brock, T. C. (2000). The role of transportation in the persuasiveness of public narratives. *Journal of Personality and Social Psychology, 79*(5), 701–721. https://doi.org/10.1037/0022-3514.79.5.701

Hamby, A., & Brinberg, D. (2016). Happily ever after: How ending valence influences narrative persuasion in cautionary stories. *Journal of Advertising*, *45*(4), 498–508. https://doi.org/10.1080/00913367.2016.1262302

Hayes, A. F. (2018). *Introduction to mediation, moderation, and conditional process analysis. A regression based approach* (2nd ed.). Guilford Press.

Isberner, M.-B., Richter, T., Schreiner, C., Eisenbach, Y., Sommer, C., & Appel, M. (2018). Empowering stories: Transportation into narratives with strong protagonists increases self-related control beliefs. *Discourse Processes, 56*(8), 575–598. https://doi.org/10.1080/0163853X.2018.1526032

Jeska, A. (2012, November 29). Der Mann, der die Wüste aufhielt [The man who stopped the desert]. *Die Zeit.* https://www.zeit.de/2012/49/Hunger-Sahelzone-Baeumepflanzer

Keene, J. R., & Lang, A. (2016). Dynamic motivated processing of emotional trajectories in public service announcements. *Communication Monographs*, *83*(4), 468–485. https://doi.org/10.1080/03637751.2016.1198040

Koopman, E. M. (2016). Effects of "literaryness" on emotions and on empathy and reflection after reading. *Psychology of Aesthetics, Creativity, and the Arts, 10*(1), 82–98. http://dx.doi.org/10.1037/aca0000041

Kreibig, S. D. (2010). Autonomic nervous system activity in emotion: A review. *Biological Psychology*, *84*(3), 394–421. https://doi.org/10.1016/j.biopsycho.2010.03.010

Lang, A. & Ewoldsen, D. R. (2011). The measurement of positive and negative affect in media research. In K. Döveling, C. von Scheve, & E. A. Konijn (Eds.), *The Routledge handbook of emotions and mass media* (pp. 79–98). Routledge.

Larsen, S. F. & Seilman, U. (1988). Personal remindings while reading literature. *Text – Interdisciplinary Journal for the Study of Discourse, 8*(4), 411–430. https://doi.org/10.1515/text.1.1988.8.4.411

Maio, G. R. & Esses, V. M. (2001). The need for affect: Individual differences in the motivation to approach or avoid emotions. *Journal of Personality, 69*(4), 583–615. https://doi.org/10.1111/1467-6494.694156

Mar, R. A., Oatley, K., Djikic, M., & Mullin, J. (2011). Emotion and narrative fiction: Interactive influences before, during, and after reading. *Cognition & Emotion, 25*(5), 818–833. https://doi.org/10.1080/02699931.2010.515151

Mauss, I. B., Levenson, R. W., McCarter, L., Wilhelm, F. H., & Gross, J. J. (2005). The tie that binds? Coherence among emotion experience, behavior, and physiology. *Emotion, 5*(2), 175–190. https://doi.org/10.1037/1528-3542.5.2.175

Mauss, I. B., & Robinson, M. D. (2009). Measures of emotion: A review. *Cognition & Emotion*, *23*(2), 209–237. https://doi.org/10.1080/02699930802204677

McCall, C., Hildebrandt, L. K., Bornemann, B., & Singer, T. (2015). Physiophenomenology in retrospect: Memory reliably reflects physiological arousal during a prior threatening experience. *Consciousness and Cognition, 38*(1), 60–70. https://dx.doi.org/10.1016/j.concog.2015.09.011

Moyer-Gusé, E. (2008). Toward a theory of entertainment persuasion: Explaining the persuasive effects of entertainment-education messages. *Communication Theory, 18*, 407-425. https://doi.org/10.1111/j.1468-2885.2008.00328.x

Nabi, R. L. (2002). Discrete emotions and persuasion. In J. Price Dillard & M. Pfau (Eds.), *The persuasion handbook: Developments in theory and practice* (pp. 289–308). Sage. https://doi.org/10.4135/9781412976046.n15

Nabi, R. L. (2015). Emotional flow in persuasive health messages. *Health Communication*, *30*(2), 114–124. https://doi.org/10.1080/10410236.2014.974129

Nabi, R. L. & Green, M. C. (2015). The role of a narrative's emotional flow in promoting persuasive outcomes. *Media Psychology, 18*(2), 137–162. https://doi.org/10.1080/15213269.2014.912585

Oatley, K. (1994). A taxonomy of the emotions of literary response and a theory of identification in fictional narrative. *Poetics, 23*(1–2), 53–74. https://doi.org/10.1016/0304-422X(94)P4296-S

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88*(5), 879–903. https://doi.org/10.1037/0021-9010.88.5.879

Ratcliff, C. L. & Sun, Y. (2020). Overcoming resistance through narratives: Findings from a meta-analytic review. *Human Communication Research, 46*(4), 412–443. https://doi.org/10.1093/hcr/hqz017

Reagan, A. J., Mitchell, L., Kiley, D., Danforth, C. M., & Dodds, P. S. (2016). The emotional arcs of stories are dominated by six basic shapes. *EPJ Data Science*, *5*, Article 31. https://doi.org/10.1140/epjds/s13688-016-0093-1

Robinson, M. D., & Clore, G. L. (2002). Episodic and semantic knowledge in emotional self-report: Evidence for two judgment processes. *Journal of Personality and Social Psychology*, *83*(1), 198–215. https://doi.org/10.1037/0022-3514.83.1.198

Rossiter, J. R., & Percy, L. (1991). Emotions and motivations in advertising. *Advances in Consumer Research, 18*, 100–110. https://www.acrwebsite.org/volumes/7146/volumes/v18/NA-18

Rossiter, J. R., & Thornton, J. (2004). Fear-pattern analysis supports the fear-drive model for antispeeding road-safety TV ads. *Psychology & Marketing, 21*(11), 945–960. https://doi.org/10.1002/mar.20042

Sauder, D., & DeMars, C. E. (2019). An updated recommendation for multiple comparisons. *Advances in Methods and Practices in Psychological Science, 2*(1), 26–44. https://doi.org/10.1177/2515245918808784

Scherer, K. R. (2009). The dynamic architecture of emotion: Evidence for the component process model. *Cognition and Emotion, 23*(7), 1307–1351. https://doi.org/10.1080/02699930902928969

Segal, E. M. (1995). Narrative comprehension and the role of deictic shift theory. In J. F. Duchan, G. A. Bruder, & L. E. Hewitt (Eds.), *Deixis in narrative: A cognitive science perspective* (pp. 3–17). Psychology Press. https://doi.org/10.4324/9780203052907

Seilman, U., & Larsen, S. F. (1989). Personal resonance to literature: A study of remindings while reading. *Poetics*, *18*(1–2), 165–177. https://doi.org/10.1016/0304-422x(89)90027-2

Shedlosky-Shoemaker, R., Costabile, K. A., DeLuca, H. K., & Arkin, R. M. (2011). The social experience of entertainment media: Effects of others' evaluations on our experience. *Journal of Media Psychology: Theories, Methods, and Applications, 23(3)*, 111–121. https://doi.org/10.1027/1864-1105/a000042

Siegel, E. H., Sands, M. K., Van den Noortgate, W., Condon, P., Chang, Y., Dy, J., Quigley, K. S., & Barrett, L. F. (2018). Emotion fingerprints or emotion populations? A meta-analytic investigation of autonomic features of emotion categories. *Psychological Bulletin*, *144*(4), 343–393. https://doi.org/10.1037/bul0000128

Siegenthaler, P., Ort, A., & Fahr, A. (2021). The influence of valence shifts in fear appeals on message processing and behavioral intentions: A moderated mediation model. *PLoS ONE, 16*(9), e0255113. https://doi.org/10.1371/journal.pone.0255113

Skitka, L. J., Bauman, C. W., & Sargis, E. G. (2005). Moral conviction: Another contributor to attitude strength or something more? *Journal of Personality and Social Psychology*, *88*(6), 895–917. https://doi.org/10.1037/0022-3514.88.6.895

Slater, M. D., Ewoldsen, D. R., & Woods, K. W. (2018). Extending conceptualization and measurement of narrative engagement after-the-fact: Parasocial relationship and retrospective imaginative involvement. *Media Psychology, 21*(3), 329-351. https://doi.org/10.1080/15213269.2017.1328313

Slater, M.D., & Rouner, D. (2002). Entertainment-education and elaboration likelihood: Understanding the processing of narrative persuasion. *Communication Theory, 12,* 173-191. https://doi.org/10.1093/ct/12.2.173

Southwell, B. G. & Yzer, M. C. (2007). The roles of interpersonal communication in mass media campaigns. *Annals of the International Communication Association, 31*(1), 420–462. https://doi.org/10.1080/23808985.2007.11679072

Stieglitz, S., & Dang-Xuan, L. (2013). Emotions and information diffusion in social media – sentiment of microblogs and sharing behavior. *Journal of Management Information Systems, 29*(4), 217-247. https://doi.org/10.2753/MIS0742-1222290408

Sukalla, F., Bilandzic, H., Bolls, P. D., & Busselle, R. W. (2015). Embodiment of narrative engagement. Connecting self-reported narrative engagement to psychophysiological measures. *Journal of Media Psychology: Theories, Methods, and Applications, 28*(4), 175–186. https://doi.org/10.1027/1864-1105/a000153

Tan, E. S. (1996). *Emotion and the structure of narrative film: Film as an emotion machine*. Routledge.

Thorson, E. (2014). Beyond opinion leaders: how attempts to persuade foster political awareness and campaign learning. *Communication Research*, *41*(3), 353–374. https://doi.org/10.1177/0093650212443824

Tiede, K. E., & Appel, M. (2020). Reviews, expectations, and the experience of stories. *Media Psychology, 23*(3), 365–390. https://doi.org/10.1080/15213269.2019.1602055

Tukachinsky, R., & Tokunaga, R. (2013). The effects of engagement with entertainment. *Annals of the International Communication Association*, *37*(1), 287–322. https://doi.org/10.1080/23808985.2013.11679153

Van Laer, T., de Ruyter, K., Visconti, L. M., & Wetzels, M. (2014). The extended transportation-imagery model: A meta-analysis of the antecedents and consequences of consumers' narrative transportation. *Journal of Consumer Research, 40*(5), 797–817. https://doi.org/10.1086/673383

Walentynowicz, M., Schneider, S., & Stone, A. A. (2018). The effects of time frames on self-report. *PLoS ONE, 13*(8), Article e0201655. https://doi.org/10.1371/journal.pone.0201655

Zebregs, S., van den Putte, B., Neijens, P., & de Graaf, A. (2015). The differential impact of statistical and narrative evidence on beliefs, attitude, and intention: a meta-analysis. *Health Communication, 30*(3), 282–289. https://doi.org/10.1080/10410236.2013.842528

Zillmann, D. (1996). The psychology of suspense in dramatic exposition. In P. Vorderer, H. J. Wulff, & M. Friedrichsen (Eds.), *Suspense: Conceptualizations, theoretical analyses, and empirical explorations* (pp. 199–231). Erlbaum.

Zillmann, D. (2006). Dramaturgy for emotions from fictional narration. In J. Bryant & P. Vorderer (Eds.), *Psychology of entertainment* (pp. 215–238). Erlbaum.

Tables

Table 1

Zero-Order Correlations of the Continuous Variables (Experiment 1)

Variable	1	2	3	4	5
1. Transportation	-				
2. Number of emotional shifts	.324 (<.001)	-			
3. Intensity of emotional shifts	.448 (<.001)	.766 (<.001)	-		
4. Attitude towards old-age suicide	.035 (.698)	–.074 (.407)	.086 (.334)	-	
5. Attitude towards old-age romance	.345 (<.001)	.041 (.648)	.197 (.026)	.208 (.019)	-

Note. $N = 128$. Correlation p-values are shown in brackets.

Table 2

Descriptives, Post-Hoc Group Comparison p-*Values and Cohen's* d*s (Experiment 1).*

Measure	Negative Review (*n*=43)	Positive Review (*n*=42)	Control (*n*=43)	Negative vs. Positive		Negative vs. Control		Positive vs. Control	
	M (SD)	*M (SD)*	*M (SD)*	*p*	*d*	*p*	*d*	*p*	*d*
Transportation	4.77 (1.05)	5.03 (1.14)	5.44 (0.94)	.510	0.24	.007	0.67	.179	0.39
Number of emotional shifts	13.19 (4.95)	13.71 (3.47)	13.93 (3.77)	.836	0.12	.714	0.17	.959	0.06
Intensity of emotional shifts	154.58 (65.93)	183.62 (66.49)	176.84 (59.78)	.113	0.44	.235	0.35	.874	-0.11
Attitude towards old-age suicide	4.02 (1.13)	3.70 (1.22)	4.01 (1.15)	.425	-0.27	.997	-0.01	.472	0.26
Attitude towards old age romance	6.21 (0.73)	6.12 (0.75)	5.92 (0.57)	.863	-0.12	.110	-0.44	.345	-0.30

Note. N = 128. The Games-Howell post-hoc test was used to determine *p*-values.

Table 3

Zero-Order Correlations of the Continuous Variables (Experiment 2)

Variable	1	2	3	4	5	6
1. Transportation	-					
2. Number of emotional shifts	.222 (.035)	-				
3. Intensity of emotional shifts	.368 (<.001)	.769 (<.001)	-			
4. Cognitive-level attitudes (agriculture)	.133 (.210)	–.001 (.992)	–.028 (.792)	-		
5. Affective-level attitudes (Sahel people)	.314 (.002)	.128 (.228)	.203 (.054)	.076 (.474)	-	
6. Social sharing intentions	.516 (<.001)	.216 (.040)	.346 (<.001)	.001 (.993)	.482 (<.001)	-

Note. $n = 91$. Correlation p-values in brackets.

Table 4

Means, Standard Deviations, and Results of Analyses of Variance (Experiment 2)

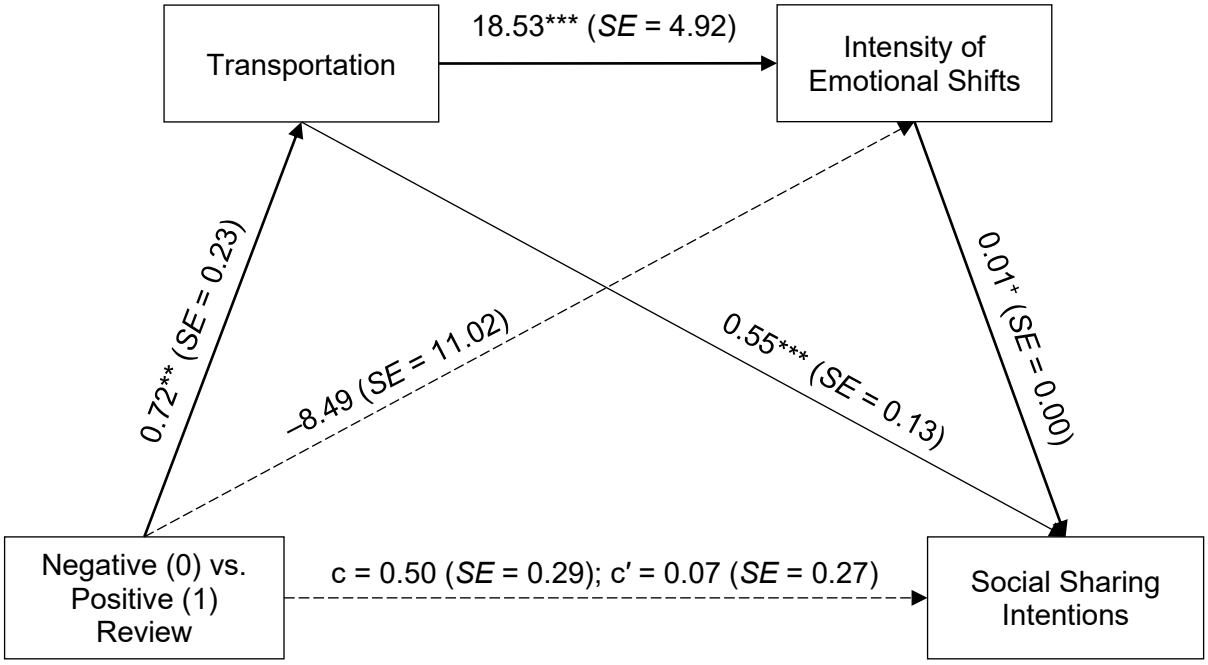
Measure	Negative Review (n = 48)	Positive Review (n = 43)			
	M (SD)	*M (SD)*	*F*(1, 89)	*p*	*d*
Transportation	4.40 (1.22)	5.12 (0.88)	10.37	.002	0.67
Number of emotional shifts	10.71 (3.40)	11.19 (2.71)	0.54	.464	0.16
Intensity of emotional shifts	146.19 (55.77)	151.12 (50.28)	0.19	.660	0.09
Cognitive-level attitudes (agriculture)	4.80 (1.44)	5.01 (1.29)	0.56	.458	0.15
Affective-level attitudes (Sahel people)	4.39 (0.98)	4.54 (1.07)	0.50	.480	0.15
Social sharing intentions	4.11 (1.42)	4.61 (1.38)	2.85	.095	0.36

Note. n = 91.

Figures

Figure 1

Sequential Mediation Model for the Effect of Negative Review Condition (X) on Social Sharing Intentions (Y) Through Transportation (M1) and the Intensity of Emotional Shifts (M2)



Note. Results for participants who read the desertification story (n = 91). Unstandardized regression coefficients are reported. Bold paths indicate significant sequential mediation. Non-significant paths are marked by dotted lines.

*** $p < .001$, ** $p < .01$, * $p < .05$, $^{+}p = .063$.

Online Supplement for

"The experience of emotional shifts in narrative persuasion"

S1 Review Manipulation (Pilot Study and Experiment 1)

Original German Version	English Translation
Positive Review	
Rezension der Hamburger Abendpost (20. Januar 2014)	*Review in the Hamburger Abendpost (January 20, 2014)*
Das Ende der Reise wurde von Brigitte Bjarnason geschrieben und spielt in einem isländischen Altersheim. Die Geschichte handelt von einem Liebesverhältnis, das aus konventionellen Gründen nicht geduldet wird. Wie bereits Shakespeares *Romeo und Julia* gezeigt hat, berührt die Thematik einer verbotenen Liebe viele Leserinnen und Leser gefühlsmäßig sehr. Zudem vermittelt Bjarnasons anschaulicher Schreibstil eine lebhafte Vorstellung der Ereignisse und da es bis zum Ende ungewiss ist, ob die beiden Verliebten eine gemeinsame Zukunft haben werden, bleibt es durchweg spannend. Fazit: Eine packende Geschichte, bei der man emotional mit den durchlebten Höhen und Tiefen der Protagonist(inn)en mitfiebert	*The End of the Journey* was written by Brigitte Bjarnason and takes place in a retirement home in Iceland. It tells the story of a love affair that is not tolerated for conventional reasons. As Shakespeare's *Romeo and Juliet* has already proven, forbidden love is a deeply moving topic for many readers. In addition, Bjarnason's vivid descriptions offer a lively imagination of the events. Suspense is sustained throughout the story, as it remains uncertain until the very end whether the couple will have a shared future. Bottom line: A gripping story that lets readers follow the emotional ups and downs of the protagonists.
Negative Review	
Rezension der Hamburger Abendpost (20. Januar 2014)	*Review in the Hamburger Abendpost (January 20, 2014)*
Das Ende der Reise wurde von Brigitte Bjarnason geschrieben und spielt in einem isländischen Altersheim. Die Geschichte handelt von einem	*The End of the Journey* was written by Brigitte Bjarnason and takes place in a retirement home in Iceland. It tells the story of a love affair that is not tolerated for

Liebesverhältnis, das aus konventionellen Gründen nicht geduldet wird. Wie bereits Shakespeares *Romeo und Julia* gezeigt hat, berührt die Thematik einer verbotenen Liebe viele Leserinnen und Leser gefühlsmäßig sehr. Dennoch schafft es *Das Ende der Reise* nicht, sich emotional auf die Handlung einzulassen. Ein nüchterner und eindimensionaler Schreibstil verharmlost die Tragik des thematisierten Konflikts und obwohl es bis zum Ende ungewiss ist, ob die beiden Verliebten eine gemeinsame Zukunft haben werden, kommt keine Spannung auf.

Fazit: Eine oberflächliche Geschichte, bei der jegliche Höhen und Tiefen fehlen

und es schwer fällt, bei der Sache zu bleiben.

conventional reasons. As Shakespeare's *Romeo and Juliet* has already proven, forbidden love is a deeply moving topic for many readers. However, *The End of the Journey* fails to let readers get involved emotionally with the story. The prosaic and one-dimensional style downplays the tragic nature of the conflict. Even though it remains uncertain until the very end whether the couple will have a shared future, the story lacks suspense.

Bottom line: A superficial story without any ups and downs that makes it hard to sustain the reader's attention.

S2 Attitude Measures (Pilot Study and Experiment 1)

Original German Version	English Translation
Attitude towards suicide in old age	
1. Im Alter sollte es die Möglichkeit geben, ohne große Widerstände Suizid begehen zu können.	1. It should be possible to end one's life in old age without any greater resistance.
2. Suizid ist oft ein sinnstiftender Abschluss des Lebens.	2. Suicide is often a meaningful end of life.
3. Es ist moralisch verwerflich, durch Suizid aus dem Leben zu scheiden.	3. It is morally reprehensible to commit suicide.
4. Suizid ist fast immer feige.	4. Suicide is almost always recreant.
5. Suizid im Alter ist eine natürliche Form des Abschieds.	5. Suicide in old age is a natural way of parting.
Attitude towards romantic love in retirement homes	
1. Romantische Partnerschaften im Alter sollten aktiv gefördert werden.	1. Romantic relationships in old age should be actively encouraged.
2. Altersheime sind nicht dazu da, einen Lebensgefährten zu finden.	2. Retirement homes are not a place to find a life partner.
3. Liebesbeziehungen in Altersheimen sind etwas Wundervolles, das aktiv gefördert werden sollte.	3. Romantic relationships in retirement homes are a wonderful thing that should be actively encouraged.
4. Der Austausch von Intimitäten hat in Altersheimen nichts verloren.	4. The exchange of intimacies has no place in retirement homes.
5. Alte Menschen, die ledig oder verwitwet sind, haben kein Bedürfnis nach einem Partner bzw. einer Partnerin.	5. Old people who are single or widowed do not have a need for a partner.

S3 Additional Results of the Pilot Study

Table S3a

Zero-Order Correlations of the Continuous Variables (Pilot Study)

Variable	1	2	3	4	5
1. Need for affect – approach tendency	-				
2. Need for affect – avoidance tend.	–.199 (.055)	-			
3. Transportation	.211 (.041)	.096 (.357)	-		
4. Number of „E“s	.230 (.025)	–.031 (.769)	.275 (.007)	-	
5. Attitude towards old-age suicide	–.035 (.736)	–.114 (.276)	–.023 (.824)	–.100 (.337)	-
6. Attitude towards old-age romance	.133 (.201)	–.008 (.942)	.137 (.189)	.085 (.415)	.043 (.681)

Note. N = 94. Correlation p-values are shown in brackets.

Table S3b

Descriptives, Post-Hoc Group Comparison p-*Values and Cohen's* d *(Pilot Study).*

Measure	Negative Review (*n*=31)	Positive Review (*n*=29)	Control (*n*=34)	Negative vs. Positive		Negative vs. Control		Positive vs. Control	
	M (SD)	*M (SD)*	*M (SD)*	*p*	*d*	*p*	*d*	*p*	*d*
Transportation	4.43 (1.05)	5.09 (0.95)	5.01 (1.07)	.032	0.66	.075	0.55	.944	-0.08
Number of „E“s	23.61 (13.21)	26.62 (16.47)	17.94 (7.85)	.719	0.20	.105	-0.53	.035	-0.69
Attitude towards old-age suicide	4.19 (1.31)	4.24 (1.09)	3.58 (1.21)	.984	0.04	.138	-0.49	.066	-0.57
Attitude towards old age romance	6.11 (1.13)	6.48 (0.44)	5.98 (0.83)	.226	0.43	.869	-0.13	.011	-0.74

Note. N = 94. The Games-Howell post-hoc test was used to determine *p*-values.

S4 Mediation Analyses (Experiment 1)

Table S4a

Sequential Mediation Model for the Effect of Reviews on Attitudes Towards Old-Age Suicide Through Transportation and the Number of Emotional Shifts

Variable	Effect	*SE*	95%CI LL	95%CI UL
Total Effects				
Neg. (0) vs. no rev. (1) → Att. suicide	–0.02	0.25	–0.52	0.48
Neg. (0) vs. pos. rev. (1) → Att. suicide	–0.32	0.25	–0.82	0.18
Paths				
Neg. (0) vs. no rev. (1) → Transp.	0.67	0.23	0.22	1.12
Neg. (0) vs. pos. rev. (1) → Transp.	0.26	0.23	–0.19	0.71
Neg. (0) vs. no rev. (1) → No. ES	–0.09	0.88	–1.83	1.64
Neg. (0) vs. pos. rev. (1) → No. ES	0.20	0.86	–1.56	1.89
Transp. → No. ES	1.25	0.34	0.58	1.91
Transp. → Att. suicide	0.07	0.11	–0.14	0.28
No. ES → Att. suicide	–0.03	0.03	–0.08	0.03
Indirect Effects				
Neg. (0) vs. no rev. (1) → Transp. → Att. Suicide	0.05	0.08	–0.09	0.23
Neg. (0) vs. pos. rev. (1) → Transp. → Att. Suicide	0.02	0.04	–0.05	0.14
Neg. (0) vs. no rev. (1) → No. ES → Att. Suicide	0.00	0.03	–0.07	0.08
Neg. (0) vs. pos. rev. (1) → No. ES → Att. Suicide	–0.00	0.03	–0.08	0.06
Neg. (0) vs. no rev. (1) → Transp. → No. ES → Att. suicide	–0.03	0.03	–0.09	0.02
Neg. (0) vs. pos. rev. (1) → Transp. → No. ES → Att. suicide	–0.01	0.02	–0.05	0.01
Direct Effects				
Neg. (0) vs. no rev. (1) → Att. suicide	–0.05	0.26	–0.56	0.47
Neg. (0) vs. pos. rev. (1) → Att. suicide	–0.33	0.26	–0.83	0.18

Note. Neg. rev. = negative review; Pos. rev. = positive review; No rev. = no review; Transp. = transportation; No. ES = number of emotional shifts; Att. suicide = attitudes towards old-age suicide. 5,000 bootstrap samples.

Table S4b

Sequential Mediation Model for the Effect of Reviews on Attitudes Towards Old-Age Suicide Through Transportation and the Intensity of Emotional Shifts

Variable	Effect	*SE*	95%CI LL	95%CI UL
Total Effects				
Neg. (0) vs. no rev. (1) → Att. suicide	–0.02	0.25	–0.52	0.48
Neg. (0) vs. pos. rev. (1) → Att. suicide	–0.32	0.25	–0.82	0.18
Paths				
Neg. (0) vs. no rev. (1) → Transp.	0.67	0.23	0.22	1.12
Neg. (0) vs. pos. rev. (1) → Transp.	0.26	0.23	–0.19	0.71
Neg. (0) vs. no rev. (1) → Intensity ES	4.26	12.91	–21.30	29.82
Neg. (0) vs. pos. rev. (1) → Intensity ES	21.94	12.62	–3.04	46.93
Transp. → Intensity ES	26.84	4.94	17.06	36.62
Transp. → Att. suicide	–0.18	0.11	–0.24	0.20
Intensity ES → Att. suicide	0.00	0.00	–0.00	0.01
Indirect Effects				
Neg. (0) vs. no rev. (1) → Transp. → Att. Suicide	–0.01	0.08	–0.16	0.17
Neg. (0) vs. pos. rev. (1) → Transp. → Att. Suicide	–0.01	0.04	–0.09	0.09
Neg. (0) vs. no rev. (1) → Intensity ES → Att. suicide	0.01	0.04	–0.06	0.11
Neg. (0) vs. pos. rev. (1) → Intensity ES → Att. suicide	0.05	0.06	–0.04	0.19
Neg. (0) vs. no rev. (1) → Transp. → Intensity ES → Att. suicide	0.04	0.04	–0.03	0.12
Neg. (0) vs. pos. rev. (1) → Transp. → Intensity ES → Att. suicide	0.02	0.02	–0.02	0.06
Direct Effects				
Neg. (0) vs. no rev. (1) → Att. suicide	–0.05	0.26	–0.57	0.46
Neg. (0) vs. pos. rev. (1) → Att. suicide	–0.38	0.26	–0.89	0.14

Note. Neg. rev. = negative review; Pos. rev. = positive review; No rev. = no review; Transp. = transportation; Intensity ES = intensity of emotional shifts; Att. suicide = attitudes towards old-age suicide. 5,000 bootstrap samples.

Table S4c

Sequential Mediation Model for the Effect of Reviews on Attitudes Towards Old-Age Romance Through Transportation and the Number of Emotional Shifts

Variable	Effect	*SE*	95%CI LL	95%CI UL
Total Effects				
Neg. (0) vs. no rev. (1) → Att. romance	–0.29	0.15	–0.58	0.01
Neg. (0) vs. pos. rev. (1) → Att. romance	–0.08	0.15	–0.38	0.21
Paths				
Neg. (0) vs. no rev. (1) → Transp.	0.67	0.23	0.22	1.12
Neg. (0) vs. pos. rev. (1) → Transp.	0.26	0.23	–0.19	0.71
Neg. (0) vs. no rev. (1) → No. ES	–0.09	0.88	–1.83	1.64
Neg. (0) vs. pos. rev. (1) → No. ES	0.20	0.86	–1.56	1.89
Transp. → No. ES	1.25	0.34	0.58	1.91
Transp. → Att. romance	0.29	0.06	0.17	0.40
No. ES → Att. romance	–0.01	0.01	–0.04	0.01
Indirect Effects				
Neg. (0) vs. no rev. (1) → Transp. → Att. Romance	0.19	0.08	0.07	0.37
Neg. (0) vs. pos. rev. (1) → Transp. → Att. Romance	0.08	0.07	–0.06	0.24
Neg. (0) vs. no rev. (1) → No. ES → Att. Romance	–0.00	0.02	–0.05	0.03
Neg. (0) vs. pos. rev. (1) → No. ES → Att. Romance	0.00	0.02	–0.04	0.03
Neg. (0) vs. no rev. (1) → Transp. → No. ES → Att. romance	–0.01	0.01	–0.04	0.01
Neg. (0) vs. pos. rev. (1) → Transp. → No. ES → Att. romance	–0.01	0.01	–0.02	0.01
Direct Effects				
Neg. (0) vs. no rev. (1) → Att. romance	–0.47	0.14	–0.75	–0.19
Neg. (0) vs. pos. rev. (1) → Att. romance	–0.15	0.14	–0.42	0.12

Note. Neg. rev. = negative review; Pos. rev. = positive review; No rev. = no review; Transp. = transportation; No. ES = number of emotional shifts; Att. romance = attitudes towards old-age romance. 5,000 bootstrap samples.

Table S4d

Sequential Mediation Model for the Effect of Reviews on Attitudes Towards Old-Age Romance Through Transportation and the Intensity of Emotional Shifts

Variable	Effect	*SE*	95%CI LL	95%CI UL
Total Effects				
Neg. (0) vs. no rev. (1) → Att. romance	–0.29	0.15	–0.58	0.01
Neg. (0) vs. pos. rev. (1) → Att. romance	–0.08	0.15	–0.38	0.21
Paths				
Neg. (0) vs. no rev. (1) → Transp.	0.67	0.23	0.22	1.12
Neg. (0) vs. pos. rev. (1) → Transp.	0.26	0.23	–0.19	0.71
Neg. (0) vs. no rev. (1) → Intensity ES	4.26	12.91	–21.30	29.82
Neg. (0) vs. pos. rev. (1) → Intensity ES	21.94	12.62	–3.04	46.93
Transp. → Intensity ES	26.84	4.94	17.06	36.62
Transp. → Att. romance	0.25	0.06	0.14	0.37
Intensity ES → Att. romance	0.00	0.00	–0.00	0.00
Indirect Effects				
Neg. (0) vs. no rev. (1) → Transp. → Att. Romance	0.17	0.07	0.06	0.32
Neg. (0) vs. pos. rev. (1) → Transp. → Att. Romance	0.07	0.07	–0.05	0.21
Neg. (0) vs. no rev. (1) → Intensity ES → Att. romance	0.00	0.02	–0.03	0.04
Neg. (0) vs. pos. rev. (1) → Intensity ES → Att. romance	0.01	0.03	–0.04	0.08
Neg. (0) vs. no rev. (1) → Transp. → Intensity ES → Att. romance	0.01	0.02	–0.03	0.06
Neg. (0) vs. pos. rev. (1) → Transp. → Intensity ES → Att. romance	0.00	0.01	–0.01	0.03
Direct Effects				
Neg. (0) vs. no rev. (1) → Att. romance	–0.47	0.14	–0.75	–0.19
Neg. (0) vs. pos. rev. (1) → Att. romance	–0.17	0.14	–0.44	0.11

Note. Neg. rev. = negative review; Pos. rev. = positive review; No rev. = no review; Transp. = transportation; Intensity ES = intensity of emotional shifts; Att. romance = attitudes towards old-age romance. 5,000 bootstrap samples.

S5 Review Manipulation (Experiment 2)

Original German Version	English Translation
Positive Review	
Auf den folgenden Seiten lesen Sie den Text „Der Mann, der die Wüste aufhielt“ von Petra Reimann. Bitte lesen Sie zunächst folgende Hintergrundinformationen zu dem Text durch:	*On the following pages you will read the text „The man who stopped the desert” by Petra Reimann. Please start by reading the following background information about the text:*
Der Text erschien in einer renommierten überregionalen Wochenzeitung. Er basiert auf gründlicher und jahrelanger Recherche der Autorin. Erzählt wird die Geschichte eines Mannes, Yacouba Sawadogo, der mehrere Hektar Wald inmitten der unwirtlichen Sahelzone pflanzte. Der Autorin ist insgesamt eine stimmige und berührende Schilderung gelungen. Die vielschichtig gezeichneten Figuren erlauben es, die menschliche Dimension der Thematik in ihrer Tiefe zu begreifen. Die Sprache ist einfühlsam und dabei doch stets professionell. Durch das handwerkliche Geschick der Autorin gelingt es, ein wichtiges Thema anschaulich zu vermitteln und der Text erlaubt es, die Geschichte zu erleben, als wäre man selbst dabei. Für Ihre herausragende journalistische Leistung wurde die Autorin mit dem Theodor-Wolff-Preis ausgezeichnet.	The text was published in a renowned national weekly. It is based on years of thorough research by the author. It tells the story of a man, Yacouba Sawadogo, who planted multiple hectares of forest amidst the inhospitable Sahel region. Overall, the author succeeds in telling a convincing and moving story. The multifaceted characters allow to profoundly grasp the human dimension of the issue. The language is empathetic and yet professional throughout. The author conveys an important topic vividly by use of her craftsmanship and lets readers experience the story as if they were part of it themselves. The author was honored with the Theodor-Wolff-Award for her extraordinary journalistic performance.

Negative Review

Auf den folgenden Seiten lesen Sie den Text „Der Mann, der die Wüste aufhielt“ von Petra Reimann. Bitte lesen Sie zunächst folgende Hintergrundinformationen zu dem Text durch:

Der Text wurde im Rahmen der Ausbildung der Autorin an der Journalistenschule Oldenburg verfasst. Er basiert auf Originalreportagen anderer Journalisten. Erzählt wird die Geschichte eines Mannes, Yacouba Sawadogo, der mehrere Hektar Wald inmitten der unwirtlichen Sahelzone pflanzte. Die Präsentation der Geschichte ist insgesamt lückenhaft und holprig, die Beschreibung der Figuren im Text zu eindimensional. Zudem bleibt die Rolle einiger Figuren, wie etwa die des Scheichs zu Beginn, im Verlauf unklar.

Die Sprache ist zuweilen weniger journalistisch denn pathetisch. Der Erzählstil schafft aufgrund der handwerklichen Fehler unnötige Distanz zum Thema und erlaubt es nicht, die Geschichte zu erleben, als wäre man selbst dabei.

Der Text erhielt auf der Journalistenschule Oldenburg als Seminararbeit die Note befriedigend bis ausreichend (3,3).

On the following pages you will read the text „The man who stopped the desert” by Petra Reimann. Please start by reading the following background information about the text:

The text was written for an assignment of the author’s studies at the journalism school of Oldenburg. It is based on original reports of other journalists. It tells the story of a man, Yacouba Sawadogo, who planted multiple hectares of forest amidst the inhospitable Sahel region. The overall presentation of the story is fragmentary and clumsy, the description of the characters too one-dimensional. Furthermore, the role of some of the characters (e.g., the Sheikh at the beginning), remains unresolved as the story unfolds.

The language is at times melodramatic rather than journalistic. Due to the author’s sloppy style and craftsmanship, unnecessary distance towards the topic is created, which prevents readers from experiencing the story as if they were part of it themselves.

The assignment at the journalism school of Oldenburg was graded satisfactory/acceptable (C-).

S6 Dependent Measures (Experiment 2)

Original German Version	English Translation
Cognitive-level attitudes: Perceived appropriateness of European agricultural standards in African context	
1. Um den Hunger in Afrika zu bekämpfen, sollte der Einsatz bewährter europäischer Technologien vorangetrieben werden.	1. To combat hunger in Africa, the use of proved European technologies should be advanced.
2. Die landwirtschaftlichen Methoden der europäischen Industrienationen würden auch in Afrika Erfolg versprechen.	2. The agricultural methods of European industrial nations would also promise success in Africa.
3. Lösungen zur Steigerung des landwirtschaftlichen Ertrages in Afrika müssen von den europäischen Industrienationen kommen.	3. Solutions to improve harvests in Africa have to come from European industrial nations.
4. Die europäischen Standards der Landwirtschaft können als Vorbild für afrikanische Landwirtschaft dienen.	4. European standards of agriculture can serve as a model for African agriculture.
Affective-level attitudes: Emotional involvement with people of the Sahel region	
1. Das Schicksal der Menschen in der Sahelzone geht mir nahe.	1. The fate of the people living in the Sahel region affects me deeply.
2. Die Menschen in der Sahelzone liegen mir am Herzen.	2. The people living in the Sahel region are near and dear to me.
3. Ich fühle mich den Menschen in der Sahelzone verbunden.	3. I feel close to the people living in the Sahel region.
4. Die Zukunft der Sahelzone interessiert mich nicht besonders. (reversed)	4. I do not care about the future of the Sahel region. (reversed)
Social sharing intentions	
1. Ich würde diese Geschichte in Sozialen Medien (z.B. Facebook, Twitter) teilen.	1. I would share this story on social media (e.g., Facebook, Twitter).
2. Ich würde diese Geschichte in Sozialen Medien (z.B. Facebook, Twitter) liken.	2. I would „like“ this story on social media (e.g., Facebook, Twitter).
3. Ich würde Freunden, Bekannten oder Familienmitgliedern von dieser Geschichte erzählen.	3. I would tell friends, acquaintances, or family members about this story.

4. Ich würde die Geschichte Freunden, Bekannten oder Familienmitgliedern zum Lesen empfehlen.	4. I would recommend this story to friends, acquaintances, or family members for reading.
5. Ich würde mit Freunden, Bekannten oder Familienmitgliedern über die Themen, die in der Geschichte berührt werden, reden.	5. I would discuss the issues addressed in the story with friends, acquaintances, or family members.

Background information for the donation (behavioral measure)

Für Ihre Teilnahme erhalten Sie eine Vergütung von 12€. Sie haben die Möglichkeit, einen beliebigen Anteil davon an die Organisation Terra-Verde e.V. zu spenden. Die Spende ist freiwillig.	You will receive 12€ for your participation in this study. You have the option to donate any given amount of your compensation to the organization Terra-Verde e.V. The donation is voluntary.
Das Ziel von Terra Verde ist es, die Desertifikation (Verwüstung) in Burkina Faso zu stoppen oder sogar umzukehren. Dazu werden Natursteine zu Wällen geschichtet. Diese Steinwälle sind notwendig, um das Regenwasser in der trockenen Sahelzone besser zu nutzen und den Boden vor Erosion zu schützen. Ohne den Bau von Steinwällen wird der fruchtbare Teil des Bodens vom Regenwasser weggespült.	The goal of Terra Verde is to stop or to even reverse desertification in Burkina Faso. For this purpose, rocks are piled up to stone walls. These walls help to make better use of the rainwater in the dry Sahel region and to protect the soil from erosion. Without these walls the fertile parts of the soil are washed away by the rainwater.

S7 Mediation Analyses (Experiment 2)

Table S7a

Sequential Mediation Model for the Effect of Reviews on Attitudes Towards Agricultural Techniques Through Transportation and the Number of Emotional Shifts

Variable	Effect	SE	95%CI LL	95%CI UL
Total Effects				
Neg. (0) vs. pos. rev. (1) → Att. agricult.	0.22	0.29	–0.36	0.79
Paths				
Neg. (0) vs. pos. rev. (1) → Transp.	0.72	0.23	0.28	1.17
Neg. (0) vs. pos. rev. (1) → No. ES	0.04	0.68	–1.30	1.38
Transp. → No. ES	0.60	0.30	0.00	1.20
Transp. → Att. agricult.	0.15	0.14	–0.12	0.43
No. ES → Att. agricult.	–0.01	0.05	–0.11	0.08
Indirect Effects				
Neg. (0) vs. pos. rev. (1) → Transp. → Att. agricult.	0.11	0.13	–0.10	0.43
Neg. (0) vs. pos. rev. (1) → No. ES → Att. agricult.	–0.00	0.03	–0.07	0.06
Neg. (0) vs. pos. rev. (1) → Transp. → No. ES → Att. agricult.	–0.01	0.03	–0.06	0.04
Direct Effects				
Neg. (0) vs. pos. rev. (1) → Att. agricult.	0.11	0.31	–0.50	0.72

Note. Neg. rev. = negative review; Pos. rev. = positive review; Transp. = transportation; No. ES = number of emotional shifts; Att. agricult. = cognitive-level attitudes towards agricultural techniques. 5,000 bootstrap samples.

Table S7b

Sequential Mediation Model for the Effect of Reviews on Attitudes Towards Agricultural Techniques Through Transportation and the Intensity of Emotional Shifts

Variable	Effect	SE	95%CI LL	95%CI UL
Total Effects				
Neg. (0) vs. pos. rev. (1) → Att. agricult.	0.22	0.29	–0.36	0.79
Paths				
Neg. (0) vs. pos. rev. (1) → Transp.	0.72	0.23	0.28	1.17
Neg. (0) vs. pos. rev. (1) → Intensity ES	–8.49	11.02	–30.40	13.42
Transp. → Intensity ES	18.53	4.92	8.76	28.30
Transp. → Att. agricult.	0.19	0.15	–0.11	0.48
Intensity ES → Att. agricult.	–0.00	0.00	–0.01	0.00
Indirect Effects				
Neg. (0) vs. pos. rev. (1) → Transp. → Att. agricult.	0.14	0.14	–0.06	0.46
Neg. (0) vs. pos. rev. (1) → Intensity ES → Att. agricult.	0.02	0.05	–0.04	0.17
Neg. (0) vs. pos. rev. (1) → Transp. → Intensity ES → Att. agricult.	–0.03	0.04	–0.13	0.04
Direct Effects				
Neg. (0) vs. pos. rev. (1) → Att. agricult.	0.09	0.31	–0.52	0.70

Note. Neg. rev. = negative review; Pos. rev. = positive review; Transp. = transportation; Intensity ES = intensity of emotional shifts; Att. agricult. = cognitive-level attitudes towards agricultural techniques. 5,000 bootstrap samples.

Table S7c

Sequential Mediation Model for the Effect of Reviews on Attitudes Towards Sahel People Through Transportation and the Number of Emotional Shifts

Variable	Effect	SE	95%CI LL	95%CI UL
Total Effects				
Neg. (0) vs. pos. rev. (1) → Att. Sahel people	0.15	0.22	–0.27	0.58
Paths				
Neg. (0) vs. pos. rev. (1) → Transp.	0.72	0.23	0.28	1.17
Neg. (0) vs. pos. rev. (1) → No. ES	0.04	0.68	–1.30	1.38
Transp. → No. ES	0.60	0.30	0.00	1.20
Transp. → Att. Sahel people	0.28	0.10	0.08	0.48
No. ES → Att. Sahel people	0.02	0.03	–0.05	0.09
Indirect Effects				
Neg. (0) vs. pos. rev. (1) → Transp. → Att. Sahel people	0.20	.010	0.04	0.43
Neg. (0) vs. pos. rev. (1) → No. ES → Att. Sahel people	–0.00	0.02	–0.05	0.05
Neg. (0) vs. pos. rev. (1) → Transp. → No. ES → Att. Sahel people	0.01	0.02	–0.02	0.05
Direct Effects				
Neg. (0) vs. pos. rev. (1) → Att. Sahel people	–0.06	0.22	–0.50	0.37

Note. Neg. rev. = negative review; Pos. rev. = positive review; Transp. = transportation; No. ES = number of emotional shifts; Att. Sahel people = affective-level attitudes towards Sahel people. 5,000 bootstrap samples.

Table S7d

Sequential Mediation Model for the Effect of Reviews on Attitudes Towards Sahel People Through Transportation and the Intensity of Emotional Shifts

Variable	Effect	SE	95%CI LL	95%CI UL
Total Effects				
Neg. (0) vs. pos. rev. (1) → Att. Sahel people	0.15	0.22	–0.27	0.58
Paths				
Neg. (0) vs. pos. rev. (1) → Transp.	0.72	0.23	0.28	1.17
Neg. (0) vs. pos. rev. (1) → Intensity ES	–8.49	11.02	–30.40	13.42
Transp. → Intensity ES	18.53	4.92	8.76	28.30
Transp. → Att. Sahel people	0.28	0.10	0.08	0.48
Intensity ES → Att. Sahel people	0.00	0.00	–0.00	0.00
Indirect Effects				
Neg. (0) vs. pos. rev. (1) → Transp. → Att. Sahel people	0.19	0.10	0.02	0.40
Neg. (0) vs. pos. rev. (1) → Intensity ES → Att. Sahel people	–0.12	0.03	–0.10	0.04
Neg. (0) vs. pos. rev. (1) → Transp. → Intensity ES → Att. Sahel people	0.03	0.03	–0.02	0.10
Direct Effects				
Neg. (0) vs. pos. rev. (1) → Att. Sahel people	–0.04	0.22	–0.48	0.39

Note. Neg. rev. = negative review; Pos. rev. = positive review; Transp. = transportation; Intensity ES = intensity of emotional shifts; Att. Sahel people = affective-level attitudes towards Sahel people. 5,000 bootstrap samples.

Table S7e

Sequential Mediation Model for the Effect of Reviews on Social Sharing Intentions Through Transportation and the Number of Emotional Shifts

Variable	Effect	SE	95%CI LL	95%CI UL
	Total Effects			
Neg. (0) vs. pos. rev. (1) → Sharing	0.50	0.29	–0.09	1.08
	Paths			
Neg. (0) vs. pos. rev. (1) → Transp.	0.72	0.23	0.28	1.17
Neg. (0) vs. pos. rev. (1) → No. ES	0.04	0.68	–1.30	1.38
Transp. → No. ES	0.60	0.30	0.00	1.20
Transp. → Sharing	0.62	0.12	0.37	0.86
No. ES → Sharing	0.06	0.04	–0.04	0.13
	Indirect Effects			
Neg. (0) vs. pos. rev. (1) → Transp. → Sharing	0.45	0.17	0.17	0.81
Neg. (0) vs. pos. rev. (1) → No. ES → Sharing	0.00	0.04	–0.09	0.09
Neg. (0) vs. pos. rev. (1) → Transp. → No. ES → Sharing	0.02	0.03	–0.01	0.09
	Direct Effects			
Neg. (0) vs. pos. rev. (1) → Sharing	0.03	0.27	–0.51	0.57

Note. Neg. rev. = negative review; Pos. rev. = positive review; Transp. = transportation; No. ES = number of emotional shifts; Sharing = social sharing intentions. 5,000 bootstrap samples.

Table S7f

Sequential Mediation Model for the Effect of Reviews on Social Sharing Intentions Through Transportation and the Intensity of Emotional Shifts

Variable	Effect	SE	95%CI LL	95%CI UL
	Total Effects			
Neg. (0) vs. pos. rev. (1) → Sharing	0.50	0.29	–0.09	1.08
	Paths			
Neg. (0) vs. pos. rev. (1) → Transp.	0.72	0.23	0.28	1.17
Neg. (0) vs. pos. rev. (1) → Intensity ES	–8.49	11.02	–30.40	13.42
Transp. → Intensity ES	18.53	4.92	8.76	28.30
Transp. → Sharing	0.61	0.12	0.36	0.85
Intensity ES → Sharing	0.01	0.00	–0.00	0.01
	Indirect Effects			
Neg. (0) vs. pos. rev. (1) → Transp. → Sharing	0.40	0.16	0.14	0.75
Neg. (0) vs. pos. rev. (1) → Intensity ES → Sharing	–0.04	0.06	–0.19	0.06
Neg. (0) vs. pos. rev. (1) → Transp. → Intensity ES → Sharing	0.07	0.04	0.00	0.17
	Direct Effects			
Neg. (0) vs. pos. rev. (1) → Sharing	0.07	0.27	–0.46	0.61

Note. Neg. rev. = negative review; Pos. rev. = positive review; Transp. = transportation; Intensity ES = intensity of emotional shifts; Sharing = social sharing intentions. 5,000 bootstrap samples.

S8 Additional Analyses for the Marathon Story (Experiment 2)

In Experiment 2, one group read a story about marathon runners that was irrelevant to the dependent variables in order to test the persuasive effects of the desertification story. We conducted univariate ANOVAs using cognitive- and affective-level attitudes and social sharing intentions as dependent variables. Results indicated significant differences between groups regarding both cognitive- as well as affective-level attitudes, $F(2, 132) = 9.77$, $p < .001$, $\omega^2 = .12$ and $F(2, 132) = 3.90$, $p = .023$, $\omega^2 = .05$, respectively. Games-Howell post-hoc analyses (see Table S8) revealed that cognitive-level attitudes significantly improved upon reading the desertification story compared to the marathon story in both review conditions. Compared to the marathon story group, affective-level attitudes were significantly higher in the positive but not the negative review group. Thus, the desertification story was persuasive compared to the attitude-irrelevant marathon story, at least when introduced by a positive review. We further checked whether donations for a story-related charity differed between readers of the desertification and the marathon story. Because this variable was not distributed normally, we created a new ordinal variable based on the frequency distribution of the amount donated (€0, €1-2, €4-7, €10-12, other values did not occur). Results of an ordinal logistic regression show that the odds donating a higher amount did not differ significantly from the marathon story group in neither the positive review condition ($OR = 1.09$, 95% CI [0.50; 2.36], $\chi^2(1) = 0.049$, $p = .826$), nor the negative review condition ($OR = 0.77$, 95% CI [0.36; 1.64], $\chi^2(1) = 0.467$, $p = .494$).

For zero-order correlations of the continuous measures in the marathon story group, see Table S9c.

Table S8

Descriptives, Post-Hoc Group Comparison p-*Values and Cohen's* d *(Experiment 2)*

Measure	Negative Review (n = 48)	Positive Review (n = 43)	Control (n = 44)	Negative vs. Positive		Negative vs. Control		Positive vs. Control	
	M (SD)	*M (SD)*	*M (SD)*	*p*	*d*	*p*	*d*	*p*	*d*
Transportation	4.40 (1.22)	5.12 (0.88)	5.00 (1.02)	.004	0.67	.029	0.53	.837	-0.13
Number of emotional shifts	10.71 (3.40)	11.19 (2.71)	11.04 (3.28)	.737	0.16	.879	0.10	.974	-0.05
Intensity of emotional shifts	146.19 (55.77)	151.12 (50.28)	125.75 (47.37)	.897	0.09	.145	-0.39	.046	-0.52
Cognitive-level attitudes (agriculture)	4.80 (1.44)	5.01 (1.29)	3.85 (1.17)	.734	0.15	.002	-0.72	<.001	-0.94
Affective-level attitudes (Sahel people)	4.39 (0.98)	4.54 (1.07)	3.93 (1.16)	.761	0.15	.107	-0.43	.033	-0.55
Social sharing intentions	4.11 (1.42)	4.61 (1.38)	3.79 (1.50)	.214	0.36	.554	-0.22	.027	-0.57

Note. N = 135. The Games-Howell post-hoc test was used to determine p-values.

S9 Need for Affect and Additional Zero-Order Correlations

Because the need for affect is known to affect transportation (Appel & Richter, 2010), we ran a MANOVA in all three datasets using the two subscales as dependent variables to determine if this trait was distributed equally across conditions. Using Wilk's λ, we found a significant main effect of the experimental group in the pilot study, $F(4, 180) = 3.58$, $p = .008$, $\omega^2_{mult} = .05$. Follow-up univariate analyses show significant differences between groups with regards to the avoidance tendency dimension of need for affect, $F(2, 91) = 5.85$, $p = .004$, $\omega^2 = .09$. Post-hoc group comparisons using the Games-Howell test reveal that the control condition had a significantly higher avoidance tendency ($M = 3.11$, $SD = 1.13$) than the negative review group ($M = 2.25$, $SD = 0.79$), $p = .002$, $d = 0.88$. We found no significant group differences with respect to the approach tendency subscale, $F(2, 91) = 1.99$, $p = .142$, $\omega^2 = .02$. We found no significant differences between groups in Experiment 1, $F(4, 248) = 0.83$, $p = .509$, $\omega^2_{mult} = .00$. The same applies to Experiment 2, $F(4, 262) = 0.73$, $p = .571$, $\omega^2_{mult} = .01$.

Table S9a.

Means, Standard Deviations, and Cronbach's Alpha of the Need for Affect Subscales

Variable	*M*	*SD*	Cronbach's α
Pilot Study (*N* = 94)			
NfA – Avoidance	2.69	1.06	.79
NfA - Approach	5.32	0.82	.69
Experiment 1 (*N* = 128)			
NfA – Avoidance	2.94	1.01	.73
NfA - Approach	5.33	0.74	.60
Experiment 2 (*N* = 135)			
NfA – Avoidance	2.96	1.14	.79
NfA - Approach	5.27	0.86	.63

Table S9b.

Zero-Order Correlations of Continuous Variables (Experiment 1)

Variable	1	2	3	4	5	6
1. Transportation	-					
2. Number of emotional shifts	.324 (<.001)	-				
3. Intensity of emotional shifts	.448 (<.001)	.766 (<.001)	-			
4. Attitude towards old-age suicide	.035 (.698)	–.074 (.407)	.086 (.334)	-		
5. Attitude towards old-age romance	.345 (<.001)	.041 (.648)	.197 (.026)	.208 (.019)	-	
6. NfA - Approach	.442 (<.001)	.122 (.171)	.247 (.005)	–.018 (.843)	.446 (<.001)	-
7. NfA - Avoidance	–.334 (<.001)	.025 (.775)	–.016 (.855)	.104 (.242)	–.210 (.017)	–.312 (<.001)

Note. N = 128. Correlation p-values are shown in brackets.

Table S9c.

Zero-Order Correlations of Continuous Variables (Experiment 2).

	1	2	3	4	5	6	7	8
1. Transportation	-	.309 (.041)	.403 (.007)	–.149 (.333)	.289 (.057)	.435 (.003)	.131 (.398)	–.258 (.091)
2. Number of emotional shifts	.222 (.035)	-	.771 (<.001)	–.189 (.219)	.016 (.917)	.060 (.700)	–.058 (.706)	–.180 (.242)
3. Intensity of emotional shifts	.368 (<.001)	.769 (<.001)	-	–.103 (.507)	.018 (.905)	.118 (.446)	.154 (.318)	–.106 (.495)
4. Attitude twd. agricultural techniques (cogn.-level)	.133 (.210)	–.001 (.992)	–.028 (.792)	-	–.094 (.544)	–.304 (.045)	.107 (.489)	.001 (.996)
5. Attitude twd. Sahel people (affect.-level)	.314 (.002)	.128 (.228)	.203 (.054)	.076 (.474)	-	.381 (.011)	.090 (.562)	–.194 (.208)
6. Social sharing intentions	.516 (<.001)	.216 (.040)	.346 (<.001)	.001 (.993)	.482 (<.001)	-	.209 (.174)	–.084 (.588)
7. NfA - Approach	.222 (.034)	–.038 (.720)	.088 (.407)	.013 (.900)	.053 (.619)	.241 (.022)	-	–.360 (.017)
8. NfA - Avoidance	–.169 (.109)	–.111 (.296)	–.129 (.224)	–.153 (.148)	–.245 (.019)	–.119 (.262)	–.211 (.045)	-

Note. Results for desertification story groups (n = 91) are displayed below the diagonal, for the marathon story group above the diagonal (n = 44). Correlation p-values in brackets.

S10 Relationship of Shifts in Specific Emotions – Further Analyses (Experiments 1 & 2)

The specific emotions that are relevant for a story's impact vary with every story and its specific structure. We were interested in generalizable statements about emotional shifts across different narratives, therefore we conducted our main analyses with a general measure of the intensity of emotional shifts that is computed from variables quantifying the intensity of shifts within every emotion we assessed (see S12). However, we conducted additional analyses using these more specific variables to gain insight into the role discrete emotions played for the narrative impact of each story.

Table S10a.

Correlations of Intensity of Emotional Shift Variables with Transportation and Story-Related Attitudes (Experiment 1)

Variable		Transportation	Attitudes twd. old-age romance	Attitudes twd. old-age suicide
Intensity of emotional shifts				
(a)	General	.448 (<.001)	.197 (.026)	.086 (.334)
(b)	Happiness	.452 (<.001)	.125 (.158)	.080 (.370)
(c)	Sadness	.376 (<.001)	.144 (.106)	.131 (.139)
(d)	Anger	.380 (<.001)	.232 (.008)	.125 (.159)
(e)	Fear	.243 (.006)	.188 (.033)	.059 (.509)
(f)	Disgust	.215 (.015)	.125 (.159)	.039 (.665)
(g)	Surprise	.351 (<.001)	.074 (.406)	-.043 (.626)

Note. $N = 128$. Correlation p-values are shown in brackets.

Table S10b.

Correlations of Intensity of Emotional Shift Variables with Transportation and Story-Related Attitudes and Intentions (Experiment 2)

Variable	Transportation	Attitude twd. agricultural techniques (cogn.-level)	Attitude twd. Sahel people (affect.-level)	Social sharing intentions
Intensity of emotional shifts				
(a) General	.368 (<.001)	-.028 (.792)	.203 (.054)	.346 (<.001)
(b) Happiness	.387 (<.001)	.079 (.459)	.078 (.465)	.253 (.016)
(c) Sadness	.424 (<.001)	-.002 (.986)	.322 (.002)	.324 (.002)
(d) Anger	.318 (.002)	-.002 (.988)	.085 (.421)	.234 (.026)
(e) Fear	.245 (.019)	-.147 (.164)	.177 (.093)	.365 (<.001)
(f) Disgust	.144 (.174)	-.065 (.541)	.238 (.023)	.351 (<.001)
(g) Surprise	.169 (.108)	.016 (.880)	.024 (.821)	.047 (.661)

Note. $N = 91$. Correlation p-values are shown in brackets.

S11 Distribution of Number of Emotional Shifts Variable (Experiments 1 & 2)

One of our emotional shift indicators (the number of emotional shifts) represents count data. Because count data often deviates from a normal distribution, we checked the skewness and kurtosis and inspected the histograms for this variable (Table S11, Figures S11a and S11b). The distributions of both variables seemed sufficiently normal in both experiments.

Table S11

Descriptive Statistics of Number of Emotional Shifts in Experiment 1 and 2

	Number of Emotional Shifts	
	Experiment 1 (N = 128)	Experiment 2 (N = 91)
M	13.61	10.93
Md	14	11
SD	4.10	3.08
Skewness	-0.60	-0.32
SE of Skewness	0.21	0.25
Kurtosis	0.06	-0.33
SE of Kurtosis	0.43	0.50
Min	3	2
Max	21	17

Figure S11a

Distribution of Number of Emotional Shifts (Experiment 1)

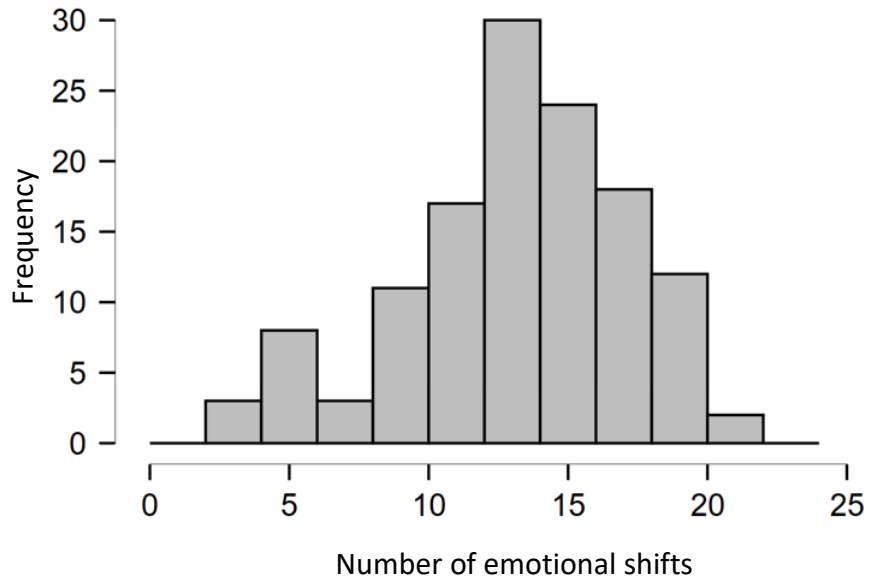
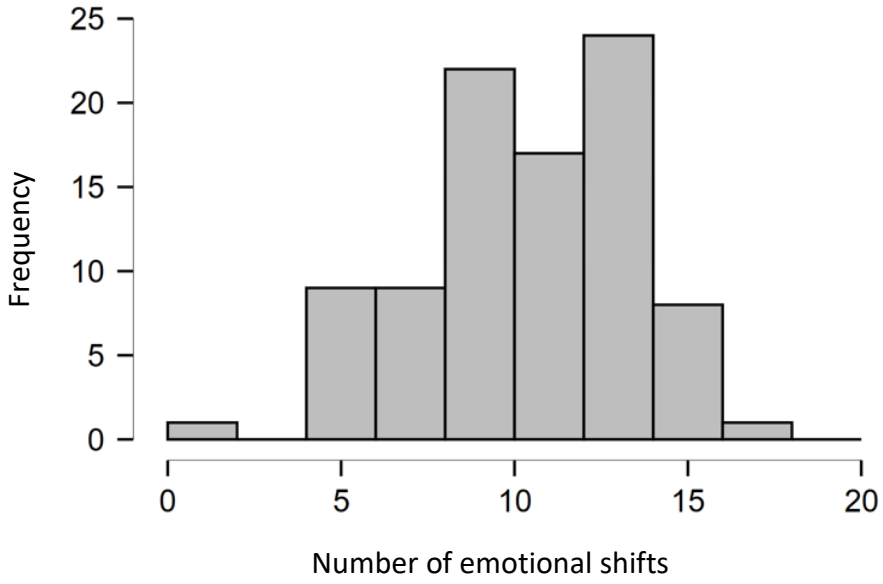


Figure S11b

Distribution of Number of Emotional Shifts (Experiment 2)



S12 Further Methodological Information

Treatment of occasional missing values in emotion-ratings

Whenever participants had omitted ratings of emotions for "E"s they were supposed to specify, we assumed the lowest possible value (1). Occasionally, participants would tick two rating points for one emotion but none for the preceding or subsequent emotion, indicating they had slipped in the line. In those cases, we substituted both values with the mean of both scores (e.g., anger is scored with both 1 and 5, happiness score is missing – both anger and happiness receive a score of 3). This never affected which emotion was coded as dominant.

Example calculation for the intensity of emotional shifts variable

To calculate our intensity of emotional shifts variable, we first summed up the absolute difference between subsequent e-specifications for each emotion. Then we summed up the resulting individual scores into one new variable. To illustrate this with an example: a participant specified five "E"s and reported the following scores for each emotion (1 = lowest, 7 = highest):

	Happiness	Sadness	Anger	Fear	Disgust	Surprise
E1	1	4	1	5	1	6
E2	1	1	6	2	4	1
E3	6	1	1	1	1	5
E4	6	1	1	1	1	1
E5	3	5	4	1	3	4

First, the intensity of shifts is calculated for each emotion separately:

Intensity of happiness shifts is |(1-1)| + |(6-1)| + |(6-6)| + |(3-6)| = 8

Intensity of sadness shifts is |(1-4)| + |(1-1)| + |(1-1)| + |(5-1)| = 7

Intensity of anger shifts is |(6-1)| + |(1-6)| + |(1-1)| + |(4-1)| = 13

Intensity of disgust shifts is |(4-1)| + |(1-4)| + |(1-1)| + |(3-1)| = 8

Intensity of surprise shifts is |(1-6)| + |(5-1)| + |(1-5)| + |(4-1)| = 16

Second, the resulting scores are summed up into the final score:

Intensity of emotional shifts score is 8 + 7 + 13 + 8 + 16 = 52

Treatment of behavioral variable/donations (Experiment 2)

Upon receiving their compensation, study participants had the opportunity to actually make a donation to the organization Terra-Verde. Except for two participants, everyone made the exact donation as they indicated in the questionnaire. The two participants who did not both indicated that they did not want to donate, but then donated 2€. As they both participated at the same date and time (parallel participation in the study was possible), it is possible that these subjects may have discussed their donation while waiting in line for their compensation. For these two cases, we included the value they stated in the questionnaire in the data analysis. The collected sum was donated to Terra-Verde e.V. after data collection was completed.

10 Manuscript 3 – Story Structure and Narrative Transportation

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Story structure and narrative transportation: Examining the effects of happiness and sadness shifts in stories with a happy ending

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The data, code, and stimulus material to this article is available at

https://osf.io/y7dv8/?view_only=88f3d6e1034b4fe3bf42988954f73cb2

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Abstract

The present research investigates whether the series of emotional shifts (emotional flow) experienced in response to a story's unfolding events foster narrative transportation. We present two experiments in which we manipulated stories to represent shifting versus positive-only emotional trajectories and examine effects on happiness and sadness shifts, overall self-reported emotional flow, and transportation. Results provide evidence in favor of the emotional flow framework. Consistently across both experiments, we found that emotional flow was positively associated with transportation and that shifts in happiness, but not sadness, predicted transportation. Whereas story versions did not affect transportation directly, our results suggest that transportation may be driven particularly by increases of happiness, which may best be enabled by stories with shifting emotional trajectories.

Keywords: narrative structure; emotional shifts; emotional flow; transportation

Story structure and narrative transportation: Examining the effects of happiness and sadness shifts in stories with a happy ending

Listening to stories is one of the oldest forms of communication (Gottschall, 2013) and stories or narratives (we use both terms interchangeably) are ubiquitous in people's present-day lives. A story is typically defined as a representation of a series of events, which often involves a challenge or conflict for a protagonist (Abbott, 2002; Freytag, 1863; Kreuter et al., 2007). In recent years, research on narrative processing and effects has begun to examine narrative patterns and the dynamic emotional responses that result from a story's unfolding events (e.g., Appel et al., 2019; Nabi, 2015; Nabi & Green, 2015). Following Nabi and Green (2015), these emotional dynamics represent an essential component of understanding narrative processing and the engagement with the story in terms of narrative transportation.

The research presented here tests one of the core assertions of Nabi and Green's (2015) framework: Emotional shifts facilitate transportation. Our focus is on a particularly prevalent emotional trajectory in Western storytelling, stories with a negative shift in the middle, and a happy ending. This type of emotional arc, also referred to as *man in a hole*, is one of the most common structures among fictional books (Reagan et al., 2016), and Hollywood movies with a *man in a hole* structure generate the highest box office revenues (del Vecchio et al., 2021). The success of stories with this type of emotional arc may be explained by people's natural preference for happy endings, meaning that if an experience consists of a negative and a positive component, individuals generally prefer when the positive event comes at the end (Ross & Simonson, 1991). This principle has found wide application in marketing and advertising, which is often structured in a way to elicit a positive

emotion after a negative emotion (Guido et al., 2018), but also in health communication (e.g., Carrera et al., 2010; Hamby & Brinberg, 2016).

In two experiments, we examine recipient responses to stories with a *man in a hole* structure as compared to stories with positive events throughout the story. We investigate the influence of story structure and emotional shifts on transportation by using a three-way approach: Overall transportation scores are observed as a function of a) the experimental text, b) recipients' overall self-reported emotional flow, and c) happiness and sadness shifts at crucial transitions. Research on story processing and effects is usually based on movies or video clips or on written texts, few (if any) studies on narrative transportation have examined audio-only stories. We did not assume that key mechanisms would change with the mode of presentation but using audio-only stories still seemed like a worthwhile extension of existing research.

Emotional shifts as drivers of transportation

The experience of transportation (largely overlapping concepts in the literature are absorption, immersion, narrative involvement or narrative engagement, e.g., Busselle & Bilandzic, 2008; Hakemulder et al., 2017; Slater & Rouner, 2002) is characterized by a participative feeling of being swept up into the world of a story and leaving the real world behind (Gerrig, 1993). This includes heightened attention towards the story, constructing mental models of the unfolding events, taking over the perspective of the characters, and the experience of strong emotions (Green & Brock, 2000). Research has identified some of the factors that foster transportation, which include audience dispositions, such as an individual's need for affect (Appel & Richter, 2010), reading goals and secondary tasks (Bezdek & Gerrig, 2017; Green, 2000), as well as extra-textual information, such as reviews (Tiede & Appel, 2020).

Key predictors of transportation are the properties of the text itself. Of particular relevance is the story structure or narrative arc. Narratives involve a representation of events

connected through time, space, and a causal structure, during which characters typically encounter and overcome conflicts or obstacles (e.g., Aristotle, ca. 350 B.C.E./1994; Dahlstrom, 2014; Freytag, 1863; Kreuter et al., 2007). Recent research using automated large-scale language analysis methods has found strong evidence of the classical narrative structures described in narrative theory: setting of the stage at the beginning, and a rise and fall in cognitive tension as the plot progresses towards the middle and ending of a story (Boyd et al., 2020). Furthermore, sentiment analyses of books and movie scripts reveal that the emotional trajectory of narratives (the emotional arc) typically follows one of six basic patterns, which are characterized by changes in emotional valence (del Vecchio et al., 2021; Reagan et al., 2016).

Following the emotional arc of a story implies changes in emotional responses on the side of the recipient as the story unfolds. These dynamic changes in emotional experiences, termed *emotional shifts*, are at the core of Nabi and Green's (2015) approach to explain the mechanisms of narrative impact. The emotional shifts audiences experience over the course of a narrative can be changes between emotions with opposing valence (e.g., from happiness to sadness or vice versa), between emotional states of similar valence (e.g., from sadness to anger), or even "[m]arked variation in the intensity of a specific emotional experience" (Nabi & Green, 2015, p. 143). The series of emotional shifts audiences experience throughout a story is referred to as *emotional flow.* According to Nabi and Green (2015), the experience of emotional shifts helps sustain attention to the story and reinforces audiences' transportation into a narrative. The authors offer several explanatory approaches for this hypothesis.

First, suspense represents one of the most common narrative experiences related to emotional shifts audiences can experience because of structural features of the narrative: Suspense arises when a narrative signifies a future negative event for a story protagonist, which prompts audiences to hope for a positive outcome for the character, yet fear for a negative outcome (Zillmann, 1991). Audiences may shift between hope and fear throughout

the story, depending on the chances for a positive or negative outcome that are insinuated as the story events unfold (Nabi & Green, 2015). Some research has demonstrated that suspense increases self-reported transportation (de Graaf & Hustinx, 2011) and that during moments of high suspense attention to peripheral stimuli decreases, as indicated by reduced activity in peripheral visual processing areas of the brain (Bezdek et al., 2015) and slower secondary task reaction times (Bezdek & Gerrig, 2017).

Second, excitation transfer theory (Zillmann, 1983, 1996) holds that because excitatory adjustment is slower than the pacing of most narratives (audiovisual narratives in particular), arousal induced by a story event may carry over and intensify the emotional experience induced by the subsequent event. This enhanced arousal may in turn reinforce engagement with the narrative and its characters (Nabi & Green, 2015).

Third, the limited capacity model of motivated mediated message processing (LC4MP, Lang, 2000) supports the notion that changes in emotional content increase the cognitive resources allocated towards message processing. Formal features of a narrative that act as emotional stimuli may trigger orienting responses, an automatic cognitive mechanism that directs attention towards information that is new. Negative imagery or emotional words may generate orienting responses that redirect attention to the story (Lang, 2017; Lee & Potter, 2020; Nabi & Green, 2015). Furthermore, positive and negative emotional experiences elicited by the story activate the appetitive and aversive motivational systems, respectively, which has different implications for the resources directed towards encoding and storing of the information (Lang et al., 2013). For example, Lang et al. (2013) investigated overtime processing of videos with different types of emotional trajectories. They observed that an appetitive system activation (as induced by positive messages) increased encoding over time, whereas aversive system activation (associated with negative messages) lead to high encoding at the beginning of the message and increased storage later on. Similarly, a study by Clayton and colleagues (2019) has demonstrated that cognitive resources allocated to a self-

transcendent video increased after the central shift from negative to positive in the emotional trajectory of the narrative.

Study Overview and Predictions

Some initial empirical evidence supports the idea that narratives which induce shifting emotional responses may have an advantage over single-emotion narratives with respect to memory (Guido et al., 2018), and persuasion (Carrera et al., 2008, 2010). However, the influence of story structures and recipients' emotional shifts on participants' transportation still remains to be addressed by empirical research.

In two studies, we manipulated the emotional arc of stories to represent a shifting versus a positive-only (no-shift) emotional trajectory. The stories followed a three-part structure (beginning/exposition – middle/complication – end/resolution). The shifting story versions resemble the *man in a hole* structure, with a shift from positive to negative and back to positive. In Experiment 1, the shift from negative to positive was created by including a negative turn of events in the middle of a story, whereas the positive version of this story included a positive event. In Experiment 2, the shift was created not by manipulating the event itself, but the protagonist's appraisal of the event as positive or negative.

Transportation served as our focal dependent variable. First, we expected that transportation was higher in the shifting story version as compared to a positive story version (Hypothesis 1). Second, we assumed that self-reports about the overall emotional flow experienced during the story would be related to transportation (Hypothesis 2). To this end, a self-report measure was developed and applied. This measure is intended to be applicable to a variety of different narratives, regardless of presentation mode (auditive, audiovisual, written) or the specific emotional arc represented by the story. Third, happiness and sadness were assessed for each of the three story parts. We expected the change scores in happiness (Hypothesis 3a, b) and sadness (Hypothesis 4a, b) from exposition to complication (Shift 1) and from complication to resolution (Shift 2) to predict transportation. We further expected

the two sequential shifts in happiness (Hypothesis 5) and sadness (Hypothesis 6) to mediate the influence of story structure on transportation.

Pilot Study

The two main experiments involved a novel self-report measure of emotional flow (see Hypothesis 2). We created nine items to capture audiences' overall experience of emotional flow after story exposure, which were rated from 1 (not at all) to 7 (completely). The items referred to the story as a whole and were phrased to capture the general experience of shifting emotions, regardless of the particular emotions involved (e.g., "Listening to the story was a constant emotional up and down for me"; "As I followed the story, I experienced a series of different emotions", see Appendix for the items). To establish trust in the psychometric properties of the Emotional Flow Self-Report Scale, we conducted a pilot study. An online sample of 138 participants viewed one of two short audiovisual stories with different emotional arcs (positive-to-negative vs. negative-to-positive). After the video, participants completed the Emotional Flow Scale, the Appreciation, Fun, and Suspense scales (Oliver & Bartsch, 2010), and rated the intensity of seven emotions experienced before and after the trajectory shift in the story. Across both stories, internal consistency was excellent for emotional flow (Cronbach's $\alpha = .91$), good for fun ($\alpha = .83$), and acceptable for appreciation ($\alpha = .76$), and suspense ($\alpha = .75$). As expected, emotional flow correlated with the related experiences of suspense ($r = .430$, $p < .001$) and appreciation ($r = .440$, $p < .001$) more strongly than with fun ($r = .202$, $p = .017$, the difference between correlations of emotional flow with fun and suspense is significant, $z = -2.62$, $p = .009$, Meng et al., 1992[6]). Furthermore, emotional flow was related to the degree to which the intensity ratings of both positive and negative emotions changed between story parts (see Supplement 1 for a more

[6] Correlations were compared using the *cocor* package for R (Diedenhofen & Musch, 2015).

detailed description of the pilot study and results separated by story). Taken together, the pilot study supported the reliability and construct validity of the emotional flow measure.

Experiment 1

Experiment 1 tested the predictions using a narrative about a care assistant robot. We created a shifting and a positive only story version by including either a negative or a positive event in the middle part of the story.

Method

Participants and Sample Size Requirements

A sample of 90 participants is required to detect the focal effect of our independent variable (story structure: shifting versus positive only) on transportation (with $\alpha = .05$, $1\text{-}\beta = .80$ and assuming a medium effect size of $d = 0.60$; Cohen, 1988; optimal sample size computed with G*Power, Faul et al., 2007). A total of 116 individuals participated in the laboratory study for course credit or a financial reward. The data of two participants were excluded from the final sample due to disruptions during the session (fire alarm, one participant was unwell), a third participant failed an attention check item. The remaining 113 participants (87 women) were 22.26 years old on average ($SD = 3.84$ years) and predominantly university students ($n = 106$).

The Story and Manipulation of the Narrative Arc

All participants listened to one of two versions of a story about a care assistant robot via headphones (1408 words, 9:04 min duration). The story versions were drafted by a professional author, who was recruited to support this project, and were revised to fit the methodological requirements of the experiments. A professional male narrator recorded the final stories in a studio.

The stories consisted of three parts (exposition, complication, resolution, see Supplement S3 for the stimulus material). Only the middle part of the story differed between conditions to create one story with a narrative arc, implying emotional shifts from positive to

negative and back to positive, versus a positive-only story structure. Both versions tell the story of Maria, an elderly lady who lives alone and is occasionally visited by Sophie, a nurse who is taking care of her. One day shortly before Christmas, Sophie is accompanied by PAL, a care assistant robot that helps Sophie with some of her tasks and allows her to dedicate more time to the social aspects of her caretaking job (exposition). In the emotional shift version of the story, Maria then receives an upsetting phone call from her daughter, who cancels her and her family's visit for Christmas (complication). In the positive-only version of the story, Maria's daughter calls to confirm her and her family's Christmas visiting plans. Both story versions end with the happy news that Sophie invites Maria to her yearly Christmas party (resolution).

Measures

Emotional Responses. After the audio was completed, participants rated the degree to which they experienced six basic emotions (happiness, sadness, anger, fear, disgust, surprise) during each of the three parts of the story. Each emotion was rated on a 7-point rating scale ranging from 1 (not at all) to 7 (completely). For each story part, a brief summary was provided as a cue. The summaries were carefully phrased to be descriptive of the event while at the same time avoiding any suggestion of a particular emotional response. Identical summaries were used in both conditions (e.g., for the middle part: "Maria and her daughter talk about the upcoming Christmas visit on the phone", see Supplement S3). We focused on happiness and sadness as they applied best to the story content. To quantify the degree to which participants experienced emotional shifts of happiness and sadness, we computed four difference scores (two for each emotion) to represent the changes in happiness and sadness between subsequent story parts, i.e., from exposition to complication (Shift 1), and from complication to resolution (Shift 2). Positive values of the shift variables represent an increase of the corresponding emotion from one story part to the next, negative values represent a

decrease. For some of the analyses (see below) absolute scores were used (i.e., + 1.45 and – 1.45 were both scored + 1.45, indicating a shift irrespective of its direction).

Self-Reported Experience of Emotional Flow. We assessed participants' overall experience of emotional flow after the story had ended, using the Emotional Flow Self-Report Scale (see pilot study). Cronbach's α was .95.

Transportation. We measured transportation once for the story as a whole using the German version of the Transportation Scale-Short Form (Appel et al., 2015). The six items (e.g., "I could picture myself in the scene of the events described in the narrative") were rated from 1 (not at all) to 7 (completely). For the two items capturing the imaginative component of transportation ("While reading the narrative I had a vivid image of [character]"), the names of the characters Maria and Sophie were inserted (Cronbach's α = .86).

Procedure

The data for this study were collected as part of a larger, partly exploratory project in two different laboratories of the University of [blinded]. The study materials and procedures were approved by the Ethics Committee of the Institute of Psychology at the authors' institution beforehand. In addition to the measures outlined above, the experiment included the assessment of psychophysiological measures, need for affect, and self-reports of story-related attitudes (see Supplement S2 for extensive description of the procedure). Due to the complexity of the project, the results concerning the physiological measures and story-related attitudes are reported in a separate manuscript.

Participants entered the lab individually. After giving their informed consent, participants first answered a short questionnaire that assessed sociodemographic data and details relevant to the physiological measures. Then, participants listened to the story. Next, they answered the transportation questionnaire and rated their emotional experience for each story part. This was followed by the emotional flow questionnaire. Finally, participants were debriefed and compensated.

Results and Discussion

We first examined whether the story versions affected the experience of emotional shifts and emotional flow, and assessed the relationship between our overall emotional flow measure and emotional shifts between story parts. Then, we examined the effects of story versions on transportation and the relationship between transportation, emotional flow, and emotional shifts, before testing a serial mediation model.

Effects of Story Versions on Happiness and Sadness Ratings

The shifting and the positive-only versions of the stimulus story were manipulated to differ in the middle part. Thus, in the shifting version, happiness ratings should be lower and sadness ratings higher than in the positive version. Furthermore, the intensity of emotion ratings should fluctuate over the course of the narrative in the shift condition and represent an inverted u-shape for sadness and a u-shape for happiness. To check whether the self-reported emotions of participants reflected the emotional arcs of the two different story versions, we conducted mixed analyses of variance (ANOVA) using the different story parts as a within-participant factor and condition (story version) as the between-participant factor to predict ratings of happiness and sadness. Means and standard deviations of emotion ratings per story part and condition are reported in Table 1 and illustrated in Figures 1a and 1b.

Table 1

Means and Standard Deviations for the Emotion Ratings in Experiment 1.

	Happiness				Sadness			
	Shift cond. (n = 53)		Positive cond. (n = 60)		Shift cond. (n = 53)		Positive cond. (n = 60)	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Means								
Exposition	4.34	1.33	4.40	1.24	2.04	1.33	1.60	0.91
Complication	3.77	2.10	5.20	1.59	3.34	2.02	1.53	1.00
Resolution	5.45	1.42	5.42	1.57	2.23	1.54	1.23	0.53
Difference Scores								
Shift 1	-0.57	2.41	0.80	1.45	1.30	2.19	-0.07	1.04
Shift 2	1.68	2.70	0.22	1.22	-1.11	2.39	-0.30	0.96

Note. The shift variables represent difference scores of emotion ratings between subsequent story parts (shift 1 = exposition to complication, shift 2 = complication to resolution), where a positive score indicates an increase of the corresponding emotion and a negative score a decrease.

Figure 1a

Mean Emotion Ratings for Happiness per Story Part in Experiment 1

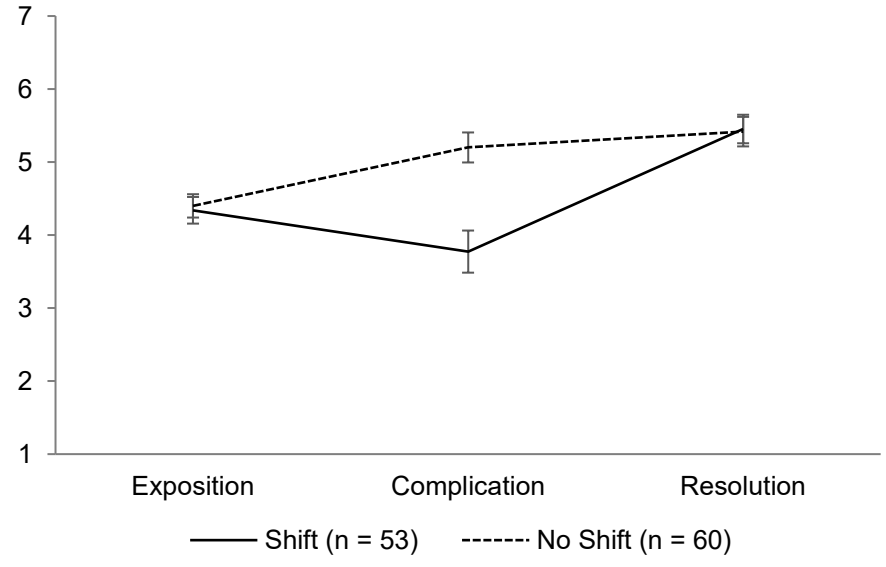
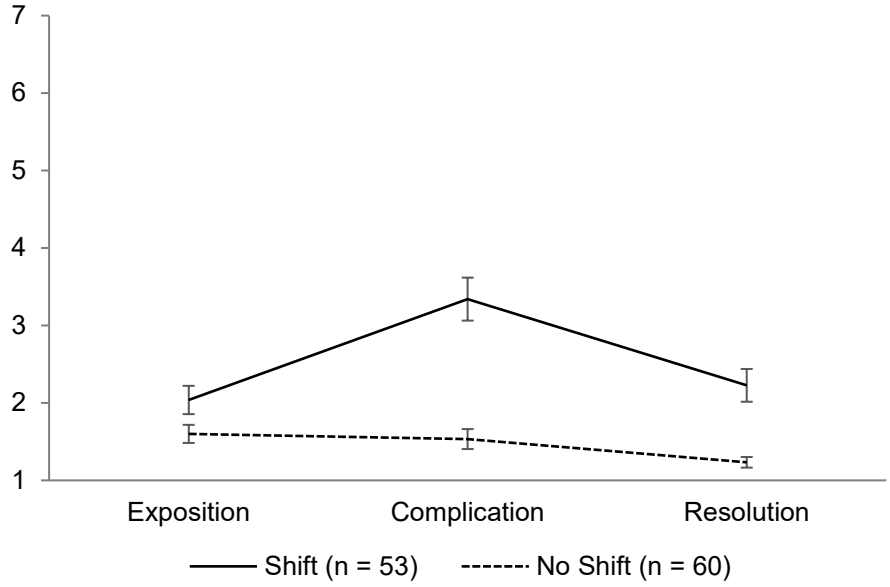


Figure 1b

Mean Emotion Ratings for Sadness per Story Part in Experiment 1



We found a significant interaction effect between condition and story parts for happiness, $F(1.86, 205.91) = 10.86$, $p < .001$, $\eta^2_p = .09$[7], and for sadness, $F(2, 222) = 9.73$, $p < .001$, $\eta^2_p = .08$. To examine the conditional effects, we calculated contrasts and pairwise comparisons. As expected, for the middle part (complication) participants reported significantly higher sadness, $F(1, 111) = 37.63$, $p < .001$, $\eta^2_p = .25$, and lower happiness, $F(1, 111) = 16.78$, $p < .001$, $\eta^2_p = .13$, in the shifting than in the positive story version. In the shift condition, happiness significantly decreased in the complication compared to the exposition, $M_{Dif} = -0.57$, $SE = 0.27$, $p = .038$, $d = -0.23$, and then significantly increased again at the end, $M_{Dif} = 1.68$, $SE = 0.28$, $p < .001$, $d = 0.62$. At the same time, sadness significantly increased in the complication compared to the exposition, $M_{Dif} = 1.30$, $SE = 0.23$, $p < .001$, $d = 0.59$, and then decreased at the resolution, $M_{Dif} = -1.11$, $SE = 0.25$, $p < .001$, $d = -0.47$. In the positive condition, sadness did not change significantly over the course of the narrative (exposition to complication: $M_{Dif} = -0.07$, $SE = 0.22$, $p = .759$, $d = -0.06$, complication to resolution: $M_{Dif} = -$

[7] Assumption of sphericity is slightly violated, $\chi^2(2) = 12.19$, $p = .002$, therefore Huynh-Feldt corrected results are reported ($\varepsilon = .928$).

0.30, SE = 0.23, p = .195, d = -0.31). There was a significant increase of happiness in the middle part of the story compared to the exposition, M_{Dif} = 0.80, SE = 0.25, p = .002, d = 0.55, but no further increase towards the end, M_{Dif} = 0.22, SE = 0.26, p = .414, d = 0.18. Of note, sadness ratings differed significantly between conditions for the exposition, $F(1, 111) = 4.27$, p = .041, η^2_p = .04, and the resolution, $F(1, 111) = 22.00$, $p < .001$, η^2_p = .17. The latter result is likely due to a carry-over effect, a result of the slightly different meaning the story ending gains depending on the previous events. Because in the shift condition, the happy end of the story is preceded by a sad event, readers of the shifting story version may have interpreted the story ending as bittersweet and moving. Happiness ratings did not differ between conditions in the exposition, $F(1, 111) = 0.06$, p = .803, η^2_p = .00, or the resolution, $F(1, 111) = 0.16$, p = .898, η^2_p = .00. Overall, the manipulation of emotional shifts was successful.

Emotional flow as a function of story versions and happiness/sadness shifts

Next, we examined the influence of the story factor on the emotional flow scale. As expected, participants reported significantly and substantially higher emotional flow in the shift condition (M = 4.51, SD = 1.44) than in the positive condition (M = 2.92, SD = 1.21), $F(1, 111) = 40.75$, $p < .001$, η^2 = .27.

How did the happiness/sadness shifts relate to participants' emotional flow ratings? Because the two story versions imply different directions of emotional shifts (e.g., a decrease of happiness from exposition to complication in the shifting story version, but no change or an increase of happiness in the positive story version), we used the *absolute* scores of the emotional shift variables to conduct correlation analyses with emotional flow across conditions. Therefore, a positive value of r indicates a positive association of emotional flow with the intensity of emotional change, regardless of its direction (increase or decrease). Absolute shift scores in happiness and sadness from exposition to complication (first shift) were significantly associated with emotional flow, with $r(111) = .406$, $p < .001$, for happiness, and $r(111) = .521$, $p < .001$, for sadness, respectively. A similar pattern was observed for the

second shift from complication to resolution. Absolute shift scores in happiness, $r(111) = .444$, $p < .001$, and absolute shift scores in sadness, $r(111) = .584$, $p < .001$, were positively correlated with emotional flow (see Supplement 4 for analyses separated by story version).

Transportation as a Function of Story Versions, Emotional Shifts, and Emotional Flow

We conducted a univariate ANOVA to test whether the experimental manipulation affected participants' transportation (Hypothesis 1). In contrast to our expectations, participants in the shift-condition ($M = 5.22$, $SD = 1.23$) and in the no-shift-condition ($M = 4.98$, $SD = 1.10$) did not differ significantly in terms of transportation, $F(1, 111) = 1.19$, $p = .277$, $\eta^2 = .01$.

Next, we examined the association between emotional flow and transportation (Hypothesis 2). The overall relationship was $r(111) = .602$, $p < .001$, with $r(58) = .502$, $p < .001$ in the positive condition and $r(51) = .766$, $p < .001$, in the shift condition. Thus, we saw a strong relationship between self-reported, overall emotional flow and transportation.

Pearson correlations indicated that absolute shift scores in happiness (Hypothesis 3a) and sadness (Hypothesis 4a) from exposition to complication (first shift) were significantly associated with transportation, with $r(111) = .351$, $p < .001$, for happiness, and $r(111) = .248$, $p = .008$, for sadness, respectively. Likewise, for the second shift from complication to resolution, absolute shift scores in happiness, $r(111) = .196$, $p = .038$ (Hypothesis 3b), as well as absolute shift scores in sadness, $r(111) = .266$, $p = .004$ (Hypothesis 4b), were positively correlated with transportation (for the correlations by condition refer to Supplement S4).

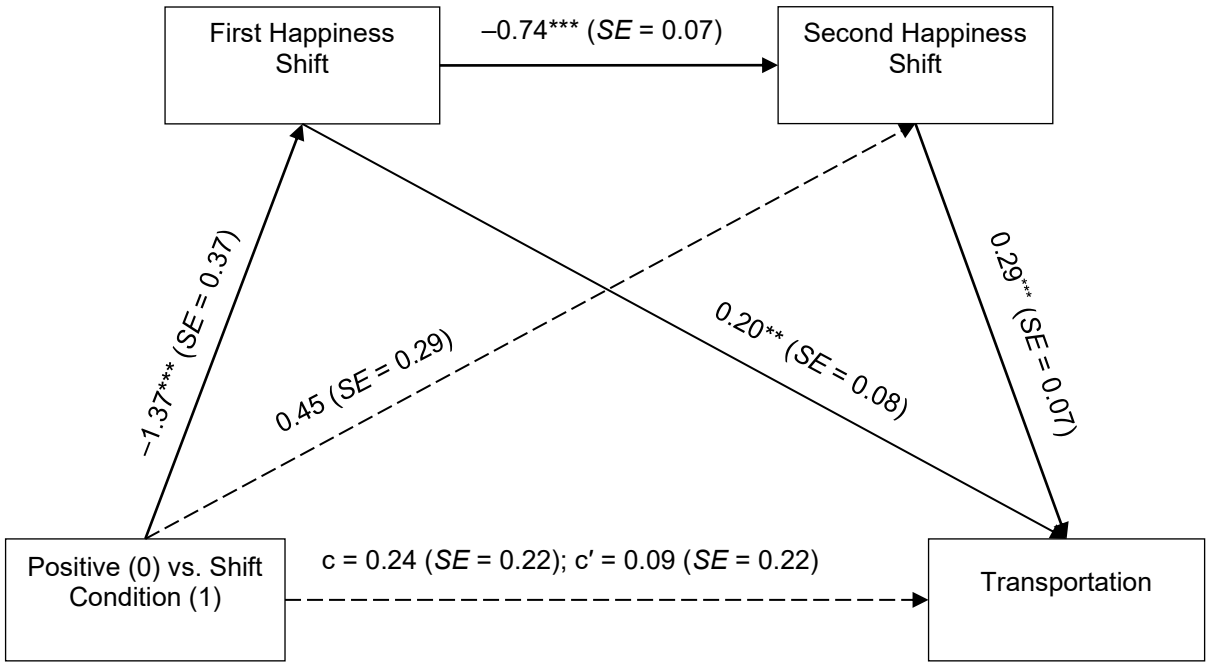
From Narrative Arc to Transportation: Testing the Two-Step Mediation Model

To test whether story versions indirectly affected transportation through the degree to which they induced shifts of happiness (Hypothesis 5) and sadness (Hypothesis 6), we estimated two sequential mediation models using PROCESS v3.5 (Model 6, Hayes, 2018). Condition served as the independent variable (0 = positive condition, 1 = shift condition), the

two happiness shifts or sadness shifts, respectively, as mediators (M1 = first shift from exposition to complication, M2 = second shift from complication to resolution), and transportation as the dependent variable. Mediation results are reported in detail in Supplement S5. There was no significant indirect effect via the two sadness shifts, $b = 0.05$, $SE = 0.08$, 95% CI [-0.11, 0.20] due to a lack of association between the second sadness shift and transportation. However, we found a significant indirect effect of condition via the two happiness shifts on transportation, $b = 0.30$, $SE = 0.12$, 95% CI [0.11, 0.55]. The shift condition elicited a greater decrease of happiness from exposition to complication than the positive condition, and the more happiness decreased from exposition to complication, the more happiness increased from complication to resolution. An increase of happiness from complication to resolution, in turn, was positively associated with transportation (Figure 2). Interestingly, an increase of happiness from exposition to complication as implied by the positive story version was positively associated with transportation as well. This resulted in a significant indirect effect of condition on transportation via the first happiness shift, $b = -0.28$, $SE = 0.12$, 95% CI [-0.54, 0.07].

Figure 2

Two-Step Mediation (Experiment 1)



Note. $N = 113$. Unstandardized regression coefficients are reported. The mediators represent difference scores of emotion ratings between subsequent story parts, where a positive score indicates an increase of the corresponding emotion and a negative score a decrease. Non-significant paths are marked by dotted lines.

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

Experiment 2

Experiment 2 tested the same predictions using a different sample and a different story as a stimulus. In contrast to the story used in Experiment 1, we aimed to manipulate the emotions elicited by the narrative arc of the story by changing the protagonist's interpretation of the event, instead of altering the event itself. Furthermore, we chose a story topic that we assumed would be particularly relatable to participants and elicit stronger emotional responses, given that our sample consists of mostly students.

Method

Participants, Sample Size Requirements and Procedure

The same sample size considerations as in Experiment 1 were applied, yielding an aspired sample size of 90 participants. Our sample consists of 103 participants who participated in the laboratory study at the University of [blinded] for course credit or a financial reward. No cases were excluded. Participants were 23.48 years old on average (*SD* = 6.66 years), predominantly female (*n* = 74), and university students (*n* = 95). The procedure was identical to Experiment 1.

The Story

Participants listened to one of two versions of a story about Simon, a student who reconsiders his career path after his parents decide to move away (pre-recorded audio, 1450 words, 9:11 min duration, see Supplement S6 for the stimulus material). The stories were developed by a research assistant and the first author of this manuscript and recorded by a professional male narrator. The story begins with Simon meeting up with a friend in the park. During their lighthearted conversation Simon confides doubts about his study program (exposition). The next day, he learns that his parents decided to move abroad to start a new life, which incites Simon to consider a life change for himself as well (complication). Fast forward ten years, Simon is happy with the new career he chose after his parents' move. Again, the stories were designed to either represent an emotional arc shifting from positive to negative and back to positive, or a positive-only trajectory and differed only with regard to the complication. However, instead of altering the event that represents the complication to induce happy versus sad emotional responses as in Experiment 1, we manipulated Simon's appraisal of the same event: In the shift-version, he is saddened by the news. He realizes that his current career path is reflective of his desire to please his parents and meet their perceived expectations rather than his own interests. In the happy-only version, Simon feels inspired by

his parents' bold decision. He realizes that there is no reason to see through with a study program he is unhappy with.

Measures

Emotional Responses. As in Experiment 1, participants rated their emotional responses for the three different story parts, which were introduced by a brief description of the event (e.g., for the middle part: "Simon visits his parents. He reflects on his parents' decision to move to China", see Supplement S6).

Self-Reported Experience of Emotional Flow. We used the same items as in Experiment 1 to measure participants' experience of emotional flow (Cronbach's $\alpha = .93$.)

Transportation. Again, we used the Transportation Scale-Short Form (Appel et al., 2015) to measure transportation. The two items that assess the imaginative component of transportation referred to the characters Simon and Simon's parents (Cronbach's $\alpha = .84$).

Results and Discussion

Effects of Story Versions on Happiness and Sadness Ratings

We used the same data analysis procedures as in Experiment 1. Again, we conducted a mixed ANOVA to test whether participants' emotion ratings of happiness and sadness reflected the emotional arcs of the shifting vs. positive story version, respectively. Means and standard deviations of happiness and sadness for each story part in the two conditions are summarized in Table 2 and illustrated in Figures 3a and 3b. Consistent with findings in Experiment 1, we found significant interaction effects between both factors for happiness, $F(2, 202) = 14.56$, $p < .001$, $\eta^2_p = .13$, and for sadness, $F(2, 202) = 3.63$, $p = .028$, $\eta^2_p = .04$.

Table 2

Means and Standard Deviations for the Emotion Ratings in Experiment 2

	Happiness				Sadness			
	Shift cond. (n = 43)		Positive cond. (n = 60)		Shift cond. (n = 43)		Positive cond. (n = 60)	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Means								
Exposition	4.02	1.26	3.75	1.36	2.16	1.41	2.27	1.44
Complication	2.70	1.51	4.00	1.62	3.19	1.59	2.55	1.57
Resolution	5.70	1.32	5.57	1.59	1.28	0.73	1.33	0.75
Difference Scores								
Shift 1	-1.33	1.67	0.25	1.73	1.02	1.50	0.28	1.69
Shift 2	3.00	1.73	1.57	1.61	-1.91	1.65	-1.22	1.55

Note. The shift variables represent difference scores of emotion ratings between subsequent story parts (shift 1 = exposition to complication, shift 2 = complication to resolution), where a positive score indicates an increase of the corresponding emotion and a negative score a decrease.

Figure 3a

Mean Emotion Ratings for Happiness per Story Part in Experiment 2

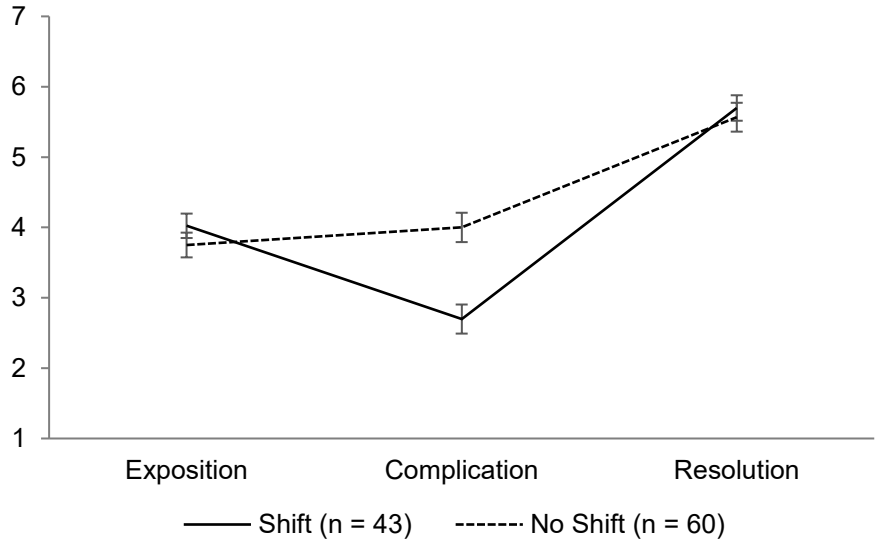
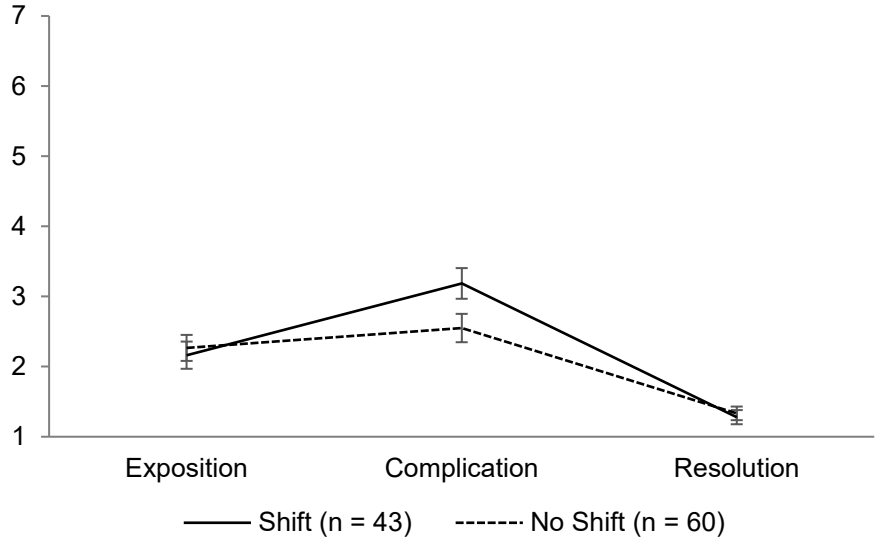


Figure 3b

Mean Emotion Ratings for Sadness per Story Part in Experiment 2



Analyses of the conditional effects show that again, in the middle part of the story (complication), happiness ratings were significantly lower, $F(1, 101) = 17.23$, $p < .001$, $\eta^2_p = .14$, and sadness ratings significantly higher in the shifting than in the positive condition, $F(1, 101) = 4.07$, $p = .046$, $\eta^2_p = .04$. Happiness ratings did not differ between conditions in the exposition, $F(1, 101) = 1.07$, $p = .303$, $\eta^2_p = .01$, nor in the resolution, $F(1, 101) = 0.20$, $p < .001$, $\eta^2_p = .002$. Equally, we found no significant difference between conditions for sadness ratings in the exposition, $F(1, 101) = 0.13$, $p = .716$, $\eta^2_p = .002$, or the resolution, $F(1, 101) = 0.13$, $p = .716$, $\eta^2_p = .002$. In the shift condition happiness was significantly lower in the complication than in the exposition, $M_{Dif} = -1.33$, $SE = 0.26$, $p < .001$, $d = -0.79$, and increased significantly from complication to resolution, $M_{Dif} = 3.00$, $SE = 0.25$, $p < .001$, $d = 1.73$. Furthermore, sadness increased significantly from exposition to complication, $M_{Dif} = 1.02$, $SE = 0.25$, $p < .001$, $d = 0.68$, and decreased again towards the resolution, $M_{Dif} = -1.91$, $SE = 0.24$, $p < .001$, $d = -1.16$. In the positive condition, there was no shift from the exposition to the complication neither for happiness, $M_{Dif} = 0.25$, $SE = 0.22$, $p = .260$, $d = 0.14$, nor for sadness, $M_{Dif} = 0.28$, $SE = 0.21$, $p = .177$, $d = 0.17$. However, from complication to resolution there was a significant increase in happiness, $M_{Dif} = 1.57$, $SE = 0.21$, $p < .001$, $d = 0.97$, and a

significant decrease of sadness, M_{Dif} = -1.22, SE = 0.21, $p < .001$, d = -0.78. In sum, the manipulation of emotional shifts was successful.

Emotional flow as a function of story versions and happiness/sadness shifts

The effect of the story versions on overall self-reported emotional flow did not differ significantly between the shift-condition (M = 4.08, SD = 1.10) and the positive condition (M = 4.03, SD = 1.42), $F(1, 101) = 0.03$, $p = .867$, $\eta^2 = .00$. This result is in contrast to Experiment 1.

Absolute shift scores in happiness from exposition to complication (first shift) were only marginally associated with emotional flow, $r(101) = .170$, $p = .087$. For the first sadness shift, the association was significant, $r(101) = .207$, $p = .036$. For the second shift from complication to resolution, absolute shift scores in happiness, $r(101) = .290$, $p = .003$, and absolute shift scores in sadness, $r(101) = .214$, $p = .030$, were positively correlated with emotional flow (see Supplement 7 for analyses separated by story version).

Transportation as a Function of Story Versions, Emotional Shifts, and Emotional Flow

In contrast to our expectations (Hypothesis 1), but in line with Experiment 1, transportation in the shift-condition (M = 5.45, SD = 0.96) did not differ significantly from the positive condition (M = 5.38, SD = 1.02), $F(1, 101) = 0.14$, $p = .707$, $\eta^2 = .00$.

Next, we examined the relationship between emotional flow and transportation (Hypothesis 2). Consistent with Experiment 1, we observed a strong association between self-reported, overall emotional flow and transportation across conditions, $r(101) = .695$, $p < .001$, with $r(58) = .696$, $p < .001$, in the positive condition and $r(41) = .702$, $p < .001$, in the shift condition.

Unlike Experiment 1, Pearson correlations indicated that absolute shift scores in happiness (Hypothesis 3a) and sadness (Hypothesis 4a) from exposition to complication (first shift) were not significantly associated with transportation, with $r(101) = .137$, $p = .168$, for

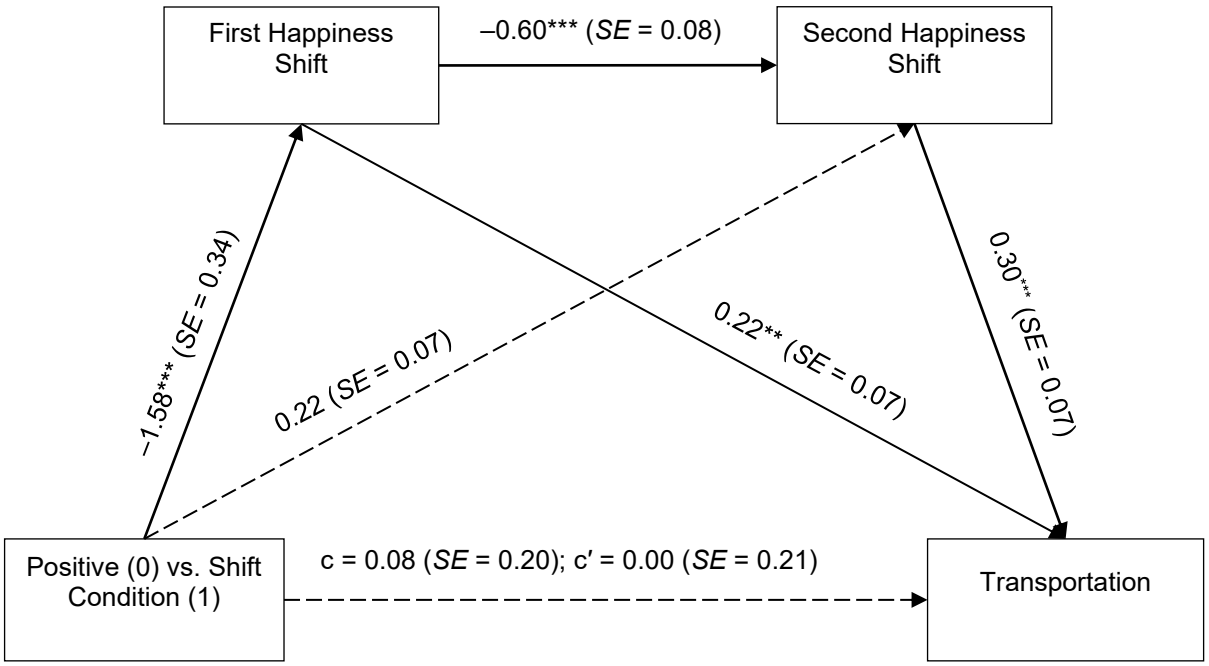
happiness, and $r(101) = .026$, $p = .794$, for sadness, respectively. For the second shift from complication to resolution, absolute shift scores in happiness were positively associated with transportation, $r(101) = .224$, $p = .023$ (Hypothesis 3b), whereas the absolute shift scores for sadness were not, $r(101) = .157$, $p = .112$ (Hypothesis 4b). Correlation analyses separated by condition are reported in Supplement S7.

From Narrative Arc to Transportation: Testing the Two-Step Mediation Model

As in Experiment 1, we estimated two serial mediation models (PROCESS v3.5, model 6, Hayes, 2018) to determine if story versions had an indirect effect on transportation via emotional shifts of happiness (Hypothesis 5) and sadness (Hypothesis 6). Condition was entered as the independent variable (0 = positive condition, 1 = shift condition), the happiness or sadness shifts, respectively, as mediators (M1 = first shift from exposition to complication, M2 = second shift from complication to resolution), transportation as the independent variable. Results of mediation analyses are reported in detail in Supplement S8. Consistent with results in Experiment 1, we found a significant indirect mediation via the two happiness shifts, $b = 0.28$, $SE = 0.09$, 95% CI [0.12, 0.48], but not via the two sadness shifts, $b = 0.07$, $SE = 0.05$, 95% CI [-0.00, 0.18]. Closer inspection of the paths (Figure 4) shows that, as in Experiment 1, condition had a negative effect on the first happiness shift, indicating that the shift condition elicited a stronger decrease of happiness than the positive condition. The more happiness decreased from exposition to complication, the more it increased from complication to resolution, and an increase of happiness towards the end of the story was positively related to transportation. However, an increase of happiness from exposition to complication elicited by the emotional arc of the positive story version was also associated with transportation, as indicated by a significant indirect effect of condition on transportation via the first happiness shift, $b = -0.35$, $SE = 0.13$, 95% CI [-0.61, -0.12].

Figure 4

Two-Step Mediation (Experiment 2)



Note. $N = 103$. Unstandardized regression coefficients are reported. The mediators represent difference scores of emotion ratings between subsequent story parts, where a positive score indicates an increase of the corresponding emotion and a negative score a decrease. Non-significant paths are marked by dotted lines.

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

General Discussion

The processing and the effects of stories have become a major field of research in the social sciences, but the dynamic nature of unfolding events and related emotional experiences are rarely explored in empirical studies. Our project was meant to address this research lacuna. More specifically, the present research tested a core prediction of the emotional shifts framework (Nabi & Green, 2015), which asserts that emotional shifts drive transportation. To this end, we manipulated the emotional arcs of stories to represent a shifting versus a positive emotional trajectory. The shifting story versions resembled a *man in a hole* structure, where

mid-story the protagonist encounters ill-fortune or conflict, but which ends positively for the protagonist.

The results of the two experiments provide evidence in favor of the propositions of the emotional shifts framework (Nabi & Green, 2015).[8] Across both experiments, the story manipulation successfully evoked greater shifts of happiness and sadness within readers of the shifting story version than a positive story version, which differed only in the middle part of the stories. Importantly, self-reported emotional flow was positively associated with transportation in both experiments, lending support to Hypothesis 2.

Furthermore, emotional flow was significantly associated with all but one of the individual emotional shifts participants experienced in response to the stories: In Experiment 1, emotional flow correlated with the absolute shift scores of happiness and sadness for both the first and second shift of the story. In Experiment 2, emotional flow correlated with the absolute score of the first and second sadness shift, and with the absolute score of the second (but not the first) happiness shift.

Across both experiments and in support of Hypothesis 5, we found significant indirect effects of the story versions on transportation via the first and second happiness shifts, indicating that a decrease, followed by an increase of happiness (as implied by the shifting story version) positively affected transportation. Of note, we found that an increase of happiness from exposition to complication (induced by the positive story version) also increased transportation in both experiments, as indicated by significant indirect effects through the first happiness shift. However, sadness shifts did not emerge as significant mediators in either of the experiments, contrary to what we expected in Hypothesis 6. This suggests that increases of happiness in particular may be considered drivers of transportation. Stories that shift between positive and negative may be best suited to reinforce transportation

[8] These results are further in line with a study by Alam and So (2020), which was published after the empirical part of our project was completed.

throughout a narrative because they enable stronger and more frequent increases of happiness compared to stories with an overall positive trajectory. Temporary decreases of happiness in response to negative story events may enhance the experience of happiness once the story takes a turn for the better, whereas the happiness experienced in response to exclusively positive story events may reach a plateau after a while. This finding ties in with previous research conducted by Clayton et al. (2021), who found that an increase of positive emotion after a negative-to-positive shift in the emotional arc of a story was associated with increased cognitive resources allocated to the story. The fact that shifts in happiness, but not in sadness, emerged as mediators, may further be explained by the discrete adaptive functions associated with these emotions. Sadness has been linked to slower, more systematic information processing, motivating inward orientedness and contemplation (Izard & Ackermann, 2000; Lazarus, 1991), which may be at odds with the process of transportation.

With regard to the effects of the shifting versus positive story versions on general emotional flow, we found mixed results in the two experiments. Whereas in Experiment 1, emotional flow scores were significantly higher for readers of the shifting story version than the positive story version, we found no such difference in Experiment 2. A possible reason for this may be the different strategies used in the two experiments to manipulate the complication parts of the stories. In Experiment 1, the negative event in the shifting story version was matched with an equivalent positive event in the positive story version, whereas in Experiment 2, we manipulated only the protagonist's appraisal of the same event. In Experiment 2, the complication was longer and more complex than in Experiment 1, which featured only a short phone call where either positive or negative news was delivered. In Experiment 2, the middle part of the story also described some childhood memories, reflection on the side of the protagonist, and his outlook on life. Even though in the positive version of the story the protagonist's assessment of the situation was entirely optimistic, this story part may have provided more opportunity for listeners to experience a variety of

different emotions compared to the positive story version of Experiment 1. This may have diminished the effect of story versions on overall emotional flow and explain why emotional flow differed between story versions in Experiment 1, but not in Experiment 2.

Two additional contributions of this work deserve mentioning. First, we developed a self-report scale to measure emotional flow. A pilot study and the results of the present experiments corroborate good psychometric properties of the scale and point at its usefulness for future research. Second, our research is one of the rare cases in which predictions derived from transportation theory were examined with the help of audio-only stories (presented by a professional narrator). Audio stories in the form of podcasts or audiobooks are a highly popular format (Have & Pedersen, 2015; Thorp, 2020). We assumed that the theory and results that had focused on written (and audiovisual) stories apply to audio stories as well. We believe that our experiments are a point in case. Still, more research on audio stories is warranted to corroborate this assumption.

Limitations and Future Directions

We did not observe a main effect of the different story versions on transportation as postulated in Hypothesis 1. This may be attributable to the fact that the positive story versions also induced increases of happiness (in Experiment 1: from exposition to complication, in Experiment 2: from complication to resolution), which may have contributed towards transportation in the positive story conditions. If transportation is driven by increases in happiness in particular, the advantage of stories with a shifting emotional arc over stories with a positive-only trajectory should become more apparent when narratives representing multiple negative-to-positive shifts (rather than only one, as in the present experiments) are examined. We encourage future research to investigate the effects of emotional shifts on transportation using stories depicting multiple shifts from negative to positive.

Moreover, a story with positive events throughout (versus stories with a turn of events) may elicit processes other than emotional shifts that may – independently of the latter –

contribute to higher transportation. Future research is encouraged to focus on stories that largely suspend conflicts or obstacles, providing a rather consistent row of positive events, and how these stories maintain transportation – at least for some participants. On a related note, we wish to point out that the creation of meaningful control conditions is a considerable challenge for researchers interested in the effects of emotional shifts in narrative processing. This involves the manipulation of stories that differ with regard to their emotional arcs but are comparable with regard to other relevant and possibly confounding parameters (e.g., length, complexity, or morale of the story for studies in narrative persuasion).

Measuring emotions as they occur is a methodological challenge, which is a likely reason that dynamic responses to stories have rarely been examined empirically. Both the happiness and sadness measure and the emotional flow scale were administered after the story had ended. This secured that the self-reports did not disrupt or guide the experience itself. The time of assessment, however, opens up the possibility that participants' memories of their experiential states were imperfect, thereby introducing error variance.

On a related note, some evidence points towards the dynamic nature of transportation – it is likely that transportation fluctuates between states of higher and lower transportation while following a narrative (Bezdek & Gerrig, 2017; Tchernev et al., 2021) whereas the standard measure of transportation – Green and Brock's Transportation Scale (and the TS-SF we used) – asks about a holistic experience for the story as a whole. Our aim was to examine how emotional shifts affect this holistic state of transportation for the story as a whole. This notwithstanding, future research is encouraged to explore the relationship between emotional shifts and transportation using continuous measures of transportation.

Finally, our story in the experimental condition involved an exposition, a middle with a complication, and a happy ending, reflecting the common *man in a hole* story structure (Reagan et al., 2016). We believe it is worthwhile for future research to extend the empirical

focus to other story structures, such as structures with several negative shifts (*tragedy*) or the rise and fall of a protagonist.

Conclusion

The present research supports and refines the assumption that emotional shifts experienced in response to a story facilitate transportation. The results of two experiments suggest that positive shifts of happiness in particular may drive transportation. Although stories with an exclusively positive narrative arc may also induce increases of happiness to a certain extent, narratives with trajectories shifting from negative to positive may be better suited to enable both stronger as well as repeated positive happiness shifts throughout the story, maintaining higher levels of transportation over time.

Data availability statement

The data and codes underlying this manuscript are available at https://osf.io/y7dv8/?view_only=88f3d6e1034b4fe3bf42988954f73cb2.

References

Alam, N., & So, J. (2020). Contributions of emotional flow in narrative persuasion: An empirical test of the emotional flow framework. *Communication Quarterly*, *68*(2), 161–182. https://doi.org/10.1080/01463373.2020.1725079

Abbott, H. P. (2002). *The Cambridge introduction to narrative.* Cambridge University Press.

Appel, M., Gnambs, T., & Maio, G. (2012). A short measure of the need for affect. *Journal of Personality Assessment, 94*, 418-426. doi: 10.1080/00223891.2012.666921

Appel, M., Gnambs, T., Richter, T., & Green, M. C. (2015). The transportation scale–short form (TS–SF). *Media Psychology, 18*, 243-266. doi:10.1080/15213269.2014.987400

Appel, M., & Richter, T. (2010). Transportation and need for affect in narrative persuasion: A mediated moderation model. *Media Psychology*, *13*(2), 101–135. https://doi.org/10.1080/15213261003799847

Appel, M., Schreiner, C., Isberner, M.-B., & Richter, T. (2019). The mediating role of event-congruent emotions in narrative persuasion. *Poetics, 77,* 101385. https://doi.org/10.1016/j.poetic.2019.101385

Aristotle. (1994). Poetics (S. H. Butcher, Trans.). The Internet Classics Archive. http://classics.mit.edu/Aristotle/poetics.html (Original work published ca. 350 B.C.E.)

Bal, P. M., & Veltkamp, M. (2013). How does fiction reading influence empathy? An experimental investigation on the role of emotional transportation. *PLoS ONE*, *8*(1), e55341. https://doi.org/10.1371/journal.pone.0055341

Barnes, J. L. (2018). Imaginary engagement, real-world effects: fiction, emotion, and social cognition. *Review of General Psychology*, *22*(2), 125–134. https://doi.org/10.1037/gpr0000124

Bezdek, M. A., Gerrig, R. J., Wenzel, W. G., Shin, J., Pirog Revill, K., & Schumacher, E. H. (2015). Neural evidence that suspense narrows attentional focus. *Neuroscience*, *303*, 338–345. https://doi.org/10.1016/j.neuroscience.2015.06.055

Bezdek, M. A., & Gerrig, R. J. (2017). When narrative transportation narrows attention: Changes in attentional focus during suspenseful film viewing. *Media Psychology, 20*(1), 60–89. https://doi.org/10.1080/15213269.2015.1121830

Bilandzic, H., & Busselle, R. W. (2008). Transportation and transportability in the cultivation of genre-consistent attitudes and estimates. *Journal of Communication*, *58*(3), 508–529. https://doi.org/10.1111/j.1460-2466.2008.00397.x

Boyd, R. L., Blackburn, K. G., & Pennebaker, J. W. (2020). The narrative arc: Revealing core narrative structures through text analysis. *Science Advances*, *6*(32), 1–10. https://doi.org/10.1126/sciadv.aba2196

Busselle, R. & Bilandzic, H. (2008). Fictionality and perceived realism in experiencing stories: A model of narrative comprehension and engagement. *Communication Theory, 18*, 255–280. doi:10.1111/j.1468-2885.2008.00322.x

Carrera, P., Caballero, A., & Muñoz, D. (2008). Comparing the effects of negative and mixed emotional messages on predicted occasional excessive drinking. *Substance Abuse: Research and Treatment, 1.* https://doi.org/10.1177/117822180800100001

Carrera, P., Muñoz, D., & Caballero, A. (2010). Mixed emotional appeals in emotional and danger control processes. *Health Communication, 25*(8), 726–736. https://doi.org/10.1080/10410236.2010.521914

Clayton, R. B., Raney, A. A., Oliver, M. B., Neumann, D., Janicke-Bowles, S. H., & Dale, K. R. (2021). Feeling transcendent? Measuring psychophysiological responses to self-transcendent media content. *Media Psychology*, *24*(3), 359–384. https://doi.org/10.1080/15213269.2019.1700135

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Lawrence Erlbaum.

Dahlstrom, M. F. (2014). Using narratives and storytelling to communicate science with nonexpert audiences. *Proceedings of the National Academy of Sciences of the United States of America*, *111*, 13614–13620. https://doi.org/10.1073/pnas.1320645111

de Graaf, A., & Hustinx, L. (2011). The effect of story structure on emotion, transportation, and persuasion. *Information Design Journal*, *19*(2), 142–154. https://doi.org/10.1075/idj.19.2.05gra

del Vecchio, M., Kharlamov, A., Parry, G., & Pogrebna, G. (2021). Improving productivity in Hollywood with data science: Using emotional arcs of movies to drive product and service innovation in entertainment industries. *Journal of the Operational Research Society*, *72*(5), 1110–1137. https://doi.org/10.1080/01605682.2019.1705194

Diedenhofen, B., & Musch, J. (2015). cocor: A comprehensive solution for the statistical comparison of correlations. *PLoS ONE, 10*(4), e0121945. https://doi.org/10.1371/journal.pone.0121945

Faul, F., Erdfelder, E., Buchner, A., & Lang, A. G. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods, 41*(4), 1149-1160.

Freytag, G. (1863). *Die Technik des Dramas [Technique of the drama]*. Hirzel.

Gerrig, R. J. (1993). *Experiencing narrative worlds. On the psychological activities of reading.* New Haven: Yale University Press.

Gottschall, J. (2013). *The storytelling animal: How stories make us human.* Mariner Books.

Green, M., Bilandzic, H., Fitzgerald, K., & Paravati, E. (2020). Narrative effects. In M. B. Oliver, A. A. Raney, & J. Bryant (Eds.), *Media effects: Advances in theory and research* (pp. 130–145). Routledge. https://doi.org/10.4324/9780429491146-9

Green, M. C., & Brock, T. C. (2000). The role of transportation in the persuasiveness of public narratives. *Journal of Personality and Social Psychology, 79*, 701-721. doi:10.1037/0022-3514.79.5.701

Guido, G., Pichierri, M., & Pino, G. (2018). Place the good after the bad: effects of emotional shifts on consumer memory. *Marketing Letters*, *29*(1), 49–60. https://doi.org/10.1007/s11002-017-9439-0

Hakemulder, F., Kuijpers, M. M., Tan, Ed, Balint, K. E. & Doicaru, M. (Eds.). (2017). *Narrative absorption*. John Benjamins.

Hamby, A., & Brinberg, D. (2016). Happily ever after: How ending valence influences narrative persuasion in cautionary stories. *Journal of Advertising*, *45*(4), 498–508. https://doi.org/10.1080/00913367.2016.1262302

Have, I., & Pedersen, B. S. (2015). *Digital audiobooks: New media, users, and experiences*. Routledge.

Hayes, A. F. (2018). *Introduction to mediation, moderation, and conditional process analysis. A regression based approach* (2nd ed.). Guilford Press.

Johnson, D. R. (2012). Transportation into a story increases empathy, prosocial behavior, and perceptual bias toward fearful expressions. *Personality and Individual Differences*, *52*(2), 150–155. https://doi.org/10.1016/j.paid.2011.10.005

Kreuter, M. W., Green, M. C., Cappella, J. N., Slater, M. D., Wise, M. E., Storey, D., Clark, E. M., O'Keefe, D. J., Erwin, D. O., Holmes, K., Hinyard, L. J., Houston, T., & Woolley, S. (2007). Narrative communication in cancer prevention and control: A framework to guide research and application. *Annals of Behavioral Medicine*, *33*(3), 221–235. https://doi.org/10.1007/BF02879904

Lang, A. (2000). The limited capacity model of mediated message processing. *Journal of Communication*, *50*(1), 46–70. https://doi.org/10.1111/j.1460-2466.2000.tb02833.x

Lang, A. (2017). Limited capacity model of motivated mediated message processing (LC4MP). In P. Rössler, C.A. Hoffner, & L. Zoonen (Eds.), *The international encyclopedia of media effects*. Wiley. https://doi.org/10.1002/9781118783764.wbieme0077

Lang, A., Sanders-Jackson, A., Wang, Z., & Rubenking, B. (2013). Motivated message processing: How motivational activation influences resource allocation, encoding, and storage of TV messages. *Motivation and Emotion*, *37*(3), 508–517. https://doi.org/10.1007/s11031-012-9329-y

Lee, S., & Potter, R. F. (2020). The impact of emotional words on listeners' emotional and cognitive responses in the context of advertisements. *Communication Research*, *47*(8), 1155–1180. https://doi.org/10.1177/0093650218765523

Meng, X.-L., Rosenthal, R., & Rubin, D. B. (1992). Comparing correlated correlation coefficients. *Psychological Bulletin, 111*(1), 172–175. https://doi.org/10.1037/0033-2909.111.1.172

Moyer-Gusé, E. (2008). Toward a theory of entertainment persuasion: Explaining the persuasive effects of entertainment-education messages. *Communication Theory, 18*, 407-425. https://doi.org/10.1111/j.1468-2885.2008.00328.x

Nabi, R. L. (2015). Emotional flow in persuasive health messages. Health *Communication, 30*(2), 114–124. https://doi.org/10.1080/10410236.2014.974129

Nabi, R. L. & Green, M. C. (2015). The role of a narrative's emotional flow in promoting persuasive outcomes. *Media Psychology, 18*, 137–162. https://doi.org/10.1080/15213269.2014.912585

Oliver, M. B., & Bartsch, A. (2010). Appreciation as audience response: exploring entertainment gratifications beyond hedonism. *Human Communication Research*, *36*(1), 53–81. https://doi.org/10.1111/j.1468-2958.2009.01368.x

Reagan, A. J., Mitchell, L., Kiley, D., Danforth, C. M., & Dodds, P. S. (2016). The emotional arcs of stories are dominated by six basic shapes. *EPJ Data Science*, *5*, Article 31. https://doi.org/10.1140/epjds/s13688-016-0093-1

Ross, W. T., & Simonson, I. (1991). Evaluations of pairs of experiences: A preference for happy endings. *Journal of Behavioral Decision Making*, *4*(4), 273–282. https://doi.org/10.1002/bdm.3960040405

Slater, M. D., & Rouner, D. (2002). Entertainment-education and elaboration likelihood: Understanding the processing of narrative persuasion. *Communication Theory, 12,* 173-191. https://doi.org/10.1093/ct/12.2.173

Tchernev, J. M., Collier, J., & Wang, Z. (2021). There and back again? Exploring the real-time cognitive journey of narrative transportation. Communication Research. https://doi.org/10.1177/00936502211018577

Thorp, C. (2020, January 6). Audiobooks: The rise and rise of the books you don't read. Retrieved from https://www.bbc.com/culture/article/20200104-audiobooks-the-rise-and-rise-of-the-books-you-dont-read.

Tukachinsky, R., & Tokunaga, R. (2013). The effects of engagement with entertainment. *Annals of the International Communication Association*, *37*(1), 287–322. https://doi.org/10.1080/23808985.2013.11679153

van de Vijver, F. J., & Leung, K. (1997). *Methods and data analysis for cross-cultural research.* Sage.

van Laer, T., de Ruyter, K., Visconti, L. M., & Wetzels, M. (2014). The extended transportation-imagery model: A meta-analysis of the antecedents and consequences of consumers' narrative transportation. *Journal of Consumer Research, 40*(5), 797–817. https://doi.org/10.1086/673383

Zillmann, D. (1983). Transfer of excitation in emotional behavior. In J. T. Cacioppo & R. E. Petty (Eds.), *Social psychophysiology: A sourcebook* (pp. 215-240). Guilford Press.

Zillmann, D. (1991). The logic of suspense and mystery. In J. Bryant & D. Zillmann (Eds.), *Responding to the screen: Reception and reaction processes* (pp. 281–304). Erlbaum.

Zillmann, D. (1996). The psychology of suspense in dramatic exposition. In P. Vorderer, H. J. Wulff, & M. Friedrichsen (Eds.), *Suspense: Conceptualizations, theoretical analyses, and empirical explorations* (pp. 199–231). Erlbaum.

Appendix

Table A1. Emotional Flow Scale

Item No.	Original German Version	English Translation
1	Die Geschichte hat mich emotional durchgerüttelt.	The story shook me emotionally.
2	Während ich die Geschichte verfolgte, habe ich nacheinander unterschiedliche Gefühle empfunden.	As I followed the story, I experienced a series of different emotions.
3	Die Geschichte hat mich auf eine emotionale Achterbahnfahrt mitgenommen.	The story took me on an emotional rollercoaster.
4[#]	Die Geschichte zu hören war ein ständiges emotionales Auf und Ab für mich.	Listening to the story was a constant emotional up and down for me.
5	Die Geschichte war ein Wechselbad der Gefühle für mich.	The story was an ever-changing mix of emotions for me.
6[#]	Beim Anhören der Geschichte habe ich wechselnde Gefühle erlebt.	While listening to the story, I experienced changing emotions.
7	Mit dem Verlauf der Geschichte haben sich auch meine Gefühle verändert.	As the story progressed, my emotions changed.
8*	Egal was in der Geschichte passierte, ich habe überwiegend dasselbe dabei empfunden.	No matter what was happening in the story, I felt mainly the same way throughout.
9*[#]	Beim Anhören der Geschichte habe ich gleichbleibende Gefühle erlebt.	While listening to the story, I experienced consistent emotions.

Note. Items were presented with response scales from 1 (not at all) to 7 (very much). The scale was translated to English using the committee method (van de Vijver & Leung, 1997): Three native speakers of the original language highly proficient in the target language translated the items independently. Then, they compared translations to develop a draft, which was verified by a native speaker in the target language.

* Items were reverse coded. [#] Wording needs to reflect mode of presentation

Online Supplement for the Manuscript

Story structure and narrative transportation

S1 Emotional Flow Self-Report Scale – Pilot Study

Overview

To test the Emotional Flow Self-Report Scale, a pilot study was conducted. The study followed an experimental design and comprised measures of theoretically related (but conceptually distinct) constructs *suspense* and *appreciation* to gain first insight into the measure's convergent validity. Fun was examined to test its divergent validity. In addition to testing scale validity, these relationships appeared to be a valuable addition to emotional flow theory.

Suspense is an experience in response to narrative events that signify a possible negative outcome for a protagonist. As the story progresses, audiences are likely to shift between hope (for a positive outcome) and fear (for a negative outcome, Zillmann, 1991; see also Nabi & Green, 2015). Therefore, we expected the experience of suspense to be closely related to emotional flow.

Appreciation refers to eudaimonic entertainment experiences, which are often perceived as poignant, moving, and meaningful, and are characterized by mixed affect (Oliver & Bartsch, 2010). Both concepts describe experiences in response to narratives and entertainment that are characterized by multiple emotions: Whereas the co-occurrence of emotions (of opposing valence) is characteristic of appreciation, emotional flow describes the successive evolution of emotional responses. Appreciation may be part of an experience characterized by emotional flow (Clayton et al., 2019), therefore, we expected positive correlations of emotional flow with the experience of appreciation.

By contrast, emotional flow should show weaker or no association with *fun*, which is primarily characterized by the experience of positive emotion. Contrary to appreciation and suspense, the experience of multiple or shifting emotions is not inherent to fun.

Lastly, emotional flow should be closely associated with changes in self-reported *intensity ratings of discrete emotions* that are relevant to the narrative.

Method

To test these assumptions, we conducted a two group (short story with emotional arc: positive-to-negative vs. negative-to-positive) between subjects experiment.[9] Our main goal was to examine the relationships between our emotional flow measure and related measures of entertainment experiences (appreciation, suspense, fun), as well as with changes in emotion ratings.

We collected data from a total of 154 participants via a web-based experiment. Sixteen cases were excluded from the analysis because of incomplete answers (1 case), response times indicating a long pause during stimulus presentation (5 cases), self-reported low (< 4) attention paid during stimulus presentation (7 cases), and too fast response times (3 cases). The final sample consisted of 138 cases.

Participants were randomly assigned to the experimental conditions and viewed one of the two stimulus videos. The stimulus videos represented stories with different emotional trajectories. One story revolved around two siblings growing up in difficult family conditions and ending up in different foster families. The sister misses her brother badly, but in the end, both are reunited (emotional arc from negative to positive). The second video tells the story of a promising football talent who becomes permanently paralyzed after a tragic car accident (emotional arc from positive to negative). After the video, participants rated their experience of emotional flow, appreciation (three items, Oliver & Bartsch, 2010, $\alpha = .76$ across both story conditions), fun (three items, Oliver & Bartsch, 2010, $\alpha = .83$ across both story conditions), and suspense (three items by Oliver & Bartsch, 2010, plus one additional item

[9] In addition, the experiment included a spoiler manipulation (between-subjects factor, the stimulus video was preceded by information about the story containing a spoiler, i.e., information revealing a turn of events in the story, or no spoiler). This manipulation was intended to test predictions regarding spoiler effects which do not concern the validity of the emotional flow scale and thus are not reported here. However, it is unclear whether the manipulation was successful, because the questionnaire did not include a manipulation check. It is possible that this manipulation was too subtle and was overlooked by some participants. Because there was no significant main effect of the spoiler manipulation on emotional flow, $F(1,134) = 0.73$, $p = .395$, $\eta^2 = .01$, and no significant interaction between the spoiler and the story condition, $F(1,134) = 0.30$, $p = .586$, $\eta^2 = .00$, we collapsed the spoiler/no spoiler groups for the analyses reported here.

suggested by Schneider et al., 2017, α = .75 across both story conditions). After that, we asked participants to rate the intensity of emotions experienced before (T1) and after (T2) the trajectory shift in the story, using a list of seven discrete emotions (happiness, sadness, anger, fear, disgust, surprise, relief).

Results and Discussion

For the video with a negative-to-positive emotional arc, the emotional flow measure showed excellent internal consistency (Cronbach's α = .92). Internal consistency for the video with a positive-to-negative trajectory was good (α = .82). All of the items' corrected item-total correlations ranged between .519 and .858 in the condition with the negative-to-positive story and between .416 and .653 in the group with the positive-to-negative story.

As expected, the emotional flow measure correlated with suspense and appreciation, but not with fun for both stories (Table S1a). We tested the difference between emotional flow correlations with fun and appreciation or suspense for significance using the R-package *cocor* (Diedenhofen & Musch, 2015) and the test procedure by Meng et al. (1992). The difference between correlations of emotional flow with fun and suspense was significant for both stories (negative-to-positive: $z = -2.04$, $p = .042$; positive-to-negative: $z = -3.32$, $p < .001$). The difference between correlations of emotional flow with fun and appreciation was significant for the story with a positive-to-negative trajectory, $z = -3.66$, $p < .001$, but not for the negative-to-positive story, $z = -1.42$, $p = .158$

We further explored the relationship of emotional flow with the absolute difference scores of emotion ratings between the two story parts (i.e., the intensity to which each emotion rating changed, regardless of direction). For the story with the negative-to-positive trajectory, emotional flow was significantly and positively associated with absolute difference scores of happiness, fear, relief, and surprise. For the story with the positive-to-negative arc, emotional flow was significantly and positively associated with absolute difference scores of happiness, sadness, fear, and anger (see Table S1b).

Table S1a

Zero-order correlations of emotional flow with entertainment experiences

	1	2	3	4
1. Emotional flow	-	.417 (<.001)	.365 (.003)	.159 (.201)
2. Suspense	.381 (<.001)	-	.548 (<.001)	.431 (<.001)
3. Appreciation	.521 (<.001)	.424 (<.001)	-	.257 (.037)
4. Fun	-.077 (.521)	.320 (.006)	-.036 (.766)	-

Note. Results for the negative-to-positive story arc (n = 66) are displayed above the diagonal, for the positive-to-negative story arc (n = 72) below the diagonal. Correlation p-values in brackets.

Table S1b

Descriptive values and Pearson correlations of emotional shifts with emotional flow

	Negative-to-positive story (n = 66)				Positive-to-negative story (n = 72)			
	M	*SD*	*r*	*p*	*M*	*SD*	*r*	*p*
Happiness shift	4.42	1.46	.441	<.000	3.64	1.87	.356	.002
Sadness shift	3.18	1.92	.219	.078	4.04	1.70	.389	<.001
Fear shift	2.06	1.64	.362	.003	2.26	2.00	.383	<.001
Relief shift	4.11	1.53	.458	<.001	2.50	2.07	.215	.070
Anger shift	4.20	1.68	.240	.052	3.61	2.06	.434	<.001
Disgust shift	3.26	1.88	.079	.527	0.92	1.60	.215	.070
Surprise shift	2.36	1.79	.361	.003	1.88	1.38	.037	.756

Note. Shift variables represent absolute values of difference scores of emotion ratings between the two story parts.

To conclude, this pilot study offers results that support the reliability and construct validity of the emotional flow measure. Emotional flow predominantly correlated with conceptually more closely related experiences (suspense, appreciation) more strongly than with fun. Furthermore, emotional flow was related to the degree to which the intensity ratings of both positive and negative emotions changed between story parts.

S2 Additional Information Regarding the Procedure of the Laboratory Experiments

The data for this study were collected as part of a larger, partly exploratory project that included an assessment of various physiological measures as well as video recordings for the purpose of facial expression analyses. We focus on describing the parts of the procedure that are relevant for the measures of interest in the manuscript, however, for transparency reasons and to provide additional context, we describe the full procedure in the following.

About two weeks prior to the main experiment, participants completed an online survey that assessed their need for affect, story-relevant attitudes, attitudes regarding some issues unrelated to the experimental stories as filler items, as well as some screening criteria (language proficiency and some criteria relevant to the assessment of physiological measures, e.g., pregnancy, presence of affective disorders, known medical conditions affecting the interpretability of physiological measures). If participants fit the screening criteria, they were invited to schedule an appointment for the main part of the experiment, taking place in one of two laboratories. Subjects participated for course credit or a monetary incentive, respectively. In Experiment 1, 17.51 days (SD = 8.14) passed between the online survey and the laboratory session on average, in Experiment 2, 18.56 days (SD = 8.98). Participants entered the lab individually. After giving their informed consent, the experimenter applied a respiration belt as well as electrodes to the palms and chest of the participant for the physiological data collected in this experiment (respiration, electrodermal and cardiac activity). Participants first answered a short questionnaire that assessed sociodemographic data and details relevant to the physiological measures employed in this study, including questions concerning participants' physical activity, substance use, use of medication, and wellbeing. After a short pause that allowed the experimenter to check for possible signal loss, baselines relevant to the physiological data were assessed: a paced-breathing task (2:15 min), resting baseline (3 min), and vanilla baseline (listening to an expository text about apples, ca. 3 min). In addition, subjects were instructed to take a photograph of their neutral face using the web camera

installed above the computer. Then, participants listened to the story via headphones. Their facial expressions during the story were recorded for the purpose of facial expression analyses. In order to keep subjects' gaze on the screen while listening to the narrative and ensure that the video recordings are analyzable, the audio of the narrative was accompanied by an animation of the sound waves. Participants were prompted to rate their valence and arousal immediately after each baseline task and the story. Then, they answered the transportation questionnaire. After, they were presented with a brief summary of the three story parts and were asked to rate their emotional experience during each part of the story. This was followed by a questionnaire to assess the general experience of emotional shifts during the course of the narrative, and the assessment of story-related attitudes. Finally, participants were debriefed and compensated.

S3 Stimulus Material And Cues for Emotion Ratings per Story Part (Experiment 1)

Robot Story (German Version)

Exposition (positive, 766 words)

Für Maria Goldmann trat die Bescherung schon Anfang Dezember ein, mit dem Anruf ihrer Tochter Johanna: Sie und ihr Mann Robert würden aus Amerika nach Deutschland fliegen, um Weihnachten bei Maria zu verbringen. Seit ihrer Hochzeit vor vier Jahren lebte Johanna bei ihrem Mann in Kalifornien und hatte ihre Mutter nur selten besuchen können – in diesem Jahr noch gar nicht; Roberts Vater hatte eine Herzoperation hinter sich, Johanna hatte Robert nicht allein lassen wollen. „Aber Roberts Dad geht‘s besser“, erklärte Johanna ihr. „Wir kommen also – Emma auch.“
„Ach, Liebes“, sagte Maria und lächelte. „Schön!“ Emma war Marias Enkelin und Maria würde sie das erste Mal sehen.
Endlich, dachte Maria, nachdem sie aufgelegt hatte, klatschte in die Hände und sah sich fröhlich summend in ihrer Wohnung um. Nun wirkte die Wohnung, in der sie seit einigen Jahren nur noch alleine lebte, weniger verlassen. Voller Energie steckte sich die kleine 75-Jährige die Brille ins graue Haar, lief im Wohnzimmer umher und plante den Weihnachtsabend. „Hierhin kommt der Weihnachtsbaum“, murmelte sie vor sich hin, „und dort drüben …“
Erst ein „Morgen, Frau Goldmann“ riss sie aus ihren Überlegungen. Maria drehte sich zu der lächelnden Frau, die sie vor lauter Weihnachtsplänen gar nicht hatte die Tür aufschließen und reinkommen hören.
„Oh, hallo Sophie.“ Maria folgte ihr in der Küche, in der Sophie schon zugange war.
„Sie sind ja so gut gelaunt heute, Frau Goldmann,“ sagte Sophie, während sie vor Maria auf dem Küchentisch zwei Tassen dampfenden Tee stellte und sich hinsetzte. Maria setzte gerade an, von ihrem anstehenden Weihnachtsbesuch zu erzählen, aber etwas ließ sie stutzen. Sophie besuchte sie als Pflegekraft alle drei Tage, um ihre Vitalwerte zu überprüfen und Hausarbeit zu übernehmen, die Maria nicht mehr allein schaffte. Doch nun: Keine Messgeräte, keine Formulare, aber dafür Zeit für Tee. „Nanu?“, sagte Maria.
„Dachte, Sie merken es nie,“ kicherte Sophie, stand auf und ging zum Eingangsbereich der Wohnung. Als sie zurückkehrte, setzte Maria verwundert ihre Brille auf. „Was ist denn das?“, fragte sie und deutete auf das weiße, hüfthohe Etwas, das hinter Sophie in die Küche gerollt kam. Es sah aus wie ein kleiner Schneemann, mit großen Augen und einem freundlich lächelnden Mund. Auf der Brust hatte er einen kleinen runden Bildschirm.
„Sagt er Ihnen selbst. Nicht erschrecken“, sagte Sophie und, an das Schneemännchen gewandt: „PAL, stell dich Frau Goldmann vor“. Sein Bildschirm leuchtete in einem sanften Blau auf.
„Guten Tag, Frau Goldmann. Ich bin PAL, ihr Pflege-Assistenz-Leister. Ich bin hier, um Ihnen und Sophie zu helfen. Es freut mich, Sie kennenzulernen.“
Maria guckte verdattert.
„Ist ein Roboter, hilft mir bei der Arbeit“, erklärte Sophie auf Marias fragenden Blick hin und sagte: „Ich zeige es Ihnen. Wir wollen die Werte messen, PAL.“ Aus einer Klappe in dem Schneemännchen öffnete sich eine Schublade mit einer Fingermanschette, die mit PAL durch ein Kabel verbunden war. „Ist zwar nur eine Testphase“, erklärte Sophie, „aber bis jetzt: top.

Ich nehme ihn zu jedem Patienten mit und er nimmt mir den ganzen Bürokram ab. Hab dadurch mehr Zeit für die Leute."
„Frau Goldmann", sagte PAL, „Ich würde jetzt mit den Messungen beginnen."
Eine Weile geschah nichts, bis Sophie meinte: „Er wartet auf Ihr Okay."
„Oh", sagte Maria eilig. „In Ordnung PAL."
„Ausgezeichnet", entgegnete PAL. „Bitte wickeln Sie die Manschette um Ihren Zeigefinger, um den Blutdruck zu messen."
Maria tat wie ihr geheißen. Leise begann der kleine Roboter zu summen, die runde Fläche wechselte von Blau zu Weiß. „Messung abgeschlossen. – Blutdruck", sagte PAL und die runde Fläche färbte sich grün. „Ausgezeichnet. Sauerstoffsättigung. Ausgezeichnet. Puls" – die Fläche wurde orange – „leicht erhöht."
„Nun", sagte Maria. „Vielleicht, weil ich etwas aufgeregt bin."
„Verständlich, Frau Goldmann", sagte PAL. „Aber Sie werden sehen, dass ich hier bin, um zu helfen."
Maria überlegte. „Nun, scheint so. Und ein bisschen süß ist er ja."
„Danke", sagte PAL und seine Fläche färbte sich rosa.
***
Eine Woche vor Weihnachten packte Maria gemeinsam mit Sophie die Geschenke für alle ein. Für die kleine Emma hatte sie eine Mütze gestrickt. Außerdem hatte sie es sich nicht verkneifen können, ihr noch einen Stoffelefanten zu kaufen, auch wenn sie wusste, dass kleine Kinder für gewöhnlich genug Stofftiere bekamen. Von der Oma hatte sie eben noch keinen. Es war ein herrlicher Tag: Sophie hatte selbstgebackene Plätzchen mitgebracht und brachte Maria immer wieder zum Lachen, indem sie PAL Weihnachtslieder singen ließ.
Gerade als Sophie mit PAL die Wohnung verlassen und die Tür hinter sich zugezogen hatte, klingelte das Telefon. „Hallo Mama! Alles in Ordnung bei dir?"
„Johanna, Liebes!", rief Maria, als sie die vertraute Stimme hörte. „Mir geht's ganz fabelhaft. Eben habe ich die Geschenke eingepackt. Wie geht es dir?"

Complication (241 words)

Negative turn of events

„Ach Mama", seufzte Johanna – und am Klang ihrer Stimme merkte Maria, dass etwas nicht stimmte; Marias Lächeln verschwand und die Sorgen kamen. „Roberts Dad geht es wieder schlecht", sagte Johanna mit kontrollierter Stimme, fast so, als stünde sie kurz vor einem Weinkrampf. „Roberts Mum meint, sie brauchen uns hier."
„Oh, nein, Liebes", sagte Maria und hielt sich die Hand vor dem Mund. „Das tut mir furchtbar leid."

Positive event

„Alles bestens, Mama. Roberts Papa ist glücklicherweise wieder ganz fit. Sie entlassen ihn rechtzeitig zu Weihnachten aus dem Krankenhaus", erzählte Johanna. „Jetzt können wir entspannt in die Feiertage starten – naja, so entspannt wie Weihnachtsfeiertage eben sein können." Sie lachte. „Ich freue mich so. Endlich mal wieder ein Weihnachten in der Heimat."
„Ich kann es auch kaum erwarten", sagte Maria mit einem Blick auf den glänzenden Geschenkestapel, den Sophie auf dem Küchentisch angerichtet hatte. „Vor allem,

„Mir auch, Mama. Das mit Weihnachten wird dieses Jahr also nichts ... Bitte sei nicht böse."
Nun musste Maria ihre Stimme und Gefühle unter Kontrolle halten. Auf einmal verpufften die ganze Freude und ihre Energie der vergangenen Tage – jetzt: nur noch Leere. „Ach, Johanna", sagte sie bemüht gefasst, „schon in Ordnung". Sie atmete tief durch, um ihr Zittern zu beruhigen. „Sag Robert, dass ich das Beste für seinen Vater hoffe."
Geistesabwesend blickte Maria umher. Ihr Blick fiel auf den glänzenden Geschenkestapel, den Sophie soeben auf dem Küchentisch angerichtet hatte. „Ach die Geschenke …", sagte sie, „ich schicke sie euch einfach, ja?"
„Ach Mama, das musst du doch nicht, bitte, ist schon gut …"
„Nein, Liebes, ich schicke sie", sagte sie und versuchte, entschlossen und stark zu klingen.
„Wie du möchtest, Mama. Danke." Lange, nachdem sie aufgelegt hatten, konnte Maria sich nicht bewegen und starrte nur ins Leere, bis ihr auffiel, dass sie noch den Telefonhörer in der Hand hielt. Als sie es mit einem Piepen zurück in die Ladestation stellte, konnte sie endlich weinen.

dass ich die kleine Emma endlich einmal halten kann. Wie geht es ihr?"
„Wunderbar. Sie ist gerade eingeschlafen. Sie ist zum Glück sehr pflegeleicht, was das angeht. Ich bin mal gespannt, wie der Flug wird. Naja, Mama, wir kommen am Dreiundzwanzigsten am frühen Nachmittag – wir bringen dann von unterwegs gleich einen Baum mit! Du hast doch noch keinen besorgt, oder?"
„Nein, Liebes, du weißt doch, dass ich mit sowas traditionell spät dran bin."
Johanna lachte. „Gut. Wir schmücken dann zusammen!"
In den letzten Jahren, die die Maria Weihnachten hatte allein verbringen müssen, war es ihr in der Weihnachtszeit nicht mehr so gut gegangen wie jetzt. Die Tage zogen sich nicht wie sonst um diese Jahreszeit zäh dahin – nicht nur wegen ihrer Vorfreude auf ihre Tochter und ihre Enkelin. Auch mit Sophie, die sonst immer in Eile war, hatte sich, seit PAL ihr die lästigsten Arbeiten abnahm, ein neues Band entsponnen. Sie hatte Sophie immer geschätzt, aber nun freute sie sich richtig auf jeden Besuch von ihr.

Resolution (positive, 401 words)

Am Morgen des Dreiundzwanzigsten kam Sophie wieder vorbei, ließ PAL Marias Vitalwerte messen und brachte Lichterketten an die Fenster an. „Da habe ich ja glatt noch etwas Zeit", sagte Sophie mit einem Blick auf die Uhr, während sie von der Leiter stieg.
Marias Augen leuchteten auf. „Zeit für einen Kaffee, Sophie?"
„Sehr gerne Frau Goldmann. Es gibt zwar noch etwas Papierkram, aber das erledigt ja nun unser PAL." Sie lächelte und warf PAL einen Blick zu, der in einer Wohnzimmerecke fleißig vor sich hin blinkte.
Maria konnte sich nicht erinnern, dass ein solcher Moment in dem Jahr, das sie Sophie nun kannte, schon einmal vorgekommen wäre. Während sie beisammensaßen, erzählte Sophie von ihrem Weihnachten, dass sie mit ihrer Schwester immer eine Feier veranstaltete, zu der auch Freunde eingeladen waren, ganz anders, als Maria es kannte. „Wir sind immer eine bunte

Runde, jeder bringt etwas zu Essen und zu Trinken mit, Geschenke sind nicht so wichtig. Man weiß nie so recht, was einen erwartet, aber es ist immer ein schönes Fest. Letztes Jahr haben wir sogar meinen griesgrämigen Nachbarn eingeladen – es hat Wunder gewirkt."
Sophie blickte Frau Goldmann einen Moment gedankenverloren an, während sie mit der schnörkeligen Kaffeetasse in ihrer Hand spielte. Dann trank sie die Tasse in einem Zug aus, erhob sich und sagte: „So Frau Goldmann, nun muss ich aber wirklich los, vielen Dank für die nette Pause." Sie lief in den Hausflur, rief „Aufbruch, PAL", und der Roboter kam aus dem Wohnzimmer gerollt.
Im Türrahmen drehte Sophie sich noch einmal um.
„Frohe Weihnachten", sagte Maria.
„Wünsch ich Ihnen auch", erwiderte Sophie, machte aber keine Anstalten zu gehen. Nach etwas Zögern sagte sie: „Wissen Sie Frau Goldmann, ich habe gedacht … kommen Sie doch morgen am Heiligabend zu meiner Feier. Ich würde mich sehr freuen und bisher hat es bei uns jedem gefallen – wir kriegen sicher auch ein Taxi für Sie organisiert. Was sagen Sie?"
Maria stutze und blickte Sophie völlig überrumpelt durch ihre Brille an. „Also Sophie … vielen Dank, aber…" Doch ihr fiel kein „Aber" ein. Eine große Wärme breitete sich in Marias Bauch aus und sie konnte nur mit Mühe ein paar Tränen zurückhalten. „Sophie, das ist … Ja, gerne. Ich werde kommen."
„Wunderbar", sagte Sophie vergnügt, umarmte Maria zum Abschied und machte sich, mit PAL im Schlepptau, auf den Weg. Maria schloss die Türe, lehnte sich dagegen und lächelte. Das würde ein ganz besonderes Weihnachten werden.

Cues for the Emotion Rating

For the assessment of emotion ratings for each story part, the following summaries were presented to participants as a cue:

1. Exposition: Kurz vor Weihnachten: Marias Pflegerin Sophie hat einen neuen Pflege-Assistenzroboter. [Just before Christmas: Maria's nurse Sophie has a new care assistant robot.]
2. Complication: Maria und ihre Tochter telefonieren wegen des anstehenden Weihnachtsbesuchs. [Maria and her daughter talk about the upcoming Christmas visit on the phone.]
3. Resolution: Am Vorabend zu Weihnachten schaut Sophie noch einmal bei Maria vorbei. [The night before Christmas, Sophie checks in with Maria one more time.]

S4 Zero Order Correlations (Experiment 1)

Table S4

Zero-Order Correlations by Group (Experiment 1).

	1	2	3	4	5	6
1. 1st happiness shift*	-	.514 (<.001)	.629 (<.001)	.368 (.007)	.437 (.001)	.459 (.001)
2. 2nd happiness shift*	.333 (.009)	-	.579 (<.001)	.713 (<.001)	.393 (.004)	.331 (.016)
3. 1st sadness shift*	.103 (.433)	.163 (.212)	-	.555 (<.001)	.457 (.001)	.319 (.020)
4. 2nd sadness shift*	.209 (.108)	.187 (.153)	.498 (<.001)	-	.319 (.004)	.279 (.043)
5. Emotional flow	.156 (.235)	.014 (.916)	.407 (<.001)	.525 (<.001)	-	.766 (<.001)
6. Transportation	.193 (.140)	-.156 (.233)	.063 (.632)	.218 (.094)	.502 (<.001)	-

Note. Results for the shift condition (n = 53) are displayed above the diagonal, for the positive condition (n = 60) below the diagonal. Correlation p-values in brackets. *Shift variables (1.-4.) represent absolute values of difference scores of emotion ratings between subsequent story parts (shift 1 = exposition to complication, shift 2 = complication to resolution).

S5 Mediation Analyses (Experiment 1)

Table S5a

Serial Mediation Model for the Effect of Condition on Transportation via Happiness Shifts (Experiment 1)

	Consequent								
Antecedent	M1 (1st happiness shift)			M2 (2nd happiness shift)			Y (Transportation)		
	b	*SE*	95% CI	*b*	*SE*	95% CI	*b*	*SE*	95% CI
Constant	0.80	0.25	0.30, 1.30	0.81	0.20	0.42, 1.20	4.75	0.16	4.44, 5.06
X (Condition)	–1.37	0.37	–2.10, –0.63	0.45	0.29	–0.12, 1.03	0.09	0.22	–0.35, 0.53
M1 (1st happiness shift)	—	—	—	–0.74	0.07	–0.88, –0.60	0.20	0.08	0.06, 0.35
M2 (2nd happiness shift)	—	—	—	—	—	—	0.29	0.07	0.15, 0.43
	$R^2 = 0.11$			$R^2 = 0.56$			$R^2 = 0.14$		
	$F(1, 111) = 13.66, p < .001$			$F(1, 110) = 13.66, p < .001$			$F(1, 109) = 6.05, p < .001$		

Table S5b

Serial Mediation Model for the Effect of Condition on Transportation via Sadness Shifts (Experiment 1)

	Consequent								
Antecedent	M1 (1st sadness shift)			M2 (2nd sadness shift)			Y (Transportation)		
	b	*SE*	95% CI	*b*	*SE*	95% CI	*b*	*SE*	95% CI
Constant	–0.07	0.22	–0.50, 0.36	–0.34	0.18	–0.70, 0.01	4.97	0.15	4.67, 5.26
X (Condition)	1.37	0.32	0.74, 2.00	0.10	0.28	–0.46, 0.66	0.04	0.23	–0.42, 0.50
M1 (1st sadness shift)	——	——	——	–0.67	0.08	–0.82, –0.51	0.11	0.08	–0.05, 0.28
M2 (2nd sadness shift)	——	——	——	——	——	——	–0.06	0.08	–0.21, 0.10
	$R^2 = 0.14$			$R^2 = 0.43$			$R^2 = 0.06$		
	$F(1, 111) = 18.70, p < .001$			$F(1, 110) = 40.62, p < .001$			$F(1, 109) = 2.46, p = .067$		

S6 Stimulus Material and Cues for Emotion Ratings per Story Part (Experiment 2)

Career Change Story (German Version)

Exposition (positive, 490 words)

Endlich, das Praktikum war vorbei. Simon verspürte ein euphorisches Kribbeln, während er zum letzten Mal das gläserne Hochhaus, in dem er die letzten drei Monate gearbeitet hatte, verließ. Er atmete tief durch, lockerte den Knoten seiner Krawatte und war gerade auf dem Weg zur Bushaltestelle, um so schnell wie möglich nach Hause zu fahren – da klingelte sein Handy.
„Hallo, Sie geschäftiger Geschäftsmann, haben Sie gerade Zeit oder sind Sie schon auf dem Weg zum nächsten Meeting?“, erklang Tims Stimme und Simon grinste.
„Hi Tim. Bin grade auf dem Heimweg. Heute war der letzte Tag!“
„Ja bestens. Dann hast du doch jetzt sicher Zeit, oder?“
„Was hast du vor?“
„Bisschen Sonne genießen im Park? Vielleicht hast du es in deinem Büro gar nicht mitbekommen, aber es ist endlich Sommer. Also lass was machen.“
„Auf jeden Fall. Wann und wo?“
„Jetzt gleich, unten am Fluss, würde ich sagen. Gleicher Spot wie immer.“
„Okay“, sagte Simon, kehrte um und machte sich auf den Weg in Richtung Park.
***
Tim lag schon auf der Wiese, als Simon ankam. Er grinste ihm entgegen und klopfte auf den freien Platz neben sich. „Na, was geht?“, sagte Tim und reichte ihm eine Limo.
„Danke, sehr großzügig“, sagte Simon während er sich neben ihm niederließ.
„Ist ja bald Monatsanfang und guten Freunden gibt man auch mal ne Limo aus, auch wenn sie es mit ihrem Bonzenzwirn ja nicht so nötig zu haben scheinen“, entgegnete Tim mit einem Blick auf Simons Anzug.
Simon lachte. „Bin halt direkt hergekommen.“ Er zog sein Jacket, Schuhe und Socken aus und nahm einen Schluck von der Limo.
„Erzähl mal, wie war denn das Praktikum?“, fragte Tim.
„Nicht so der Hammer. Ich saß die ganze Zeit in diesem Büro an irgendwelchen Präsentationen, oft bis zehn oder elf Uhr abends. Und wenn noch einmal einer was von Gewinn und Umstrukturierung sagt, kotz ich. Achja, hab ich erwähnt, dass ich nebenbei noch eine Hausarbeit zu schreiben hatte?“
„Puh“, sagte Tim und runzelte die Stirn.
„Manchmal hab ich mich echt gefragt, ob das ganze Studium so das Richtige für mich ist. Ich fühl mich in dieser Welt irgendwie fehl am Platz.“
„Oy. Ein BWL-er mit Selbstzweifeln“, neckte Tim.
Simons Handy klingelte. Ein Blick aufs Display ließ Simon erstaunt die Augenbrauen hochziehen. „Wow, ich weiß nicht, wann meine Eltern mich zuletzt angerufen haben. – Hallo, Papa“, sagte Simon.
„Hallo, Junge, wie war das Praktikum?“
„Ganz gut. Wie geht’s dir so?“
„Alles prima… Willst du morgen Abend zum Essen vorbeikommen? Wir wollen dir was Wichtiges sagen. So gegen sieben?“

„Oh, ja, natürlich, was gibt's denn?"
„Ich glaube irgendwas mit Hähnchen …"
Simon rollte mit den Augen. „Ich meine nicht zu Essen. Was gibt's so Wichtiges zu bereden?"
Sein Vater lachte kurz auf. „Das besprechen wir dann morgen. Also dann!"
Verdutzt starrte Simon auf das Handydisplay. „Also meine Eltern laden mich echt nicht oft zu sich ein. Meistens muss ich mich selber einladen."
„Vielleicht wirst du verkuppelt", sagte Tim.
„Sehr witzig."

Complication (649 words)
Highlighted passages differ between conditions

Negative turn of events

Die ganze Zugfahrt zu seinen Eltern grübelte Simon darüber, was sie ihm wohl zu sagen hätten. Eigentlich sollte er sich freuen, aber das mulmige Gefühl wollte einfach nicht von ihm ablassen.
Sein Elternhaus empfing ihn in seiner gewohnten Kühle. Noch bevor er läuten konnte, öffnete sein Vater ihm die Tür und bedeutete ihm, einzutreten. „Hallo Simon!"
Drinnen war der Tisch bereits gedeckt. „Das Hühnchen ist bald fertig", sagte seine Mutter, „setz dich! Möchtest du etwas Wein? Wie lief das Praktikum?"
Während sein Vater Wein ausschenkte, bemühte Simon sich, seinen Eltern zu erzählen, was sie hören wollten und ein positives Bild von seinem Praktikum zu vermitteln. Als sie näher nachfragten, ob er sich nach seinem Abschluss um eine Stelle bei der Unternehmensberatung bemühen würde, wich er unverbindlich aus.
„Ich werde mal sehen, was da zu machen ist, Sohn", versicherte sein Vater mit einem jovialen Schulterklopfen.
„Lass gut sein Papa", sagte Simon und nahm hastig einen viel zu großen Schluck vom Wein. „Was hattet ihr mir denn so dringend zu erzählen?"
Seine Eltern warfen sich vielbedeutende Blicke zu, dann lehnte sein Vater sich zurück und sagte: „Wir expandieren nach China und die Geschäftsführung will mich

Positive event

Die ganze Zugfahrt zu seinen Eltern grübelte Simon darüber, was sie ihm wohl zu sagen hätten. Er freute sich, seine Eltern zu sehen und war gespannt darauf, welche Überraschung wohl auf ihn wartete.
Sein Elternhaus empfing ihn in der gewohnten Gepflegtheit. Noch bevor er läuten konnte, öffnete sein Vater ihm die Tür und bedeutete ihm, einzutreten. „Hallo Simon!"
Drinnen war der Tisch bereits gedeckt. „Das Hühnchen ist bald fertig", sagte seine Mutter, „setz dich! Möchtest du etwas Wein? Wie lief das Praktikum?"
Während sein Vater Wein ausschenkte, bemühte Simon sich, seinen Eltern von den positiven Seiten seines Praktikums zu erzählen. Als sie näher nachfragten, ob er sich nach seinem Abschluss um eine Stelle bei der Unternehmensberatung bemühen würde, ließ er jedoch etwas von seinen Zweifeln durchklingen. „Ich weiß nicht, ob ich mich an das Arbeitsklima in einer Unternehmensberatung auf Dauer so gewöhnen könnte", sagte er. Von seinen generellen Zweifeln das Studium betreffend sagte er lieber erstmal noch nichts.
„Du wirst schon das richtige für dich finden, Simon", sagte seine Mutter und sein Vater nickte beipflichtend.
„Jetzt rückt ihr doch mal mit der Sprache raus", sagte Simon. „Was habt ihr mir denn

zum Area Manager in Shanghai machen. Deine Mutter bekommt eine Stelle im Controlling. Das heißt, wir ziehen nach Shanghai.“

Simon sagte nichts und blickte vom selbstzufrieden lächelnden Gesicht seines Vaters zu dem seiner Mutter, die ihn mit erwartungsvoller Miene ansah. Simon räusperte sich und bemühte sich, etwas zu sagen. „Ja, China, wow“, brachte er schwach hervor. „Aber … ihr habt doch schon alles. *Hier*, meine ich. Euch macht doch die Arbeit hier Spaß, oder? Und ich bin ja auch hier … China ist ganz schön weit weg.“

Sein Vater sah ihn etwas mitleidig an, als müsste er einen fünfjährigen Jungen trösten. „Es wird Zeit für eine neue Herausforderung. Und dass die Geschäftsleitung mich für die Aufgabe will, ist eine Ehre, die ich nicht ausschlagen kann. Und auch nicht will.“ Simons Mutter nickte bekräftigend.

Während des Essens erzählten seine Eltern mehr von ihren Plänen, von chinesischen Businesspartnern, überhaupt der chinesischen Kultur, was alles noch zu organisieren sei vor dem Umzug, doch Simon hörte kaum zu. Sein Blick fiel auf den großen Einbauschrank in der Diele. Er erinnerte sich, wie er sich als Kind einmal einen ganzen Tag in diesem Schrank versteckt und so getan hatte, als wäre er von zuhause weggelaufen. Ungeduldig hatte er darauf gewartet, seine Eltern besorgt umherlaufen und seinen Namen rufen zu hören. Gegen Abend hatte ihn dann der Hunger aus seinem Versteck getrieben, ohne dass seine Eltern von seinem Verschwinden auch nur Notiz genommen hatten.

Nach dem Essen verkündete er, nicht über Nacht zu bleiben und den letzten Zug zurück zu nehmen. Auf dem Weg zum Bahnhof fühlte er sich genauso verlassen wie das

so Wichtiges mitzuteilen? Die Zugfahrt hat sich schon angefühlt wie vier Stunden statt zwei, ihr könnt mich jetzt nicht länger auf die Folter spannen.“

Seine Eltern warfen sich vielbedeutende Blicke zu, dann lehnte sein Vater sich zurück und sagte: „Wir expandieren nach China und die Geschäftsführung will mich zum Area Manager in Shanghai machen. Deine Mutter bekommt eine Stelle im Controlling. Das heißt, wir ziehen nach Shanghai.“

Simon war baff und blickte ungläubig zwischen dem zufrieden lächelnden Gesicht seines Vaters und dem seiner Mutter hin und her. Beide sahen ihn mit erwartungsvoller Miene an. „Wow“, brachte Simon schließlich hervor. „China? Krass! Wow … Glückwunsch!“

„Danke“, sagte sein Vater.

„Aber … habt ihr nicht auch ein bisschen Bedenken? Ihr habt doch hier schon alles erreicht.“

„Wir fanden beide, es wird Zeit für eine neue Herausforderung“, sagte Simons Mutter schulterzuckend. „Und als die Geschäftsleitung deinem Vater das Angebot gemacht hat, dachten wir, vielleicht ist das der Anstoß, den wir brauchten!“

Simons Vater nickte. „Das Ganze ist natürlich durchaus ein Risiko … wir wissen ja noch nicht, ob das Geschäft in China überhaupt laufen wird. Es wird sicher auch nicht leicht, sich in China einzuleben. Andererseits, man wächst an seinen Aufgaben. Es ist ein großer Vertrauensbeweis von der Geschäftsleitung, dass sie mich für diese Aufgabe wollen, das kann ich nicht so einfach ausschlagen. Und will es auch nicht.“

Während des Essens erzählten seine Eltern mehr von ihren Plänen, von chinesischen Businesspartnern, überhaupt der chinesischen Kultur, von den Semesterferien, die Simon natürlich in

Kind, das den ganzen Tag im Schrank ausgeharrt hatte. Seine Eltern hatten ihm nie die familiäre Geborgenheit gegeben, nach der er sich immer gesehnt hatte. „Vielleicht habe ich ja deswegen mit dem BWL-Studium angefangen“, dachte er bei sich. „Weil ich dachte, dass sie mich dann endlich wahrnehmen würden.“

Im Zug starrte er aus dem Fenster in die schwarze Nacht. Vielleicht war es Zeit, sich mit der Frage auseinanderzusetzen, was *er*, Simon, eigentlich wollte. Sollte er sein BWL-Studium hinschmeißen und etwas anderes studieren, das ihn richtig erfüllte? Im letzten Jahr hatte sich bei ihm zunehmend die Erkenntnis durchgesetzt, dass er am liebsten etwas Pädagogisches studiert hätte. Andererseits … es fehlte nicht mehr viel, dann hätte er den Abschluss in der Hand. Er müsste ja nicht in einer Unternehmensberatung arbeiten. Wer sagte denn, dass er sein Lebensglück in der Arbeit suchen sollte, wie seine Eltern? Vielleicht sollte er einen Job einfach als Job sehen, der ihm letzten Endes sein eigenes Familienglück ermöglichte, nach dem er sich so sehnte …

Er rieb sich die Augen und betrachtete sein Spiegelbild im Zugfenster. Er würde eine Nacht darüber schlafen und morgen mit Tim sprechen.

China verbringen könnte. Lange war die Stimmung mit seinen Eltern nicht mehr so ausgelassen gewesen.

Als Simon am Ende des Abends in seinem alten Kinderzimmer lag, fiel sein Blick auf ein Bild an der Wand, das er einmal in der Schule gemalt hatte. Sie hatten sich selbst malen sollen, wie sie sich in der Zukunft sahen. Sein Bild war im Grunde ein Porträt seines Vaters. Seine Eltern waren für ihn immer Vorbilder gewesen und er hatte stets versucht, in ihren Fußstapfen zu wandeln. „Im Grunde“, dachte er, „habe ich auch nur deswegen mit BWL angefangen.“ Und dennoch fühlte sich das BWL-Studium für ihn nicht richtig an. Er war in der Welt der anzugtragenden Businessleute einfach nicht zuhause und würde es auch nie sein. Sollte er sein Studium hinschmeißen und etwas anderes anfangen? Im letzten Jahr hatte sich bei ihm zunehmend die Erkenntnis durchgesetzt, dass er am liebsten etwas Pädagogisches studiert hätte. Und eigentlich lebten ihm seine Eltern ja vor, dass in einem Neuanfang eine Chance lag. Nie hätte er einen derartigen Lebenswandel von seinen Eltern erwartet, aber nach dem heutigen Abend spürte er, dass sie seine Entscheidung akzeptieren würden.

Er rieb sich die Augen und löschte das Licht. Er würde eine Nacht darüber schlafen und morgen mit Tim sprechen.

Resolution (positive, 311 words)

Zehn Jahre später

Der Gong ertönte. Simon packte seine Aktentasche zusammen, während die Schüler seiner neunten Klasse lärmend in die Große Pause strömten. „Bis heute Nachmittag!“, sagten Jonas, Thea und Ebru im Vorbeigehen. Es war Freitag und der erste Tag der Theater-AG, die Simon ins Leben gerufen hatte. Seine zehnte Klasse in Deutsch war Feuer und Flamme gewesen und in der 9c, in der er Wirtschaft unterrichtete, hatte er immerhin die drei für die AG rekrutieren können. „Bis später“, antwortete Simon. Er konnte nur mit Mühe seine Vorfreude im Zaum halten. Noch eine Stunde Deutsch mit der anstrengenden 9d, dann war es soweit.

Im Lehrerzimmer gesellte er sich zu Patrick und Helena, die beide zeitgleich mit ihm angefangen hatten. Patrick wirkte gestresst und erzählte gestikulierend von den jüngsten

Eskapaden in der 9d, während er gleichzeitig versuchte, seine Unterlagen für die nächste Stunde zu sortieren.
„Hallo Simon“, begrüßte ihn Helena fröhlich. „Du hast heute deine Theater-AG, oder? Ich glaube, du triffst damit einen richtigen Nerv! Aus meiner Spanischklasse grade eben wollen mindestens drei hingehen.“
„Puh“, sagte Patrick. „Vielleicht dann lieber *Der Besuch der alten Dame* aufführen statt *Die Physiker*, oder? Da gibt’s immerhin Rollen für ein ganzes Dorf zu besetzen.“
„Ach was“, sagte Simon. „Das dünnt mit der Zeit sicher aus. Und die Stückauswahl ist sowieso noch nicht fix.“
Ein Kollege verwickelte Patrick und Helena in ein Gespräch über eine anstehende Klassenfahrt und Simon nutzte den Moment, sich zurückzulehnen und die Sonne sein Gesicht wärmen zu lassen. Keine Sekunde hatte er es bereut, auf Lehramt umzuschwenken. Er war der älteste von den Junglehrern, was ihn sowohl mit den anderen Junglehrern als auch den erfahreneren Kollegen gut auskommen ließ. Er dachte an den Simon vor 10 Jahren und wünschte, ihm seine Sorgen abnehmen zu können.
Als die Klingel das Ende der Pause einläutete, machte er sich lächelnd auf zur letzten Stunde des Tages.

Cues for the Emotion Rating

For the assessment of emotion ratings for each story part, the following summaries were presented to participants as a cue:

1. Exposition: Simons Praktikum ist vorbei. Seine Eltern laden ihn zum Essen ein. [Simon’s internship is finished. His parents invite him over for dinner.]
2. Complication: Simon besucht seine Eltern. Er denkt über die Entscheidung der Eltern, nach China auszuwandern, nach. [Simon visits his parents. He reflects on his parents’ decision to move to China.]
3. Resolution: Zehn Jahre später: Simon reflektiert seine eigene Entscheidung. [Ten years later: Simon reflects on his decision.]

S7 Zero Order Correlations (Experiment 2)

Table S7

Zero-Order Correlations by Group (Experiment 2).

	1	2	3	4	5	6
1. 1st happiness shift*	-	.600 (<.001)	.593 (<.001)	.341 (.025)	.238 (.124)	.139 (.375)
2. 2nd happiness shift*	.136 (.299)	-	.657 (<.001)	.444 (<.003)	.329 (.031)	.185 (.234)
3. 1st sadness shift*	.297 (.021)	.242 (.063)	-	.469 (.002)	.385 (.011)	.171 (.274)
4. 2nd sadness shift*	-.008 (.952)	.515 (<.001)	.509 (<.001)	-	.323 (.035)	.135 (.388)
5. Emotional flow	.131 (.319)	.304 (.018)	.108 (.412)	.162 (.215)	-	.702 (<.001)
6. Transportation	.129 (.325)	.263 (.042)	-.076 (.562)	.164 (.209)	.696 (<.001)	-

Note. Results for the shift condition (n = 43) are displayed above the diagonal, for the positive condition (n = 60) below the diagonal. Correlation p-values in brackets. *Shift variables (1.-4.) represent absolute values of difference scores of emotion ratings between subsequent story parts (shift 1 = exposition to complication, shift 2 = complication to resolution).

S8 Mediation Analyses (Experiment 2)

Table S8a

Serial Mediation Model for the Effect of Condition on Transportation via Happiness Shifts (Experiment 2)

	Consequent								
Antecedent	M1 (1st happiness shift)			M2 (2nd happiness shift)			Y (Transportation)		
	b	*SE*	95% CI	*b*	*SE*	95% CI	*b*	*SE*	95% CI
Constant	0.25	0.22	–0.19, 0.69	1.72	0.17	4.52, 5.19	4.86	0.17	4.52, 5.19
X (Condition)	–1.58	0.34	–2.25, –0.90	0.22	0.07	–0.09, 0.36	0.00	0.21	–0.41, 0.41
M1 (1st happiness shift)	——	——	——	0.30	0.07	0.16, 0.44	0.22	0.07	0.09, 0.36
M2 (2nd happiness shift)	——	——	——	——	——	——	0.29	0.07	0.16, 0.44
	$R^2 = 0.17$			$R^2 = 0.48$			$R^2 = 0.16$		
	$F(1, 101) = 21.31, p < .001$			$F(1, 100) = 46.09, p < .001$			$F(1, 99) = 6.20, p < .001$		

Table S8b

Serial Mediation Model for the Effect of Condition on Transportation via Sadness Shifts (Experiment 2)

	Consequent								
Antecedent	M1 (1st sadness shift)			M2 (2nd sadness shift)			Y (Transportation)		
	b	*SE*	95% CI	*b*	*SE*	95% CI	*b*	*SE*	95% CI
Constant	0.28	0.21	–0.13, 0.70	–1.04	0.16	–1.37, –0.72	5.21	0.15	4.91, 5.51
X (Condition)	0.74	0.32	0.10, 1.38	–0.24	0.26	–0.75, 0.27	0.00	0.20	–0.40, 0.40
M1 (1st sadness shift)	——	——	——	–0.61	0.08	–0.77, –0.46	–0.04	0.08	–0.20, 0.11
M2 (2nd sadness shift)	——	——	——	——	——	——	–0.15	0.08	–0.30, 0.01
	$R^2 = 0.05$			$R^2 = 0.41$			$R^2 = 0.04$		
	$F(1, 101) = 5.26, p = .024$			$F(1, 100) = 35.37, p < .001$			$F(1, 99) = 1.46, p = .230$		

References in the Supplement

Clayton, R. B., Raney, A. A., Oliver, M. B., Neumann, D., Janicke-Bowles, S. H., & Dale, K. R. (2021). Feeling transcendent? Measuring psychophysiological responses to self-transcendent media content. *Media Psychology*, *24*(3), 359–384. https://doi.org/10.1080/15213269.2019.1700135

Diedenhofen, B., & Musch, J. (2015). cocor: A comprehensive solution for the statistical comparison of correlations. *PLoS ONE, 10*(4), e0121945. https://doi.org/10.1371/journal.pone.0121945

Meng, X.-L., Rosenthal, R., & Rubin, D. B. (1992). Comparing correlated correlation coefficients. *Psychological Bulletin, 111*(1), 172–175. https://doi.org/10.1037/0033-2909.111.1.172

Nabi, R. L. & Green, M. C. (2015). The role of a narrative's emotional flow in promoting persuasive outcomes. *Media Psychology, 18*, 137–162. https://doi.org/10.1080/15213269.2014.912585

Oliver, M. B., & Bartsch, A. (2010). Appreciation as audience response: exploring entertainment gratifications beyond hedonism. *Human Communication Research*, *36*(1), 53–81. https://doi.org/10.1111/j.1468-2958.2009.01368.x

Schneider, F. M., Bartsch, A., & Oliver, M. B. (2017). Factorial validity and measurement invariance of the appreciation, fun, and suspense scales across US-American and German samples. *Journal of Media Psychology*, *31*(3), 149–156. https://doi.org/10.1027/1864-1105/a000236

Zillmann, D. (1991). The logic of suspense and mystery. In J. Bryant & D. Zillmann (Eds.), *Responding to the screen: Reception and reaction processes* (pp. 281–304). Erlbaum.

11 Final Discussion

In this thesis, I examined the interrelationship of emotional shifts induced by narratives with transportation into the story world and how these processes are linked with story-consistent attitudes, behavior, and social sharing intentions. To this end, I report seven studies in three manuscripts that investigated these research questions across a diverse set of narrative stimuli which varied in terms of genre, topic, and presentation mode, and exploring different approaches to measure emotional shifts in the moment they occur.

In Manuscript #1, I investigated the relationship of valence shifts obtained using real-time-response measurement during two movies with transportation and a post-exposure self-report measure of emotional flow. Manuscript #2 extends the scope by not only investigating transportation and emotional shifts as narrative processes, but by examining their links to story-consistent cognitive and affective attitudes, donation behavior, and social sharing intentions as a form of post-narrative engagement. The experimental series presented in Manuscript #2 also includes a tried-and-tested manipulation of transportation via positive and negative reviews presented prior to reading (Tiede & Appel, 2020) to examine the causal link between transportation and emotional shifts. Furthermore, Manuscript #2 presents and refines an innovative self-report method for the continuous measurement of emotional shifts during reading: self-probed emotional retrospections. Manuscript #3 connects emotional shifts to structural features of the narrative and examines effects on transportation. Narrative structures of audio stories were manipulated to test whether narratives that reflect an emotional arc shifting from positive to negative and back to positive elicit greater overall transportation than entirely positive versions of this story, and if this effect is explained by the happiness- and sadness-shifts elicited by the story.

In the following sections, I will discuss the findings of these studies and outline possible avenues for future research with regard to the link between transportation and emotional shifts,

and the role of these experiences for narrative persuasion and post-message engagement. Then I discuss some methodological considerations regarding different aspects of operationalizing emotional shifts, and the limitations of the studies presented here, before closing with some concluding remarks.

11.1 Narrative Processes: The Link Between Transportation and Emotional Shifts

The most consistent finding across these studies (all but the Pilot study in Manuscript #3, which did not include a measure for transportation) is that, consistent with theory (Nabi, 2015; Nabi & Green, 2015), transportation and the experience of emotional shifts are significantly and substantially related. The more audiences are transported into narratives, the more strongly they experience the emotional ups and downs of a story. This was the case for RTR valence shifts while watching a movie (Manuscript #1), as well as for the number and intensity of emotional shifts obtained through self-probed retrospections while reading a fictional short story and a non-fictional journalistic reportage (Manuscript #2). In Manuscript #3, happiness shifts (but not sadness shifts) elicited by the narrative events of audio stories were consistently related to transportation, based on retrospective emotions ratings felt during three story parts.

One assumption of the emotional flow framework by Nabi and Green (2015) is that emotional shifts reinforce transportation. There is good reason to assume that there is a bidirectional relationship between emotional shifts and transportation. On the one hand, paying close attention to the narrative and experiencing a deictic shift through which the story world becomes the frame of reference (Busselle & Bilandzic, 2008; Hamby et al., 2018) are prerequisites for the experience of emotional shifts. Forming mental models of the narrative world, seeing it from the protagonist's point of view and building expectations about the unfolding story event are necessary for audiences to be emotionally affected by the story. On the other hand, emotional shifts redirect cognitive resources to the narrative through orienting

responses (Sukalla, Bilandzic, et al., 2016), contribute to the accumulation of arousal through excitation transfer (Zillmann, 1996), and are involved in the experience of suspense, which are critical factors for transportation (Bálint et al., 2017; Bezdek & Gerrig, 2017).

In the studies presented in Manuscript #2 and #3, I examined whether transportation and emotional shifts are causally intertwined by creating favorable or unfavorable conditions for the experience of transportation (through positive or negative reviews, Manuscript #2), and emotional shifts (by manipulating narrative structures, Manuscript #3).

In line with previous research (e.g., Appel et al., 2019; Krause & Appel, 2020; Tiede & Appel, 2020), reviews were an overall effective way to manipulate levels of transportation without altering the content of the stimulus material. In both Experiments 1 and 2, negative reviews led to lower levels of transportation compared to a no-review comparison group (Experiment 1) or a positive review (Experiment 2), which in turn was associated with a decreased experience of emotional shifts in terms of their number and especially their intensity. This ties in with previous research by Appel et al. (2019), who show that a positive review of a short movie led to increased experiences of transportation, which in turn was related to increased facially expressed event-congruent emotions. However, the number and intensity of emotional shifts did not differ between conditions. Although the effect size of transportation was substantial (d = 0.67 in both Experiment 1 and 2 for the significant differences), it might not have been large enough to lead to observable differences in emotional shifts during relatively lengthy stories (2547-3180 words).

In Manuscript #3, shifting story structures (pos-neg-pos) led to overall stronger emotional shifts of happiness and sadness than stories with positive-only trajectories. The happiness shifts elicited by the story events in turn were related to transportation, such that increases of happiness in particular were associated with higher levels of transportation, as indicated by a two-step mediation model and Pearson correlations. However, the results are more ambiguous with regard to sadness shifts. Although Pearson correlations showed a

significant and positive relationship of sadness shifts with transportation in Experiment #1 (but not Experiment #2), unlike happiness shifts, sadness shifts between subsequent story parts did not emerge as mediators of the relationship between the experimentally manipulated story structures and transportation. Furthermore, even though the treatment successfully manipulated emotional shifts, the shifting narrative structures did not yield greater overall transportation than the positive story versions.

Since the research presented in this thesis has been conducted, a few other studies have attempted to manipulate the experience of emotional shifts and examined effects on other narrative experiences, such as transportation. These studies show mixed results: Alam and So (2020) found greater transportation for stories that elicited a single emotional shift (pos-neg or neg-pos) versus single-valenced stories, although this effect might also be due to the difference in story length. Other studies have failed to produce evidence of a causal effect of emotional shifts on transportation. Fitzgerald et al. (2020) compared restorative narratives in the context of health communication (narratives that highlight protagonist's strength and resilience in the face of crises and which typically contain a shifting emotional trajectory) with a negative story that focused on adversity and suffering. However, they found no significant difference with regard to transportation in a large sample (n = 402). Similarly, Ophir et al. (2021) examined effects of different story versions that represented a shift in emotional content towards the end compared to stories with emotionally neutral endings in two studies (n = 385 and 586). Consistent with the findings in Manuscript #3, but contrary to expectations, Ophir and colleagues did not find the shifting stories to yield greater transportation than the stories without shift. A possible explanation for this could be story length. The stimuli were long enough to tell a full story with lively, fleshed out characters, but not too long so as for a lack of obstacles or twists to cause boredom. Longer narratives that include more shifts in their storyline, where characters face and overcome adversity, may very well be more transporting than narratives that do not (see also Ophir et al., 2021).

The results of the experiments in Manuscript #3 further suggest that positive happiness shifts may be particularly conducive to transportation. In both experiments, some parts of the positive control stories also elicited increases of happiness, albeit to a lesser degree. Nevertheless, this may have contributed to an obfuscation of a possible total effect of the shifting vs. positive story version on transportation. As argued above, possible advantages of shifting versus positive-only stories in terms of transportation might become more obvious for longer narratives, as they provide more opportunity for elaborate event structures that enable repeated increases of positive emotion. However, this is a question that remains unanswered at this point and should be addressed by future research.

Interestingly, happiness and sadness shifts played different roles for the relationship between story structures and transportation. Whereas happiness emerged as a mediator, sadness did not. One possible explanation could be the arousal associated with these emotions. Sadness is a low-arousal emotion, whereas happiness is usually accompanied by moderate to high arousal (Kreibig, 2010). Arousal has also been linked to the emotional engagement dimension of narrative engagement (Sukalla, Bilandzic, et al., 2016).

Another explanation could be story schemata, that is, expectations audiences hold about stories, their typical themes, structures, and the emotional experiences associated with them (Dixon & Bortolussi, 2009; Grodal, 1999; Raney, 2004; Tan, 1995; Visch & Tan, 2008). The shifting story was modelled after one of the most common story structures, which starts out positively, includes some kind of adversity in the middle, but is ultimately resolved with a happy ending (del Vecchio et al., 2021; Reagan et al., 2016; Vonnegut, 1981). Thus, participants might have expected this prototypical trajectory, and the anticipation of a happy ending might have fueled audiences' transportation. Different emotional shifts might play a role for transportation into stories of other genres (e.g., tragedies, thrillers, horror movies; Wirth & Schramm, 2005). Therefore, future research should examine how different genres or story structures affect which kind of emotional shifts are related to transportation.

Lastly, both shifting and positive-only narrative arcs might be equally transporting, but for different reasons. Whereas a shifting narrative arc might influence transportation by increasing attention, sympathy and engagement with the character, and suspense (Nabi & Green, 2015), a story that is positive throughout might be transporting by enabling a pleasing and non-challenging experience that is easy to comprehend. Therefore, experiences in response to these stimuli might reflect different processing modes and gratifications that can be derived from different types of narratives, in terms of affect regulation and hedonic pleasure on the one hand, and deeper, more meaningful entertainment experiences that are characterized by mixed affect (Cupchik, 2011; Oliver et al., 2021; Oliver & Bartsch, 2010; Wirth et al., 2012).

11.2 Emotional Shifts, Transportation, and Story-Consistent Outcomes

11.2.1 Story-Consistent Attitudes and Behavior

The studies presented in Manuscript #2 largely confirmed the key role of transportation as a mechanism through which narratives shape attitudes (Tukachinsky & Tokunaga, 2013; van Laer et al., 2014). Higher levels of transportation predicted the endorsement of story-consistent attitudes towards old-age romance in Experiment 1, and affective-level attitudes in Experiment 2. Transportation was not related to attitudes towards old-age suicide (Experiment 1), which might be more stable for being rooted in values and moral convictions (Skitka et al., 2005). A recent study by Walter et al. (2021) investigating the influence of processing fluency on narrative persuasion shows that such strongly held and value-laden attitudes are unlikely to change as a result of fluent and flow-like narrative experiences (such as transportation), but might rather be influenced by the opposite experience. In two experiments they showed that participants who had moderate or indifferent pre-existing attitudes on the controversial topic of physician-assisted suicide were more influenced by a fluent and flow-like experience, whereas participants who had strong (favorable or unfavorable) prior attitudes were less certain about their attitudes after a disfluent experience.

Transportation was also not related to cognitive-level attitudes in Experiment 2, which is in line with the idea that narrative effects might be found with respect to affect-related outcomes in particular (Zebregs et al., 2015). However, donations in favor of an NGO related to the cause described in the story were not affected by the extent to which participants were transported into the narrative (Experiment 2). According to the theory of reasoned action, behavior is predicted by behavioral intentions, which are shaped by attitudes and perceived social norms (Fishbein, 1980). Although transportation predicted affective-level attitudes towards the Sahel people in Experiment 2, the behavioral measure might have been too specific for a behavioral effect to come through. Such specific behaviors are more likely to be influenced by attitudes towards the behavior (rather than its object; Ajzen et al., 2018).

Similar to the findings reported by Ophir et al. (2021) and Sangalang et al. (2019), emotional shifts were not associated with story-consistent attitudes. It is possible that for persuasive outcomes, taking into account the degree to which the emotional responses of participants reflect the emotions implied by the narrative events, especially those that are causally decisive for generating the persuasive message (see Dahlstrom, 2010, 2012) would yield different results, similar to what Appel et al. (2019) found. In their study, facially displayed event-congruent emotions during a key scene of a film were related to a higher growth mindset. The emotional shifts measures used in Manuscript #2 reflected the diversity of emotional shifts that can occur during narrative experiences as a result of an interplay of various processes, including identification, sympathy, or personal memories (see Chapter 4.2). This broader focus seemed sensible given the early stage of research on the persuasive influence of emotional shifts during narrative processing. However, future research should consider how the underlying sources of emotional shifts affect their influence on different types of narrative outcomes.

11.2.2 Social Sharing Intentions and Post-Narrative Engagement

The effects of the experience of emotional shifts as conceptualized here might also be found in terms of post-message engagement rather than immediate message acceptance (see Nabi & Green, 2015), such as reflecting about the story, or social sharing, which are important aspects of generating meaning from a narrative experience (Bartsch et al., 2014; Rimé, 2009).

Overall, emotional shifts appeared to be most relevant for social sharing intentions, that is, people's intentions to talk about the contents of the narrative with others, and recommend or otherwise engage with it online. Both the intensity and the number of emotional shifts were positively correlated with social sharing intentions. The intensity of emotional shifts also emerged as a mediator of the relationship between review condition and social sharing, such that the positive review increased transportation relative to the negative review, which was related to a greater intensity of shifts, and subsequently, to increased social sharing intentions. This connects with recent findings in the context of meaningful stories, which can be related to emotional shifts: Fitzgerald et al. (2020) found that a narrative that focused on resilience and hope increased social sharing intentions compared to a story that focused on suffering, and Clayton et al. (2021), found that people reported greater social sharing intentions for self-transcendent videos than for humorous videos. The self-transcendent videos also elicited psychophysiological responses indicative of greater cognitive resource allocation, arousal, and a shift in positive affect. Hamby et al. (2020) show that a perceiving the character's struggles and motivation to reach a goal, particularly if the character was motivated by reasons perceived as meaningful, led to greater emotional engagement, and a greater sense of being moved, which was related to greater social sharing intentions.

Taken together, these findings point towards the role emotional shifts, particularly those associated with narratives that elicit meaningful entertainment experiences, may play for generating conversations. Emotional experiences have been shown to create a desire to talk about these experiences, in order to gain emotional support, to make sense of the events that

elicited emotions, or (in the case of positive emotions), to prolong and savor positive experiences (Rimé, 2009), and that the ability to talk about these experiences is one of the gratifications people draw from emotional media content (Bartsch, 2012). Thus, the ability of stories to generate strong and dynamic emotional experiences may serve an important function in the process of generating insight from stories via interpersonal conversations, particularly in light of the fact that meaning often has to be extrapolated from narrative events.

Hamby et al. (2018; see also Hamby et al., 2017) suggest a framework integrating two approaches to explain narrative persuasion. On the one hand, narratives can persuade via the highly absorbed processing mode associated with transportation, narrative engagement, or identification, which directs all available resources to the narrative. Persuasion through this path occurs because transportation depends on comprehending the narrative (Busselle & Bilandzic, 2008), including its narrative chain of cause and effects (Dahlstrom, 2012), forming vivid imagery, and because cognitive resources are fully invested in the narrative, processes related to resistance are inhibited (Ratcliff & Sun, 2020). On the other hand, people generate meaning from a story by reflecting on it, to the extent that elements from the story elicit "personal resonance" (Seilman & Larsen, 1989), that is, if audience members can relate aspects from the narrative to their own lives (Hamby et al., 2018). Hamby et al. (2018) propose that a deictic shift into the story and the resulting experience of transportation (or related absorbing states) can increase reflection about a story, especially if aspects of the narrative resonate personally or autobiographical memories are evoked. Similar propositions have been made by other scholars (Bilandzic, 2006; Dill-Shackleford et al., 2016), which overall underscore the notion that even though transportation is thought of as a flow-like state characterized by a temporary loss of self, self-referencing and transportation are not necessarily contradictory. Some evidence indeed suggests that autobiographical memories in response to a narrative can increase subsequent attention to the narrative (Tchernev et al., 2023).

In part, the findings in Manuscript #2 might be explained against this backdrop. Results show that transportation was a significant mediator of story-consistent attitude effects in some instances, as indicated by indirect effects of the review manipulation on attitudes towards old-age-romance (Experiment 1) and affective attitudes towards Sahel people (Experiment 2) via transportation. However, although transportation was also related to emotional shifts, emotional shifts did not emerge as a mediator. It is possible that emotional shifts might predict outcomes related to reflective processing better (Bartsch et al., 2014), because the emotional shifts measures captured emotional responses from various different processes that may occur while following the narrative, including such that might have rendered the experience as personally meaningful. The link of emotional shifts with social sharing intentions gives some tentative support for this interpretation, to the extent that the desire to share and talk about one's experiences with others reflects a desire to make sense of them (Rimé, 2009). However, further research is necessary to investigate the role of emotional shifts in generating post-narrative engagement and reflection.

11.3 Methodological Considerations on the Operationalization of Emotional Shifts

11.3.1 Manipulating Emotional Shifts in Response to Narratives

One methodological challenge researchers face when examining causal effects of emotional shifts on narrative processes and effects is the manipulation of emotional shifts. Arguably, the most important source of emotional shifts is the narrative itself, therefore, manipulating narrative content is likely to yield the strongest effects. However, this is also risky, as narratives are complex stimuli and altering structural and content features of it may ultimately change their meaning and alter aspects other than experiences of emotional shifts.

Recent other studies examining the effects of emotional shifts in emotional appeals have manipulated the emotions expressed by the protagonist (Ophir et al., 2021; Sangalang et al., 2019). However, whereas the emotions experienced by the audience might cohere to those

displayed by the protagonist under some conditions (i.e., when identifying with the character; Cohen, 2001; Oatley, 1999), this is not always the case (see Tan, 1995; Zillmann, 2006), therefore this strategy to manipulate emotional shifts might reflect a somewhat narrow understanding of emotional shift experiences. This is also reflected in the results of these studies (emotions experienced reflected the valence rather than the exact emotions by the protagonist, and experiencing the emotions displayed by the character was related to identification).

In Manuscript #3, emotional shift experiences were induced by manipulating the emotional trajectory of narratives: The stimulus stories had identical beginnings and endings in each condition and differed only in their middle parts. The middle parts of the stories described similar events, however, they either affected the protagonist positively or negatively. Great care was taken to keep relevant features of the stories identical, especially the likeability of the protagonists (see Zillmann & Raney, ADT), the length, the coherence and plausibility of the events (see Bilandzic & Busselle, 2011; Green, 2004; Kreuter et al., 2007), and the general message of the stories.

It is unclear if the experience of emotional shifts can be effectively manipulated with external information, similar to review manipulations. The experiments in Manuscript #2 show that prior reviews about the story are suitable to manipulate transportation, but do not affect emotional shifts directly. A recent study by Siegenthaler et al. (2021) shows that altering audiovisual features (e.g., the use of music or dark imagery) might be an effective approach to manipulate emotional shifts without altering the content or information within a stimulus, at least in audiovisual messages. Clearly, developing paradigms for the manipulation of emotional shifts presents an issue that is in need of further research.

11.3.2 Continuous Measurement of the Experience of Emotional Shifts

Continuous measures allow for a fine-grained assessment of dynamic emotional experiences in the moment they occur. Thereby, they avoid different memory biases that are

more likely to occur with retrospective self-report. Process measures also help to avoid common method bias, which describes the phenomenon that the use of the same method (e.g., a self-report scale) to measure two variables may inflate the correlations observed between them (Podsakoff et al., 2003). Most importantly, the methods used in Manuscript #1 and #2 do not interrupt the narrative experience and pose relatively little cognitive demand, meaning that little to no interference with narrative processes are to be expected. In comparison to physiological measures, they present an economic and easy to implement way of capturing emotional shifts.

RTR measurement is best suited as a measurement tool for auditive and audiovisual stimuli, and in research contexts in which emotional responses on a single dimension (or a maximum of two) are sufficient (e.g., valence, sadness, amusement; Hutcherson et al., 2005; Lottridge & Chignell, 2009; Mauss et al., 2005; Siegenthaler et al., 2021). More complex and higher-order affective experiences such as suspense have also been measured using RTR (Bente et al., 2022; Bezdek et al., 2017). This can be somewhat limiting in some instances, as researchers may want to study shifts between several emotions, or capture instances in which emotional experiences are mixed. To a certain degree, this relative drawback can be met by repeating exposure to a stimulus and asking participants to indicate how they had felt during the first round using a different emotion dimension than before (e.g., Mauss et al., 2005; Ruef & Levenson, 2007). However, especially for longer stimuli, this procedure can become tiresome.

The self-probed emotional retrospection method used in Manuscript #2 on the other hand enables researchers to measure emotional experiences throughout a narrative more comprehensively. This method is best suited for text-based narratives (although modifications to suit other presentation modes are also conceivable), and enables researchers to investigate subjectively experienced shifts within, as well as between different emotions, including emotions of similar valence (e.g., sadness and fear). Co-occurring emotional experiences of opposing valence can also be captured.

The pilot study in Manuscript #2 provides some evidence in favor of the construct validity of self-probed emotional retrospections, by showing that people with a higher need for affect (in terms of its approach dimension) also marked more "E"s, which is what one would expect from people with a stronger tendency to seek out emotional experiences. Given a number of refinements, self-probed emotional retrospections proved to be a practicable way to quantify dynamic emotional experiences during narratives. Because people differ greatly in the amount of "E"s they mark during reading, researchers are advised to limit the amount of "E"s for which participants are asked to qualify their emotional experiences after reading. In the pilot study in Manuscript #2, the amount of "E"s varied between 4 and 122, resulting in a large amount of non-random missing values because 50 people were not able to finish the emotion ratings in the allotted timeslot. During reading and while completing the E-marking task, participants should be free to mark as many "E"s as necessary, because keeping track of a predefined amount would most likely interfere with narrative experiences. However, before rating their emotional experiences, it proved useful to include an additional step in which participants select only the most relevant "E"s, which they are then asked to specify. This amount should be large enough to allow people with the most intense experiences to represent all their relevant emotional responses.

11.3.3 Quantifying the Experience of Emotional Shifts: Data-Analytic Strategies

Data generated through RTR measurement and self-probed emotional retrospections lends itself to many different data-analytic strategies, which might accurately represent emotional shifts, but ultimately lead to different results and inform theory about emotional shifts differently. Naturalistic stories such as the ones used in the studies in this thesis usually elicit a wide variety of emotions, resulting from the events in the narrative, their implications for the characters in the story, and audiences' disposition towards them (e.g., Brewer & Lichtenstein, 1980; Mar et al., 2011; Raney, 2011). Stories can also elicit emotional memories or aesthetic

emotions (e.g., Eng, 2002; Hamby et al., 2017; Mar et al., 2011; Menninghaus et al., 2019). All of these emotions might contribute to the experience of emotional shifts during a narrative. Furthermore, the emotions narratives elicit are to a large degree contingent on the specific story. The studies presented here aimed at generalizable statements regarding the relationship of emotional shifts with transportation and story-consistent outcomes, thus, Manuscript #1 and #2 used rather broad measures of emotional shifts that could also be applied to other narratives. Manuscript #3 examines more specific emotional shifts that could be expected from a particular story structure, in terms of experienced shifts in happiness and sadness that were implied by the story events.

To index the extent to which valence varied throughout each of the two films in Manuscript #1, the intra-individual standard deviation of the continuous valence data was used (Ebner-Priemer et al., 2009). Depending on the study aims and the research question, several analytic strategies can be applied using RTR data (see Ruef & Levenson, 2007 for an overview). Ebner-Priemer et al. (2009) compared data analytic strategies of experience sampling data measuring affective dynamics. In cases in which the temporal order of events (i.e., emotional shifts) is irrelevant to the research question (as was the case for the study in Manuscript #1), the authors recommend the use of the standard deviation as an indicator of variability. However, in situations in which specific assumptions about temporal order, amplitude, or frequency of changes exist, an indicator of instability might be preferable (Ebner-Priemer et al., 2009 recommend the mean squared successive difference). This might be the case, for example, if one were to assume that the extent to which emotional shifts intensify over time predicts a particular outcome (e.g., persuasion, or enjoyment). A recent study by Siegenthaler et al. (2021) has also used RTR measurement to capture valence shifts in response to a persuasive video stimulus. In this study, the authors defined a point in the narrative where an emotional shift could be expected. As an indicator of valence shifts, they used the difference score between participants' average valence ratings before and after this point. This strategy lends itself to

contexts in which emotional shifts during specific points in the narrative are of interest. RTR data can also be used for multilevel modelling to analyze the intraindividual relationship of emotional shifts with other variables, provided that these variables were also measured repeatedly (see Lischetzke et al., 2015).

Two indicators of emotional shifts were used in the experiments in Manuscript #2. The first indicator quantifies the number of times the predominantly experienced emotion (or multiple emotions) changed from one "E" to another. The second score indicated the overall intensity of shifts within all emotions throughout the narrative. In terms of their predictive validity, the intensity measure slightly outperformed the number of shifts measure and might therefore be preferable for use in future studies. Although both measures were associated with social sharing intentions in Experiment 2, correlation coefficients for the intensity measure were stronger overall (also when considering the link with transportation). This suggests that the intensity of dynamic emotional experiences might be more critical for narrative engagement and social sharing of emotional experiences than the number of different emotional events, which is in line with previous research on the role of emotions for social sharing (Rimé, 2009).

The goal of the experiments in Manuscript #2 was to explore the utility of two general measures of emotional shifts that could be applied to different stories, within various research contexts, and be compared across studies to facilitate generalizable statements about emotional shifts. In principle, however, self-probed emotional retrospections enable a wide variety of data analytic approaches. Emotions are associated with different action tendencies and appraisal patterns with implications for information processing and persuasive outcomes (Nabi, 1999, 2002, 2015). Therefore, it may be reasonable to look at shifts within or between particular emotions (see Supplement S10 to Manuscript #2 for follow-up analyses), during key events within the narrative (e.g., Appel et al., 2019), or at points in the narrative that are causally relevant to construct the story's message (Dahlstrom, 2010, 2012), depending on the emotions relevant to a story and the specific research question.

11.3.4 Measuring Post-Exposure Self-Reported Emotional Flow

Finally, Manuscripts #1 and #2 also introduce a post-exposure self-report scale of emotional flow. This measure is intended as a general and versatile measure of the overall experience of emotional flow that is abstracted from the experience of particular emotions. The term emotional flow is used to differentiate the scale from measures that reconstruct the experience of emotional shifts from multiple emotion ratings. The scale is applicable to different narratives regardless of their specific structures (and implied emotional shifts), and presentation modes, enabling a comparison of emotional flow experiences across diverse stimuli. It consists of nine items (e.g., "As the story progressed, my emotions changed"; "The story took me on an emotional rollercoaster"; see Supplement to Manuscript #1 for the full measure) with excellent internal consistency across all studies reported in this thesis.

Although whenever possible, a continuous assessment of emotional shifts is ideal, a post-exposure self-report measure of emotional flow might be valuable in some situations. A continuous measure of emotion may not be viable in all research contexts. For example, in studies that also measure other narrative processes, multiple continuous measures could interfere with each other. Other times, an economic measure may be required, for example, because emotional flow is not the main focus of a study, or due to time constraints. It could also be useful when investigating emotional flow experiences that lie further in the past, in which case recollections of specific emotional experience are less accurate (Robinson & Clore, 2002; Walentynowicz et al., 2018). However, people may remember the general emotional flow experience during a narrative better than the dynamics of specific emotions, although at this point, this is an open question for future research.

The studies in Manuscripts #1 and #3 provide some initial support in favor of the scale's construct validity. Manuscript #1 shows that valence shifts captured through RTR measurement are positively correlated with emotional flow across two movies. The pilot study in Manuscript #3 shows that emotional flow is correlated with appreciation and suspense more strongly than

with fun, indicating a relationship with related concepts that are characterized by dynamic emotional experiences. The pilot study and Experiments 1 and 2 further demonstrate moderate correlations of the emotional flow scale with the intensity of shifts in various positive and negative emotions that were relevant to the specific stories (e.g., happiness- and sadness shifts elicited by experimentally manipulated stories in Experiments 1 and 2). Emotional flow was also affected by the experimental manipulation in Experiment 1 and was higher among participants who read a story with an emotional arc designed to elicit emotional shifts in happiness and sadness (compared to an all-positive story version). However, this effect was not found in Experiment 2. Compared to the positive story version in Experiment 1, the positive story in Experiment 2 was more complex and detailed in its description of the protagonist's thoughts and feelings and thus may have engaged audiences emotionally more strongly. More research is needed to address further questions, for example, regarding the scale's construct validity, measurement invariance across different types of stimuli and samples, and its incremental and predictive validity.

11.4 Limitations and Directions for Future Research

This thesis contributes to research on the experience of emotional shifts during narratives both theoretically and methodologically; however, some limitations of the studies presented here need mentioning, which at the same time, point towards avenues for future research.

First, the studies in this thesis focused on capturing emotional shifts using self-report methods, and explored options to measure emotional responses in the moment they occur (Manuscript #1 and #2). This is useful because self-report modes are the likely to be applied within most research contexts, and to improve measurement practices regarding emotional shifts, it is important to develop a tried and tested methodological toolbox. However, methods based on self-reports have their limitations and offer only insight into one component of the

emotional experience: the experience that a person is aware of and is willing to share. Psychophysiological indicators and self-reported emotional experiences might predict narrative effects differently, or may even have predictive advantages for different types of outcomes (e.g., Barraza et al., 2015; Ciuk et al., 2015). Psychophysiological measures do not always cohere with self-reported experiences, which does not necessarily call into question the validity of either of these measures, but rather suggests that there are different underlying processes at play (Bente et al., 2022; Mauss et al., 2005). Constructs measured on the level of self-report (e.g., discrete emotions, suspense, or transportation) are complex experiences, and physiology is only one component that contributes to them. Thus, psychophysiological methods are important complements to understanding self-report data more fully, specifically the physiological and cognitive processes that lead to the experience of emotional shifts (Schmälzle & Grall, 2020).

The methods used in this thesis might be compatible with some physiological measures, for example, skin conductance measurement can be combined with RTR (e.g., Bente et al., 2022; Wagner et al., 2021). Whether or not this is also the case for self-probed emotional retrospections is more difficult to tell, as this method seems more at risk of generating motion artifacts. However, adaptations might be possible and future research exploring this possibility is encouraged.

Another limitation concerns the measurement of transportation through a post-exposure self-report scale. The focus of this thesis was the investigation of emotional shifts as narrative experiences, linking them to transportation and story-consistent outcomes, as well as exploring ways to measure the experience of emotional shifts continuously which could serve as standards for future research. Although continuous measures of transportation and related constructs are being explored (e.g., Bacherle, 2015; Bezdek & Gerrig, 2017; Clayton et al., 2021; Laarni et al., 2015; Nomura et al., 2015; Sukalla, Bilandzic, et al., 2016; Tchernev et al., 2023), this line of research is still developing. This meant that the continuous measurement of emotional shifts (rather than transportation) was a priority. To measure transportation, the studies in this thesis

relied on an established and validated measure, which captures the overall experience of transportation into the story as a whole (Appel et al., 2015).

However, immediate effects of emotional shifts on transportation (or vice versa) may be better observable on an intra-individual level. This notion is underscored by evidence that suggests that transportation might fluctuate throughout a narrative (Bezdek & Gerrig, 2017; Tchernev et al., 2023), which raises the question whether emotional shifts contribute to these fluctuations. Consequently, continuous measures of both transportation and emotional shifts would be ideal to disentangle the dynamics of their relationship. Facets of transportation (e.g., attention) may be captured using psychophysiological indicators (heart rate; Clayton et al., 2021; Sukalla, Bilandzic, et al., 2016), eye blink rate, secondary task reaction times (e.g., Bacherle, 2015; Bezdek & Gerrig, 2017; Nomura et al., 2015), or even using RTR-measurement (Bacherle, 2015; Tchernev, 2022; Tchernev et al., 2023). The use of RTR measurement might present a viable option to measure several different aspects of the experience (Bacherle, 2015). For example, in a study by Tchernev et al. (2023), participants gave continuous responses on one of the facets of transportation (attention, presence, real-world referencing, or self-referencing) during a television drama. Due to the complexity of transportation, these measures are further removed from the overall phenomenon, but present important puzzle pieces to understanding the dynamic relationship between emotional shifts and narrative engagement better.

A task for future research would be to disentangle the dynamics between emotional shifts and transportation more precisely, by including continuous measures in their study designs as well as self-report instruments that allow to differentiate between different dimensions of narrative engagement, such as the narrative engagement scale (Busselle & Bilandzic, 2009). A strong relationship between the emotional engagement dimension of this scale and measures of emotional shifts is to be expected, as the emotional engagement subscale also reflects aspects of the experience of emotional shifts (in a sense of empathy with the

protagonist, see the item “During the program, when a main character succeeded, I felt happy, and when they suffered in some way, I felt sad”; Busselle & Bilandzic, 2009, p. 337). However, the experience of emotional shifts as conceptualized in this research differs, as emotional shifts can result from different processes and structural features of the narrative (see Chapter 4.2). To add further nuance to a theory of emotional shifts, a task for future research would be to determine whether and which kinds of emotional shifts can have explanatory value over and beyond emotional engagement, and which dimensions of narrative engagement (attentional focus, narrative understanding, narrative presence) emotional shifts contribute to. Some recent research has begun to do so. For example, Clayton et al. (2021) found that attention (measured by heart rate) increased after key scenes in self-transcendent video narratives, which also elicited an increase of positive valence (measured by zygomaticus major activation).

Another limitation that needs to be mentioned is the use of retrospective self-report to assess emotional shifts in Manuscript #3. Participants rated the intensity of their experienced emotions after listening to the story based on cues of the three different story parts. This decision was made due to concurrent psychophysiological measurements (skin conductance, heart rate, respiration, which are reported in a different manuscript) and recordings of facial expressions. The use of an “online” self-report measure might have compromised the quality of the physiological data through motion artifacts and also would have increased the demand of an already artificial situation with many parallel physiological measures. Unfortunately, the facial expression data (analyzed using FaceReader 8; Noldus Information Technology, 2019) ended up being inconclusive. Perhaps emotional experiences were not strong enough to result in facial expressions, or facial expression analysis might be less likely to capture emotional expressions of lower intensity. Appel et al. (2019) encountered similar issues in their analysis of facially expressed event-congruent emotions in response to film scenes. They detected event-congruent emotions during some, but not all analyzed scenes of a movie. This finding also points to the possibility that certain stimuli might be more likely to lead to valid and observable facial

expressions than others, for example because they include more emotional cues and are more likely to induce intense emotions (e.g., audiovisual stimuli; Appel et al., 2019), or because they are easier to process (as a concentrated face could sometimes be misattributed as angry; Yu & Ko, 2017). Recent meta-analytic evidence further suggests that coherence between facial expressions and self-report of discrete emotions is rather small (and particularly low for studies based on the FACS), and varies for different emotions (Durán & Fernández-Dols, 2021).

11.5 Conclusion

Research has become increasingly interested in understanding the role of dynamic emotional experiences for narratives effects. However, the majority of studies investigating effects of narratives do no not involve measures of these emotional processes. Thus, little is known so far about the actual experience of dynamic emotions as a mechanism of narrative influence. The manuscripts presented in this thesis address several underexplored questions and methodological challenges associated with emotional shifts research: by exploring ways to measure and manipulate the experience of emotional shifts in response to narratives, by examining the causal relationship between transportation and the experience of emotional shifts, and by investigating their links with story-consistent attitudes, social sharing intentions, and donation behavior.

This research demonstrates that the experience of emotional shifts throughout a narrative is closely intertwined with transportation, as demonstrated by consistent links between the two constructs across various stimuli and using different measures to capture emotional shifts in the moment they occur. The experiments in this thesis help solidify the finding that reviews can affect the degree to which readers become transported into the narrative (Tiede & Appel, 2020), and this in turn is related to the amount and intensity of emotional shifts they experience throughout the narrative. Positive happiness shifts might foster transportation in particular, at least for story structures that reflect a prototypical structure shifting from positive

to negative to positive (“man in a hole”; Reagan et al., 2016; Vonnegut, 1981), or that maintain a positive event structure throughout. Stories with negative shifts were not generally more transporting than positive stories.

With regard to narrative persuasion, this research suggests that effects of emotional shifts might not always be found with regards to story-consistent attitudes immediately after exposure (see also Ophir et al., 2021), but might serve as a starting point for conversations with others (Clayton et al., 2021; Fitzgerald et al., 2020; Peinado, 2015) and contribute to the dissemination of content both online and offline. Research needs to examine further how experiencing emotional shifts during narratives contributes to post-exposure engagement with the narrative, such as reflecting about the story (Hamby et al., 2017, 2018).

Finally, the research presented here contributes methodologically to the field by presenting several viable self-report approaches to measuring emotional shifts in the moment they occur and without interrupting the narrative experience. RTR measurement is suitable to capture shifts on one dimension of emotional experience (e.g., valence). Self-probed emotional retrospections can be utilized for a more comprehensive assessment of several emotion categories while reading text-based narratives. By utilizing different operationalization strategies of emotional shifts, this thesis helps to refine our understanding of the role of emotional shifts during narrative processing and provides avenues for future research interested in these dynamics.

References

Abbott, H. P. (2008). *The Cambridge introduction to narrative* (2nd ed.). Cambridge University Press.

Adams, E. T., Nabi, R. L., Noar, S. M., Evans, R., & Widman, L. (2022). How emotional shifts effect youth perceptions of opioid risk and efficacy: Testing a Know the Truth campaign narrative. *Health Communication*, *37*(14), 1820–1831. https://doi.org/10.1080/10410236.2021.1921349

Ajzen, I., Fishbein, M., Lohmann, S., & Albarracín, D. (2018). The influence of attitudes on behavior. In D. Albarracín & B. T. Johnson (Eds.), *The handbook of attitudes: Volume 1. Basic principles* (pp. 197–255). Routledge.

Alam, N., & So, J. (2020). Contributions of emotional flow in narrative persuasion: An empirical test of the emotional flow framework. *Communication Quarterly*, *68*(2), 161–182. https://doi.org/10.1080/01463373.2020.1725079

Allen, M., & Preiss, R. W. (1997). Comparing the persuasiveness of narrative and statistical evidence using meta-analysis. *Communication Research Reports*, *14*(2), 125–131. https://doi.org/10.1080/08824099709388654

Appel, M. (2008). Fictional narratives cultivate just-world beliefs. *Journal of Communication*, *58*(1), 62–83. https://doi.org/10.1111/j.1460-2466.2007.00374.x

Appel, M., Gnambs, T., & Maio, G. R. (2012). A short measure of the need for affect. *Journal of Personality Assessment*, *94*(4), 418–426. https://doi.org/10.1080/00223891.2012.666921

Appel, M., Gnambs, T., Richter, T., & Green, M. C. (2015). The Transportation Scale – Short Form (TS–SF). *Media Psychology*, *18*(2), 243–266. https://doi.org/10.1080/15213269.2014.987400

Appel, M., Hanauer, D., Hoeken, H., van Krieken, K., Richter, T., & Sanders, J. (2021). The psychological and social effects of literariness: Formal features and paratextual i nformation. In D. Kuiken & A. M. Jacobs (Eds.), *Handbook of empirical literary studies* (pp. 177–202). De Gruyter. https://doi.org/10.1515/9783110645958-008

Appel, M., Krause, S., Gleich, U., & Mara, M. (2016). Meaning through fiction: Science fiction and innovative technologies. *Psychology of Aesthetics, Creativity, and the Arts, 10*(4), 472–480. https://doi.org/10.1037/aca0000052

Appel, M., & Richter, T. (2007). Persuasive effects of fictional narratives increase over time. *Media Psychology*, *10*(1), 113–134. https://doi.org/10.108/15213260701301194

Appel, M., & Richter, T. (2010). Transportation and need for affect in narrative persuasion: A mediated moderation model. *Media Psychology*, *13*(2), 101–135. https://doi.org/10.1080/15213261003799847

Appel, M., Schreiner, C., Haffmans, M.-B., & Richter, T. (2019). The mediating role of event-congruent emotions in narrative persuasion. *Poetics*, *77*, Article 101385. https://doi.org/10.1016/j.poetic.2019.101385

Arbeitsgemeinschaft Verbrauchs- und Medienanalyse. (2022). *Den Markt im Blick. Basisinformationen für fundierte Mediaentscheidungen. VuMA Touchpoints 2022*. ARD–Media GmbH, RMS Radio Marketing Service, ZDF Werbefernsehen. https://www.zdf-

werbefernsehen.de/fileadmin/user_upload/zdfwerb/pdf/studien/VuMA_Berichtsband_2022.pdf

Aristotle. (1994). *Poetics* (S. H. Butcher, Trans.). The Internet Classics Archive. http://classics.mit.edu/Aristotle/poetics.html (Original work published ca. 350 B.C.E)

Bacherle, P. (2015). *Eintauchen in narrative Welten - theoretische und empirische Zugänge zum Rezeptionserleben* [Diving into narrative worlds - theoretical and empirical approaches to audience experience][Doctoral dissertation, Universität Koblenz-Landau]. https://kola.opus.hbz-nrw.de/files/935/Eintauchen_in_narrative_Welten_Theoretische_und_empirische_ZugAnge_zum_Rezeptionserleben.pdf.

Bálint, K., Kuijpers, M. M., & Doicaru, M. M. (2017). The effect of suspense structure on felt suspense and narrative absorption in literature and film. In F. Hakemulder, M. M. Kuijpers, E. S. Tan, K. Bálint, & M. M. Doicaru (Eds.), *Narrative absorption* (pp. 177–197). John Benjamins Publishing Company. https://doi.org/10.1075/lal.27.10bal

Ball, J. G., & Applequist, J. (2019). The use of narratives to deliver information in direct-to-consumer prescription drug commercials: A content analysis. *Journal of Health Communication*, *24*(5), 512–524. https://doi.org/10.1080/10810730.2019.1631915

Bandura, A. (2004). Social cognitive theory for personal and social change by enabling media. In A. Singhal, M. J. Cody, E. M. Rogers, & M. Sabido (Eds.), *Entertainment-education and social change: History, research, and practice* (pp. 75–96). Lawrence Erlbaum.

Barraza, J. A., Alexander, V., Beavin, L. E., Terris, E. T., & Zak, P. J. (2015). The heart of the story: Peripheral physiology during narrative exposure predicts charitable giving. *Biological Psychology*, *105*, 138–143. https://doi.org/10.1016/j.biopsycho.2015.01.008

Barrett, L. F. (2016). Navigating the science of emotion. In H. L. Meiselman (Ed.), *Emotion measurement* (pp. 31–63). Woodhead Publishing. https://doi.org/10.1016/B978-0-08-100508-8.00002-3

Bartsch, A. (2012). Emotional gratification in entertainment experience: Why viewers of movies and television series find it rewarding to experience emotions. *Media Psychology*, *15*(3), 267–302. https://doi.org/10.1080/15213269.2012.693811

Bartsch, A., Kalch, A., & Oliver, M. B. (2014). Moved to think: The role of emotional media experiences in stimulating reflective thoughts. *Journal of Media Psychology: Theories, Methods, and Applications*, *26*(3), 125–140. https://doi.org/10.1027/1864-1105/a000118

Bartsch, A., Vorderer, P., Mangold, R., & Viehoff, R. (2008). Appraisal of emotions in media use: Toward a process model of meta-emotion and emotion regulation. *Media Psychology*, *11*(1), 7–27. https://doi.org/10.1080/15213260701813447

Baumgartner, T., Esslen, M., & Jäncke, L. (2006). From emotion perception to emotion experience: Emotions evoked by pictures and classical music. *International Journal of Psychophysiology*, *60*(1), 34–43. https://doi.org/10.1016/j.ijpsycho.2005.04.007

Behnke, M., Kreibig, S. D., Kaczmarek, L. D., Assink, M., & Gross, J. J. (2022). Autonomic nervous system activity during positive emotions: A meta-analytic review. *Emotion Review*, *14*(2), 132–160. https://doi.org/10.1177/17540739211073084

Bente, G., Kryston, K., Jahn, N. T., & Schmälzle, R. (2022). Building blocks of suspense: Subjective and physiological effects of narrative content and film music. *Humanities and*

Social Sciences Communications, *9*(1), Article 449. https://doi.org/10.1057/s41599-022-01461-5

Berger, J. (2011). Arousal increases social transmission of information. *Psychological Science*, *22*(7), 891–893. https://doi.org/10.1177/0956797611413294

Berger, J., & Milkman, K. L. (2012). What makes online content viral? *Journal of Marketing Research*, *49*(2), 192–205. https://doi.org/10.1509/jmr.10.0353

Betsch, C., Ulshöfer, C., Renkewitz, F., & Betsch, T. (2011). The influence of narrative v. statistical information on perceiving vaccination risks. *Medical Decision Making*, *31*(5), 742–753. https://doi.org/10.1177/0272989X11400419

Bezdek, M. A., & Gerrig, R. J. (2017). When narrative transportation narrows attention: Changes in attentional focus during suspenseful film viewing. *Media Psychology*, *20*(1), 60–89. https://doi.org/10.1080/15213269.2015.1121830

Bezdek, M. A., Gerrig, R. J., Wenzel, W. G., Shin, J., Pirog Revill, K., & Schumacher, E. H. (2015). Neural evidence that suspense narrows attentional focus. *Neuroscience*, *303*, 338–345. https://doi.org/10.1016/j.neuroscience.2015.06.055

Bezdek, M. A., Wenzel, W. G., & Schumacher, E. H. (2017). The effect of visual and musical suspense on brain activation and memory during naturalistic viewing. *Biological Psychology*, *129*, 73–81. https://doi.org/10.1016/j.biopsycho.2017.07.020

Bilandzic, H. (2006). The perception of distance in the cultivation process: A theoretical consideration of the relationship between television content, processing experience, and perceived distance. *Communication Theory*, *16*(3), 333–355. https://doi.org/10.1111/j.1468-2885.2006.00273.x

Bilandzic, H., & Busselle, R. W. (2008). Transportation and transportability in the cultivation of genre-consistent attitudes and estimates. *Journal of Communication*, *58*(3), 508–529. https://doi.org/10.1111/j.1460-2466.2008.00397.x

Bilandzic, H., & Busselle, R. W. (2011). Enjoyment of films as a function of narrative experience, perceived realism and transportability. *Communications*, *36*(1), 29–50. https://doi.org/10.1515/comm.2011.002

Bilandzic, H., Kalch, A., & Soentgen, J. (2017). Effects of goal framing and emotions on perceived threat and willingness to sacrifice for climate change. *Science Communication*, *39*(4), 466–491. https://doi.org/10.1177/1075547017718553

Bilandzic, H., & Sukalla, F. (2019). The role of fictional film exposure and narrative engagement for personal norms, guilt and intentions to protect the climate. *Environmental Communication*, *13*(8), 1069–1086. https://doi.org/10.1080/17524032.2019.1575259

Biocca, F. (2002). The evolution of interactive media: Toward “being there” in nonlinear narrative worlds. In M. C. Green, J. J. Strange, & T. C. Brock (Eds.), *Narrative impact: Social and cognitive foundations* (pp. 97–130). Lawrence Erlbaum.

Biocca, F., David, P., & West, M. (1994). Continuous response measurement (CRM): A computerized tool for research on the cognitive processing of communication messages. In A. Lang (Ed.), *Measuring psychological responses to media messages* (pp. 15–64). Lawrence Erlbaum.

Börsenverein des Deutschen Buchhandels. (2022). *Umsatzanteile der Warengruppen im*

Buchhandel in Deutschland in den Jahren 2020 und 2021 [Chart]. Statista. https://de.statista.com/statistik/daten/studie/71155/umfrage/umsatzanteile-im-buchhandel-im-jahr-2008-nach-genre/

Boster, F. J., & Mongeau, P. (1984). Fear-arousing persuasive messages. *Annals of the International Communication Association*, *8*(1), 330–375. https://doi.org/10.1080/23808985.1984.11678581

Boyd, R. L., Blackburn, K. G., & Pennebaker, J. W. (2020). The narrative arc: Revealing core narrative structures through text analysis. *Science Advances*, *6*(32), Article eaba2196. https://doi.org/10.1126/sciadv.aba2196

Braddock, K., & Price Dillard, J. (2016). Meta-analytic evidence for the persuasive effect of narratives on beliefs, attitudes, intentions, and behaviors. *Communication Monographs*, *83*(4), 446–467. https://doi.org/10.1080/03637751.2015.1128555

Bradley, M. M. (2009). Natural selective attention: Orienting and emotion. *Psychophysiology*, *46*(1), 1–11. https://doi.org/10.1111/j.1469-8986.2008.00702.x

Bradley, M. M., & Lang, P. J. (1994). Measuring emotion: The self-assessment manikin and the semantic differential. *Journal of Behavior Therapy and Experimental Psychiatry*, *25*(1), 49–59. http://www.axessresearch.com/sites/default/files/articles/AffectivePictureSystemSelfMesurement.pdf

Breckler, S. (1984). Empirical validation of affect, behavior, and cognition as distinct components of attitude. *Journal of Personality and Social Psychology*, *47*(6), 1191–1205. https://doi.org/10.1037/0022-3514.47.6.1191

Breves, P., & Schramm, H. (2019). Good for the feelings, bad for the memory: The impact of 3D versus 2D movies on persuasion knowledge and brand placement effectiveness. *International Journal of Advertising*, *38*(8), 1264–1285. https://doi.org/10.1080/02650487.2019.1622326

Brewer, W. F., & Lichtenstein, E. H. (1980). *Event schemas, story schemas, and story grammars*. Center for the Study of Reading. https://hdl.handle.net/2142/17509

Brewer, W. F., & Lichtenstein, E. H. (1982). Stories are to entertain: A structural-affect theory of stories. *Journal of Pragmatics*, *6*(5–6), 473–486. https://doi.org/10.1016/0378-2166(82)90021-2

Bruner, J. (1986). *Actual minds, possible worlds*. Harvard University Press.

Bruner, J. (1990). *Acts of meaning*. Harvard University Press.

Busselle, R., & Bilandzic, H. (2008). Fictionality and perceived realism in experiencing stories: A model of narrative comprehension and engagement. *Communication Theory*, *18*(2), 255–280. https://doi.org/10.1111/j.1468-2885.2008.00322.x

Busselle, R., & Bilandzic, H. (2009). Measuring narrative engagement. *Media Psychology*, *12*(4), 321–347. https://doi.org/10.1080/15213260903287259

Cacioppo, J. T., Berntson, G. G., Larsen, J. T., Poehlmann, K. M., & Ito, T. A. (2000). The psychophysiology of emotion. In M. Lewis & J. M. Haviland-Jones (Eds.), *Handbook of emotions* (2nd ed., pp. 173–191). Guilford Press.

Carrera, P., Caballero, A., & Muñoz, D. (2008). Comparing the effects of negative and mixed emotional messages on predicted occasional excessive drinking. *Substance Abuse:*

Research and Treatment, *1*. https://doi.org/10.1177/117822180800100001

Carrera, P., Muñoz, D., & Caballero, A. (2010). Mixed emotional appeals in emotional and danger control processes. *Health Communication*, *25*(8), 726–736. https://doi.org/10.1080/10410236.2010.521914

Carroll, N. (1997). Art, narrative, and emotion. In M. Hjort & S. Laver (Eds.), *Emotion and the arts* (pp. 190–211). Oxford University Press.

Ciuk, D., Troy, A. K., & Jones, M. C. (2015). Measuring emotion: self-reports vs. physiological indicators. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.2595359

Clayton, R. B., Raney, A. A., Oliver, M. B., Neumann, D., Janicke-Bowles, S. H., & Dale, K. R. (2021). Feeling transcendent? Measuring psychophysiological responses to self-transcendent media content. *Media Psychology*, *24*(3), 359–384. https://doi.org/10.1080/15213269.2019.1700135

Codispoti, M., Surcinelli, P., & Baldaro, B. (2008). Watching emotional movies: Affective reactions and gender differences. *International Journal of Psychophysiology*, *69*(2), 90–95. https://doi.org/10.1016/j.ijpsycho.2008.03.004

Cohen, J. (2001). Defining identification: A theoretical look at the identification of audiences with media characters. *Mass Communication & Society*, *4*(3), 245–264. https://doi.org/http://dx.doi.org/10.1207/S15327825MCS0403_01

Cohen, J., & Tal-Or, N. (2017). Antecedents of identification. Character, text, and audiences. In F. Hakemulder, M. M. Kuijpers, E. S.-H. Tan, K. Bálint, & M. M. Doicaru (Eds.), *Narrative absorption* (pp. 133–153). John Benjamins. https://doi.org/10.1075/lal.27.08coh

Cohn, J. F., & Ekman, P. (2005). Measuring facial action. In J. A. Harrigan, R. Rosenthal, & K. R. Scherer (Eds.), *The new handbook of methods in nonverbal behavior research* (pp. 9–64). Oxford University Press.

Comberg, D. (2010, October 30). *Kurt Vonnegut on the shapes of stories* [Video]. YouTube. https://www.youtube.com/watch?v=oP3c1h8v2ZQ

Csíkszentmihályi, M. (1990). *Flow: The psychology of optimal experience*. Harper Collins.

Cupchik, G. C. (2011). The role of feeling in the entertainment=emotion formula. *Journal of Media Psychology*, *23*(1), 6–11. https://doi.org/10.1027/1864-1105/a000025

Cupchik, G. C., Oatley, K., & Vorderer, P. (1998). Emotional effects of reading excerpts from short stories by James Joyce. *Poetics*, *25*(6), 363–377. https://doi.org/10.1016/S0304-422X(98)00004-7

Cutting, J. E. (2016). Narrative theory and the dynamics of popular movies. *Psychonomic Bulletin & Review*, *23*(6), 1713–1743. https://doi.org/10.3758/s13423-016-1051-4

Dahlstrom, M. F. (2010). The role of causality in information acceptance in narratives: An example from science communication. *Communication Research*, *37*(6), 857–875. https://doi.org/10.1177/0093650210362683

Dahlstrom, M. F. (2012). The persuasive influence of narrative causality: Psychological mechanism, strength in overcoming resistance, and persistence over time. *Media Psychology*, *15*(3), 303–326. https://doi.org/10.1080/15213269.2012.702604

Dahlstrom, M. F. (2014). Using narratives and storytelling to communicate science with

nonexpert audiences. *Proceedings of the National Academy of Sciences*, *111*(Supplement 4), 13614–13620. https://doi.org/10.1073/pnas.1320645111

Daly, I., Malik, A., Hwang, F., Roesch, E., Weaver, J., Kirke, A., Williams, D., Miranda, E., & Nasuto, S. J. (2014). Neural correlates of emotional responses to music: An EEG study. *Neuroscience Letters*, *573*, 52–57. https://doi.org/10.1016/j.neulet.2014.05.003

de Graaf, A., Hoeken, H., Sanders, J., & Beentjes, H. (2009). The role of dimensions of narrative engagement in narrative persuasion. *Communications*, *34*(4), 385–405. https://doi.org/10.1515/COMM.2009.024

de Graaf, A., & Hustinx, L. (2011). The effect of story structure on emotion, transportation, and persuasion. *Information Design Journal*, *19*(2), 142–154. https://doi.org/10.1075/idj.19.2.05gra

del Vecchio, M., Kharlamov, A., Parry, G., & Pogrebna, G. (2021). Improving productivity in Hollywood with data science: Using emotional arcs of movies to drive product and service innovation in entertainment industries. *Journal of the Operational Research Society*, *72*(5), 1110–1137. https://doi.org/10.1080/01605682.2019.1705194

Dill-Shackleford, K. E., Vinney, C., & Hopper-Losenicky, K. (2016). Connecting the dots between fantasy and reality: The social psychology of our engagement with fictional narrative and its functional value. *Social and Personality Psychology Compass*, *10*(11), 634–646. https://doi.org/10.1111/spc3.12274

Dillard, J. P., & Nabi, R. L. (2006). The persuasive influence of emotion in cancer prevention and detection messages. *Journal of Communication*, *56*(Suppl. 1), S123–S139. https://doi.org/10.1111/j.1460-2466.2006.00286.x

Dixon, P., & Bortolussi, M. (2009). Readers' knowledge of popular genre. *Discourse Processes*, *46*(6), 541–571. https://doi.org/10.1080/01638530902959570

Dobele, A., Lindgreen, A., Beverland, M., Vanhamme, J., & van Wijk, R. (2007). Why pass on viral messages? Because they connect emotionally. *Business Horizons*, *50*(4), 291–304. https://doi.org/10.1016/j.bushor.2007.01.004

Donald, M. (1991). *Origins of the modern mind. Three stages in the evolution of culture and cognition.* Harvard University Press.

Dunlop, S. M. (2011). Talking "truth": Predictors and consequences of conversations about a youth antismoking campaign for smokers and nonsmokers. *Journal of Health Communication*, *16*(7), 708–725. https://doi.org/10.1080/10810730.2011.552000

Dunlop, S. M., Wakefield, M., & Kashima, Y. (2010). Pathways to persuasion: Cognitive and experiential responses to health-promoting mass media messages. *Communication Research*, *37*(1), 133–164. https://doi.org/10.1177/0093650209351912

Durán, J. I., & Fernández-Dols, J.-M. (2021). Do emotions result in their predicted facial expressions? A meta-analysis of studies on the co-occurrence of expression and emotion. *Emotion*, *21*(7), 1550–1569. https://doi.org/10.1037/emo0001015

Ebner-Priemer, U. W., Eid, M., Kleindienst, N., Stabenow, S., & Trull, T. J. (2009). Analytic strategies for understanding affective (in)stability and other dynamic processes in psychopathology. *Journal of Abnormal Psychology*, *118*(1), 195–202. https://doi.org/10.1037/a0014868

Ekman, P. (1993). Facial expression and emotion. *American Psychologist*, *48*(4), 384–392.

https://doi.org/10.1037/0003-066X.48.4.384

Ekman, P., & Friesen, W. V. (1978). *Facial acttion coding system: A technique for the measurement of facial movement*. Consulting Psychologists Press.

Ellsworth, P. C., & Scherer, K. R. (2003). Appraisal processes in emotion. In R. J. Davidson, K. R. Scherer, & H. H. Goldsmith (Eds.), *Handbook of affective sciences* (pp. 572–595). Oxford University Press.

Eng, A. (2002). *Learning and processing nonfiction expository and narrative genre* (Publication No. 54972469) [Doctoral dissertation, University of Toronto]. National Library of Canada.

Fabrigar, L. R., & Petty, R. E. (1999). The role of the affective and cognitive bases of attitudes in susceptibility to affectively and cognitively based persuasion. *Personality and Social Psychology Bulletin*, *25*(3), 363–381. https://doi.org/10.1177/0146167299025003008

Fahr, A., & Hofer, M. (2013). Psychophysiologische Messmethoden. In W. Möhring & D. Schlütz (Eds.), *Handbuch standardisierte Erhebungsverfahren in der Kommunikationswissenschaft* (pp. 347–365). https://doi.org/10.1007/978-3-531-18776-1

Field, S. (2005). *Screenplay. The foundations of screenwriting* (Rev. ed.). Bantam Dell.

Fishbein, M. (1980). A theory of reasoned action: Some applications and implications. *Nebraska Symposium on Motivation*, *27*, 65–116.

Fisher, J. T., Keene, J. R., Huskey, R., & Weber, R. (2018). The limited capacity model of motivated mediated message processing: Taking stock of the past. *Annals of the International Communication Association*, *42*(4), 270–290. https://doi.org/10.1080/23808985.2018.1534552

Fitzgerald, K., Paravati, E., Green, M. C., Moore, M. M., & Qian, J. L. (2020). Restorative narratives for health promotion. *Health Communication*, *35*(3), 356–363. https://doi.org/10.1080/10410236.2018.1563032

Fludernik, M. (2009). *An introduction to narratology*. Routledge. https://doi.org/10.4324/9780203882887

Frank, L. B., Chatterjee, J. S., Chaudhuri, S. T., Lapsansky, C., Bhanot, A., & Murphy, S. T. (2012). Conversation and compliance: Role of interpersonal discussion and social norms in public communication campaigns. *Journal of Health Communication*, *17*(9), 1050–1067. https://doi.org/10.1080/10810730.2012.665426

Freytag, G. (1905). *Die Technik des Dramas [Technique of the drama]* (10th ed.). Hirzel. https://www.gutenberg.org/files/50616/50616-h/50616-h.htm

Fridlund, A. J., & Cacioppo, J. T. (1986). Guidelines for human electromyographic research. *Psychophysiology*, *23*(5), 567–589. https://doi.org/10.1111/j.1469-8986.1986.tb00676.x

Frijda, N. H. (2007). *The laws of emotion*. Lawrence Erlbaum.

Frijda, N. H. (2008). The psychologists' point of view. In M. Lewis, J. M. Haviland-Jones, & L. F. Barrett (Eds.), *Handbook of emotions* (3rd ed., pp. 68–87). The Guilford Press.

Gebbers, T., De Wit, J. B. F., & Appel, M. (2017). Transportation into narrative worlds and the motivation to change health-related behavior. *International Journal of Communication, 11*, 4886-4906. http://ijoc.org/index.php/ijoc

Gerrig, R. J. (1993). *Experiencing narrative worlds: On the psychological activities of reading*. Yale University Press.

Gnambs, T., Appel, M., Schreiner, C., Richter, T., & Isberner, M.-B. (2014). Experiencing narrative worlds: A latent state-trait analysis. *Personality and Individual Differences*, *69*, 187–192. https://doi.org/10.1016/j.paid.2014.05.034

Graton, A., & Mailliez, M. (2019). A theory of guilt appeals: A review showing the importance of investigating cognitive processes as mediators between emotion and behavior. *Behavioral Sciences*, *9*(12), Article 117. https://doi.org/10.3390/bs9120117

Green, M. C. (2004). Transportation into narrative worlds: The role of prior knowledge and perceived realism. *Discourse Processes*, *38*(2), 247–266. https://doi.org/http://dx.doi.org/10.1207/s15326950dp3802_5

Green, M. C., Bilandzic, H., Fitzgerald, K., & Paravati, E. (2020). Narrative effects. In M. B. Oliver, A. A. Raney, & J. Bryant (Eds.), *Media effects: Advances in theory and research* (4th ed., pp. 130–145). Routledge.

Green, M. C., & Brock, T. C. (2000). The role of transportation in the persuasiveness of public narratives. *Journal of Personality and Social Psychology*, *79*(5), 701–721. https://doi.org/10.1037//0022-3514.79.5.701

Green, M. C., & Brock, T. C. (2002). In the mind's eye: Transportation-imagery model of narrative persuasion. In M. C. Green, J. J. Strange, & T. C. Brock (Eds.), *Narrative impact: Social and cognitive foundations* (pp. 315–341). Lawrence Erlbaum.

Grodal, T. (1999). *Moving pictures. A new theory of film, genres, feelings, and cognition.* Oxford University Press. https://doi.org/10.1093/acprof:oso/9780198159834.001.0001

Guido, G., Pichierri, M., & Pino, G. (2018). Place the good after the bad: Effects of emotional shifts on consumer memory. *Marketing Letters*, *29*(1), 49–60. https://doi.org/10.1007/s11002-017-9439-0

Haidt, J. (2003). The moral emotions. In R. J. Davidson, K. R. Scherer, & H. H. Goldsmith (Eds.), *Handbook of affective sciences* (pp. 852–870). Oxford University Press.

Hamby, A., & Brinberg, D. (2016). Happily ever after: How ending valence influences narrative persuasion in cautionary stories. *Journal of Advertising*, *45*(4), 498–508. https://doi.org/10.1080/00913367.2016.1262302

Hamby, A., Brinberg, D., & Daniloski, K. (2017). Reflecting on the journey: Mechanisms in narrative persuasion. *Journal of Consumer Psychology*, *27*(1), 11–22. https://doi.org/10.1016/j.jcps.2016.06.005

Hamby, A., Brinberg, D., & Jaccard, J. (2018). A conceptual framework of narrative persuasion. *Journal of Media Psychology*, *30*(3), 113–124. https://doi.org/10.1027/1864-1105/a000187

Hamby, A., Shawver, Z., & Moreau, P. (2020). How character goal pursuit "moves" audiences to share meaningful stories. *Media Psychology*, *23*(3), 317–341. https://doi.org/10.1080/15213269.2019.1601569

Healey, M. L., & Grossman, M. (2018). Cognitive and affective perspective-taking: Evidence for shared and dissociable anatomical substrates. *Frontiers in Neurology*, *9*, Article 491. https://doi.org/10.3389/fneur.2018.00491

Hinyard, L. J., & Kreuter, M. W. (2007). Using narrative communication as a tool for health

behavior change: A conceptual, theoretical, and empirical overview. *Health Education and Behavior*, *34*(5), 777–792. https://doi.org/10.1177/1090198106291963

Hoeken, H., & den Ouden, H. (2019). Narrative health communication. In H. Vandebosch & L. Green (Eds.), *Narratives in research and interventions on cyberbullying among young people* (pp. 61–74). Springer International Publishing. https://doi.org/10.1007/978-3-030-04960-7

Hoeken, H., & Sinkeldam, J. (2014). The role of identification and perception of just outcome in evoking emotions in narrative persuasion. *Journal of Communication*, *64*(5), 935–955. https://doi.org/10.1111/jcom.12114

Hoeken, H., & van Vliet, M. (2000). Suspense, curiosity, and surprise: How discourse structure influences the affective and cognitive processing of a story. *Poetics*, *27*(4), 277–286. https://doi.org/10.1016/S0304-422X(99)00021-2

Hutcherson, C. A., Goldin, P. R., Ochsner, K. N., Gabrieli, J. D., Feldman Barrett, L., & Gross, J. J. (2005). Attention and emotion: Does rating emotion alter neural responses to amusing and sad films? *NeuroImage*, *27*(3), 656–668. https://doi.org/10.1016/j.neuroimage.2005.04.028

Hwang, Y. (2012). Social diffusion of campaign effects: Campaign-generated interpersonal communication as a mediator of antitobacco campaign effects. *Communication Research*, *39*(1), 120–141. https://doi.org/10.1177/0093650210389029

Isberner, M.-B., Richter, T., Schreiner, C., Eisenbach, Y., Sommer, C., & Appel, M. (2019). Empowering stories: Transportation into narratives with strong protagonists increases self-related control beliefs. *Discourse Processes*, *56*(8), 575–598. https://doi.org/10.1080/0163853X.2018.1526032

Izard, C. E. (1992). Basic emotions, relations among emotions, and emotion-cognitive relations. *Psychological Review*, *99*(3), 561–565. https://doi.org/10.1037/0033-295X.99.3.561

Janicke, S. H., & Raney, A. A. (2015). Exploring the role of identification and moral disengagement in the enjoyment of an antihero television series. *Communications*, *40*(4), 485–495. https://doi.org/10.1515/commun-2015-0022

Janicke, S. H., & Raney, A. A. (2018). Modeling the antihero narrative enjoyment process. *Psychology of Popular Media Culture*, *7*(4), 533–546. https://doi.org/10.1037/ppm0000152

Kalch, A., & Bilandzic, H. (2017). The narrative within the narrative: The effectiveness of narrative HIV prevention ads depends on their placement within a context narrative. *International Journal of Communication*, *11*, 5048–5067. https://ijoc.org/index.php/ijoc/article/view/7106/2211

Katz, E., & Lazarsfeld, P. F. (1955). *Personal influence: The part played by people in the flow of mass communications*. Free Press.

Keene, J. R., & Lang, A. (2016). Dynamic motivated processing of emotional trajectories in public service announcements. *Communication Monographs*, *83*(4), 468–485. https://doi.org/10.1080/03637751.2016.1198040

Keer, M., van den Putte, B., de Wit, J., & Neijens, P. (2013). The effects of integrating instrumental and affective arguments in rhetorical and testimonial health messages. *Journal of Health Communication*, *18*(9), 1148–1161.

https://doi.org/10.1080/10810730.2013.768730

Kleinginna, P. R., & Kleinginna, A. M. (1981). A categorized list of motivation definitions, with a suggestion for a consensual definition. *Motivation and Emotion*, *5*(3), 263–291. https://doi.org/10.1007/BF00993889

Knobloch-Westerwick, S. (2006). Mood management: Theory, evidence, and advancements. In B. Paul & P. Vorderer (Eds.), *Psychology of entertainment* (pp. 239–254). Lawrence Erlbaum.

Kock, M., & Louven, C. (2018). The power of sound design in a moving picture: An empirical study with emoTouch for iPad. *Empirical Musicology Review*, *13*(3–4), 132. https://doi.org/10.18061/emr.v13i3-4.6572

Koopman, E. M. (2016). Effects of "literariness" on emotions and on empathy and reflection after reading. *Psychology of Aesthetics, Creativity, and the Arts*, *10*(1), 82–98. https://doi.org/10.1037/aca0000041

Kopfman, J. E., Smith, S. W., Ah Yun, J. K., & Hodges, A. (1998). Affective and cognitive reactions to narrative versus statistical evidence organ donation messages. *Journal of Applied Communication Research*, *26*(3), 279–300. https://doi.org/10.1080/00909889809365508

Krakow, M. M., Yale, R. N., Jensen, J. D., Carcioppolo, N., & Ratcliff, C. L. (2018). Comparing mediational pathways for narrative- and argument-based messages: Believability, counterarguing, and emotional reaction. *Human Communication Research*, *44*(3), 299–321. https://doi.org/10.1093/hcr/hqy002

Krause, S., & Appel, M. (2020). Stories and the self. Assimilation, contrast, and the role of being transported into the narrative world. *Journal of Media Psychology*, *32*(2), 47–58. https://doi.org/10.1027/1864-1105/a000255

Kreibig, S. D. (2010). Autonomic nervous system activity in emotion: A review. *Biological Psychology*, *84*(3), 394–421. https://doi.org/10.1016/j.biopsycho.2010.03.010

Kreuter, M. W., Green, M. C., Cappella, J. N., Slater, M. D., Wise, M. E., Storey, D., Clark, E. M., O'Keefe, D. J., Erwin, D. O., Holmes, K., Hinyard, L. J., Houston, T., & Woolley, S. (2007). Narrative communication in cancer prevention and control: A framework to guide research and application. *Annals of Behavioral Medicine*, *33*(3), 221–235. https://doi.org/10.1007/BF02879904

Kuijpers, M. M., Hakemulder, F., Tan, E. S., & Doicaru, M. M. (2014). Exploring absorbing reading experiences: Developing and validating a self–report scale to measure story world absorption. *Scientific Study of Literature*, *4*(1), 89–122. https://doi.org/10.1075/ssol.4.1.05kui

Laarni, J., Ravaja, N., Saari, T., Böcking, S., Hartmann, T., & Schramm, H. (2015). Ways to measure spatial presence: Review and future directions. In M. Lombard, F. Biocca, J. Freeman, W. IJsselsteijn, & R. J. Schaevitz (Eds.), *Immersed in media* (pp. 139–185). Springer International Publishing. https://doi.org/10.1007/978-3-319-10190-3_8

Lang, A. (2000). The limited capacity model of mediated message processing. *Journal of Communication*, *50*(1), 46–70. https://doi.org/10.1111/j.1460-2466.2000.tb02833.x

Lang, A. (2006). Using the limited capacity model of motivated mediated message processing to design effective cancer communication messages. *Journal of Communication*, *56*(Suppl. 1), S57–S80. https://doi.org/10.1111/j.1460-2466.2006.00283.x

Lang, A. (2017). Limited capacity model of motivated mediated message processing (LC4MP). In P. Rössler, C. A. Hoffner, & L. van Zoonen (Eds.), *The international encyclopedia of media effects*. Wiley. https://doi.org/10.1002/9781118783764.wbieme0077

Lang, A., & Ewoldsen, D. R. (2011). The measurement of positive and negative affect in media research. In K. Döveling, C. von Scheve, & E. A. Konijn (Eds.), *The Routledge handbook of emotions and mass media* (pp. 79–98). Routledge.

Lang, A., Sanders-Jackson, A., Wang, Z., & Rubenking, B. (2013). Motivated message processing: How motivational activation influences resource allocation, encoding, and storage of TV messages. *Motivation and Emotion*, *37*(3), 508–517. https://doi.org/10.1007/s11031-012-9329-y

Lange, J., & Zickfeld, J. H. (2021). Emotions as overlapping causal networks of emotion components: Implications and methodological approaches. *Emotion Review*, *13*(2), 157–167. https://doi.org/10.1177/1754073920988787

Larsen, J. T., Berntson, G. G., Poehlmann, K. M., Ito, T. A., & Cacioppo, J. T. (2008). The psychophysiology of emotion. In M. Lewis, J. M. Haviland-Jones, & L. F. Barrett (Eds.), *The handbook of emotions* (3rd ed., pp. 180–195). Guilford Press.

Larsen, J. T., Norris, C. J., & Cacioppo, J. T. (2003). Effects of positive and negative affect on electromyographic activity over zygomaticus major and corrugator supercilii. *Psychophysiology*, *40*(5), 776–785. https://doi.org/10.1111/1469-8986.00078

Larsen, S. F., & Seilman, U. (1988). Personal remindings while reading literature. *Text*, *8*(4), 411–429. https://doi.org/10.1515/text.1.1988.8.4.411

Lazarsfeld, P. F., & Merton, R. K. (1943). Section of anthropology: Studies in radio and film propaganda. *Transactions of the New York Academy of Sciences*, *6*(2 Series II), 58–74. https://doi.org/10.1111/j.2164-0947.1943.tb00897.x

Lazarus, R. S. (1991). *Emotion and adaptation*. Oxford University Press.

Lee, Seungjo, & Lang, A. (2009). Discrete emotion and motivation: Relative activation in the appetitive and aversive motivational systems as a function of anger, sadness, fear, and joy during televised information campaigns. *Media Psychology*, *12*(2), 148–170. https://doi.org/10.1080/15213260902849927

Lee, Sungkyoung, & Potter, R. F. (2020). The impact of emotional words on listeners' emotional and cognitive responses in the context of advertisements. *Communication Research*, *47*(8), 1155–1180. https://doi.org/10.1177/0093650218765523

Leiner, D., Fahr, A., & Früh, H. (2012). EDA positive change: A simple algorithm for electrodermal activity to measure general audience arousal during media exposure. *Communication Methods and Measures*, *6*(4), 237–250. https://doi.org/10.1080/19312458.2012.732627

Lewinski, P. (2015a). Automated facial coding software outperforms people in recognizing neutral faces as neutral from standardized datasets. *Frontiers in Psychology*, *6*, Article 1386. https://doi.org/10.3389/fpsyg.2015.01386

Lewinski, P. (2015b). Don''t look blank, happy, or sad: Patterns of facial expressions of speakers in Banks' YouTube videos predict video's popularity over time. *Journal of Neuroscience, Psychology, and Economics, 8*(4), 241–249. https://doi.org/10.1037/npe0000046

Lewinski, P., Fransen, M. L., & Tan, E. S.-H. (2014). Predicting advertising effectiveness by facial expressions in response to amusing persuasive stimuli. *Journal of Neuroscience, Psychology, and Economics*, *7*(1), 1–14. https://doi.org/10.1037/npe0000012

Lischetzke, T., Reis, D., & Arndt, C. (2015). Data-analytic strategies for examining the effectiveness of daily interventions. *Journal of Occupational and Organizational Psychology*, *88*(3), 587–622. https://doi.org/10.1111/joop.12104

Lottridge, D., & Chignell, M. (2009). Emotrace: Tracing emotions through human-system interaction. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting, 53*(19), 1541–1545. https://doi.org/10.1518/107118109x12524444079992

Lottridge, D., & Chignell, M. (2010). Sliders rate valence but not arousal: Psychometrics of self-reported emotion assessment. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*, *54*(20), 1766–1770. https://doi.org/10.1177/154193121005402005

Lu, H., & Yuan, S. (2022). Exploring the sequencing effects of fear-hope appeals on promoting MMR vaccination. *Health Communication.* Advance online publication. https://doi.org/10.1080/10410236.2022.2054229

Maier, J., Maurer, M., Reinemann, C., & Faas, T. (2007). Reliability and validity of real-time response measurement: A comparison of two studies of a televised debate in Germany. *International Journal of Public Opinion Research*, *19*(1), 53–73. https://doi.org/10.1093/ijpor/edl002

Maier, J., Rittberger, B., & Faas, T. (2016). Debating Europe: Effects of the "Eurovision debate" on EU attitudes of young German voters and the moderating role played by political involvement. *Politics and Governance*, *4*(1), 55–68. https://doi.org/10.17645/pag.v4i1.456

Mar, R. A., Oatley, K., Djikic, M., & Mullin, J. (2011). Emotion and narrative fiction: Interactive influences before, during, and after reading. *Cognition and Emotion*, *25*(5), 818–833. https://doi.org/10.1080/02699931.2010.515151

Mar, R. A., Oatley, K., & Peterson, J. B. (2009). Exploring the link between reading fiction and empathy: Ruling out individual differences and examining outcomes. *Communications*, *34*(4), 407–428. https://doi.org/10.1515/COMM.2009.025

Martínez-Navarro, J., & Bigné, E. (2022). Sponsored consumer-generated advertising in the digital era: What prompts individuals to generate video ads, and what creative strategies do they adopt? *International Journal of Advertising*, *41*(4), 623–654. https://doi.org/10.1080/02650487.2021.1972586

Matei, S. A., & Hunter, L. (2021). Data storytelling is not storytelling with data: A framework for storytelling in science communication and data journalism. *The Information Society*, *37*(5), 312–322. https://doi.org/10.1080/01972243.2021.1951415

Maurer, T., Wagner, M., & Weiß, H. (2022). Programmprofile von Das Erste, ZDF, RTL, VOX, Sat.1 und ProSieben. *Media Perspektiven*, *5*, 221–242.

Mauss, I. B., Levenson, R. W., McCarter, L., Wilhelm, F. H., & Gross, J. J. (2005). The tie that binds? Coherence among emotion experience, behavior, and physiology. *Emotion*, *5*(2), 175–190. https://doi.org/10.1037/1528-3542.5.2.175

Mauss, I. B., & Robinson, M. D. (2009). Measures of emotion: A review. *Cognition and Emotion*, *23*(2), 209–237. https://doi.org/10.1080/02699930802204677

Mazzocco, P. J., Green, M. C., Sasota, J. A., & Jones, N. W. (2010). This story is not for everyone: Transportability and narrative persuasion. *Social Psychological and Personality Science*, *1*(4), 361–368. https://doi.org/10.1177/1948550610376600

Menninghaus, W., Wagner, V., Wassiliwizky, E., Schindler, I., Hanich, J., Jacobsen, T., & Koelsch, S. (2019). What are aesthetic emotions? *Psychological Review*, *126*(2), 171–195. https://doi.org/10.1037/rev0000135

Miall, D. S., & Kuiken, D. (2002). A feeling for fiction: Becoming what we behold. *Poetics*, *30*(4), 221–241. https://doi.org/10.1016/S0304-422X(02)00011-6

Moyer-Gusé, E. (2008). Toward a theory of entertainment persuasion: Explaining the persuasive effects of entertainment-education messages. *Communication Theory*, *18*(3), 407–425. https://doi.org/10.1111/j.1468-2885.2008.00328.x

Moyer-Gusé, E., & Nabi, R. L. (2010). Explaining the effects of narrative in an entertainment television program: Overcoming resistance to persuasion. *Human Communication Research*, *36*(1), 26–52. https://doi.org/10.1111/j.1468-2958.2009.01367.x

Mulligan, K., & Scherer, K. R. (2012). Toward a working definition of emotion. *Emotion Review*, *4*(4), 345–357. https://doi.org/10.1177/1754073912445818

Murphy, S. T., Frank, L. B., Chatterjee, J. S., & Baezconde-Garbanati, L. (2013). Narrative versus nonnarrative: The role of identification, transportation, and emotion in reducing health disparities. *Journal of Communication*, *63*(1), 116–137. https://doi.org/10.1111/jcom.12007

Murphy, S. T., Frank, L. B., Moran, M. B., & Patnoe-Woodley, P. (2011). Involved, transported, or emotional? Exploring the determinants of change in knowledge, attitudes, and behavior in entertainment-education. *Journal of Communication*, *61*(3), 407–431. https://doi.org/10.1111/j.1460-2466.2011.01554.x

Nabi, R. L. (1999). A cognitive-functional model for the effects of discrete negative emotions on information processing, attitude change, and recall. *Communication Theory*, *9*(3), 292–320. https://doi.org/10.1111/j.1468-2885.1999.tb00172.x

Nabi, R. L. (2002). Discrete emotions and persuasion. In J. Price Dillard & M. Pfau (Eds.), *The persuasion handbook: Developments in theory and practice* (pp. 289–308). Sage. https://doi.org/10.4135/9781412976046.n15

Nabi, R. L. (2003). Exploring the framing effects of emotion: Do discrete emotions differentially influence information accessibility, information seeking, and policy preference? *Communication Research*, *30*(2), 224–247. https://doi.org/10.1177/0093650202250881

Nabi, R. L. (2015). Emotional flow in persuasive health messages. *Health Communication*, *30*(2), 114–124. https://doi.org/10.1080/10410236.2014.974129

Nabi, R. L., Finnerty, K., Domschke, T., & Hull, S. (2006). Does misery love company? Exploring the therapeutic effects of TV viewing on regretted experiences. *Journal of Communication*, *56*(4), 689–706. https://doi.org/10.1111/j.1460-2466.2006.00315.x

Nabi, R. L., & Green, M. C. (2015). The role of a narrative's emotional flow in promoting persuasive outcomes. *Media Psychology*, *18*(2), 137–162. https://doi.org/10.1080/15213269.2014.912585

Nabi, R. L., Gustafson, A., & Jensen, R. (2018). Framing climate change: Exploring the role

of emotion in generating advocacy behavior. *Science Communication*, *40*(4), 442–468. https://doi.org/10.1177/1075547018776019

Nee, R. C., & Santana, A. D. (2022). Podcasting the pandemic: Exploring storytelling formats and shifting journalistic norms in news podcasts related to the coronavirus. *Journalism Practice*, *16*(8), 1559–1577. https://doi.org/10.1080/17512786.2021.1882874

Nell, V. (1988). *Lost in a book: The psychology of reading for pleasure*. Yale University Press. https://doi.org/10.2307/j.ctt1ww3vk3

Nickerson, R. S. (1998). Confirmation bias: a ubiquitous phenomenon in many guises. *Review of General Psychology*, *2*(2), 175–220. https://doi.org/10.1037/1089-2680.2.2.175

Noldus Information Technology. (2019). *FaceReader* (Version 8) [Computer software].

Nomura, R., Hino, K., Shimazu, M., Liang, Y., & Okada, T. (2015). Emotionally excited eyeblink-rate variability predicts an experience of transportation into the narrative world. *Frontiers in Psychology*, *6*, Article 447. https://doi.org/10.3389/fpsyg.2015.00447

O'Keefe, D. J. (2000). Guilt and social influence. *Annals of the International Communication Association*, *23*(1), 67–101. https://doi.org/10.1080/23808985.2000.11678970

Oatley, K. (1995). A taxonomy of the emotions of literary response and a theory of identification in fictional narrative. *Poetics*, *23*(1), 53–74. https://doi.org/10.1016/0304-422X(94)P4296-S

Oatley, K. (1999). Meetings of minds: Dialogue, sympathy, and identification, in reading fiction. *Poetics*, *26*(5–6), 439–454. https://doi.org/10.1016/S0304-422X(99)00011-X

Oatley, K. (2012). *The passionate muse. Exploring emotion in stories*. Oxford University Press.

Oatley, K., & Duncan, E. (1994). The experience of emotions in everyday life. *Cognition and Emotion*, *8*(4), 369–381. https://doi.org/10.1080/02699939408408947

Oatley, K., & Johnson-Laird, P. N. (1987). Towards a cognitive theory of emotions. *Cognition and Emotion*, *1*(1), 29–50. https://doi.org/10.1080/02699938708408362

Oceja, L., & Carrera, P. (2009). Beyond a single pattern of mixed emotional experience: Sequential, prevalence, inverse, and simultaneous. *European Journal of Psychological Assessment*, *25*(1), 58–67. https://doi.org/10.1027/1015-5759.25.1.58

Oliver, M. B., & Bartsch, A. (2010). Appreciation as audience response: Exploring entertainment gratifications beyond hedonism. *Human Communication Research*, *36*(1), 53–81. https://doi.org/10.1111/j.1468-2958.2009.01368.x

Oliver, M. B., Raney, A. A., Bartsch, A., Janicke-Bowles, S., Appel, M., & Dale, K. (2021). Model of inspiring media. *Journal of Media Psychology*, *33*(4), 191–201. https://doi.org/10.1027/1864-1105/a000305

Ophir, Y., Sangalang, A., & Cappella, J. N. (2021). The emotional flow hypothesis in entertainment-education narratives: Theory, empirical evidence, and open questions. In L. B. Frank & P. Falzone (Eds.), *Entertainment-Education Behind the Scenes* (pp. 103–120). Palgrave Macmillan. https://doi.org/10.1007/978-3-030-63614-2

Ort, A., Reinhardt, A., Koch, L., & Rossmann, C. (2023). The emotional effects of gain-loss frames in persuasive messages about sun protection on health promotional outcomes: Evidence from an experimental study. *Health Communication*, *38*(3), 512–521.

https://doi.org/10.1080/10410236.2021.1956072

Ortony, A., Clore, G. L., & Collins, A. (1988). *The cognitive structure of emotions*. Cambridge University Press. https://doi.org/10.1017/CBO9780511571299

Peinado, S. C. (2015). *The use of emotional shifts in health messages as a strategy for generating talk and promoting attitude, belief, and behavior change* [Doctoral dissertation, University of California at Santa Barbara]. eScholarship repository https://escholarship.org/uc/item/1dx015xc#main

Plutchik, R. (1980). *Emotion: A psycho-evolutionary synthesis*. Harper & Row.

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *Journal of Applied Psychology*, *88*(5), 879–903. https://doi.org/10.1037/0021-9010.88.5.879

Posner, J., Russell, J. A., & Peterson, B. S. (2005). The circumplex model of affect: An integrative approach to affective neuroscience, cognitive development, and psychopathology. *Development and Psychopathology*, *17*(3), 715–734. http://doi.org/10.1017/S0954579405050340

Potter, R. F., & Bolls, P. D. (2012). *Psychophysiological measurement and meaning. Cognitive and emotional processing of media*. Routledge.

Potter, R. F., Sites, J., Jamison-Koenig, E., & Zheng, X. (2018). The impact of cognitive load on the cardiac orienting response to auditory structural features during natural radio listening situations. *Journal of Cognition*, *1*(1), Article 39. https://doi.org/10.5334/joc.43

Raney, A. A. (2004). Expanding disposition theory: Reconsidering character liking, moral evaluations, and enjoyment. *Communication Theory*, *14*(4), 348–369. https://doi.org/10.1111/j.1468-2885.2004.tb00319.x

Raney, A. A. (2006). The psychology of disposition-based theories of media enjoyment. In J. Bryant & P. Vorderer (Eds.), *Psychology of entertainment* (pp. 137–150). Lawrence Erlbaum.

Raney, A. A. (2011). The role of morality in emotional reactions to and enjoyment of media entertainment. *Journal of Media Psychology*, *23*(1), 18–23. https://doi.org/10.1027/1864-1105/a000027

Ratcliff, C. L., & Sun, Y. (2020). Overcoming resistance through narratives: Findings from a meta-analytic review. *Human Communication Research*, *46*(4), 412–443. https://doi.org/10.1093/hcr/hqz017

Ravaja, N. (2004). Contributions of psychophysiology to media research: Review and recommendations. *Media Psychology*, *6*(2), 193–235. https://doi.org/10.1207/s1532785xmep0602_4

Reagan, A. J., Mitchell, L., Kiley, D., Danforth, C. M., & Dodds, P. S. (2016). The emotional arcs of stories are dominated by six basic shapes. *EPJ Data Science*, *5*(1), Article 31. https://doi.org/10.1140/epjds/s13688-016-0093-1

Reis, E. S., Arriaga, P. P. L., & Postolache, O. A. (2019). Fear or humour in anti-smoking campaigns? Impact on perceived effectiveness and support for tobacco control policies. *Ciência & Saúde Coletiva*, *24*(12), 4727–4738. https://doi.org/10.1590/1413-812320182412.09322018

Reisenzein, R., Studtmann, M., & Horstmann, G. (2013). Coherence between emotion and facial expression: Evidence from laboratory experiments. *Emotion Review*, *5*(1), 16–23. https://doi.org/10.1177/1754073912457228

Rimé, B. (2009). Emotion elicits the social sharing of emotion: Theory and empirical review. *Emotion Review*, *1*(1), 60–85. https://doi.org/10.1177/1754073908097189

Robinson, M. D., & Clore, G. L. (2002). Belief and feeling: Evidence for an accessibility model of emotional self-report. *Psychological Bulletin*, *128*(6), 934–960. https://doi.org/10.1037/0033-2909.128.6.934

Rodero, E. (2012). See it on a radio story: Sound effects and shots to evoked imagery and attention on audio fiction. *Communication Research*, *39*(4), 458–479. https://doi.org/10.1177/0093650210386947

Rodero, E., & Romero, L. (2022). Let me listen to where you are. Spatial dimension resources in audio stories can increase imagery, transportation, attention, and recall. *Media Psychology*, *25*(1), 155–179. https://doi.org/10.1080/15213269.2021.1880439

Rossiter, J. R., Percy, L., & Donovan, R. J. (1991). A better advertising planning grid. *Journal of Advertising Research*, *31*(5), 11–21.

Rossiter, J. R., & Thornton, J. (2004). Fear-pattern analysis supports the fear-drive model for antispeeding road-safety TV ads. *Psychology & Marketing*, *21*(11), 945–960. https://doi.org/10.1002/mar.20042

Royzman, E. B., & Rozin, P. (2006). Limits of symhedonia: The differential role of prior emotional attachment in sympathy and sympathetic joy. *Emotion*, *6*(1), 82–93. https://doi.org/10.1037/1528-3542.6.1.82

Ruef, A. M., & Levenson, R. W. (2007). Continuous measurement of emotion: The affect rating dial. In J. A. Coan & J. J. B. Allen (Eds.), *Handbook of emotion elicitation and assessment* (pp. 286–297). Oxford University Press.

Russell, J. A., & Barrett, L. F. (1999). Core affect prototypical emotion episodes and other things called emotion. Dissecting the elephant. *Journal of Personality and Social Psychology*, *76*(5), 805–819. https://doi.org/10.1037/0022-3514.76.5.805

Sabido, M. (2004). The origins of entertainment-education. In Arvind Singhal, M. J. Cody, E. M. Rogers, & M. Sabido (Eds.), *Entertainment-education and social change : History, research, and practice* (pp. 61–74). Lawrence Erlbaum.

Sangalang, A., Ophir, Y., & Cappella, J. N. (2019). The potential for narrative correctives to combat misinformation. *Journal of Communication*, *69*(3), 298–319. https://doi.org/10.1093/joc/jqz014

Scherer, K. R. (1984). Emotion as a multicomponent process: A model and some cross-cultural data. *Review of Personality & Social Psychology*, *5*, 37–63.

Scherer, K. R. (2001). Appraisal considered as a process of multilevel sequential checking. In K. R. Scherer, A. Schorr, & T. Johnstone (Eds.), *Appraisal processes in emotion: Theory, methods, research* (pp. 92–120). Oxford University Press.

Scherer, K. R. (2009). The dynamic architecture of emotion: evidence for the component process model. *Cognition and Emotion*, *23*(7), 1307–1351. https://doi.org/10.1080/02699930902928969

Schmälzle, R., & Grall, C. (2020). Psychophysiological methods: Options, uses, and validity.

In J. Van den Bulck, D. R. Ewoldsen, M.-L. Mares, & E. Scharrer (Eds.), *The international encyclopedia of media psychology*. https://doi.org/10.1002/9781119011071.iemp0013

Schramm, H., & Wirth, W. (2010). Exploring the paradox of sad-film enjoyment: The role of multiple appraisals and meta-appraisals. *Poetics*, *38*(3), 319–335. https://doi.org/10.1016/j.poetic.2010.03.002

Schreiner, C., Appel, M., Isberner, M.-B., & Richter, T. (2018). Argument strength and the persuasiveness of stories. *Discourse Processes*, *55*(4), 371–386. https://doi.org/10.1080/0163853X.2016.1257406

Segal, E. M. (1995). Narrative comprehension and the role of deictic shift theory. In J. F. Duchan, G. A. Bruder, & L. E. Hewitt (Eds.), *Deixis in narrative: A cognitive science perspective* (pp. 3–17). Psychology Press. https://doi.org/10.4324/9780203052907

Seilman, U., & Larsen, S. F. (1989). Personal resonance to literature: A study of remindings while reading. *Poetics, 18*(1–2), 165–177. https://doi.org/10.1016/0304-422X(89)90027-2

Shafer, D. M., & Raney, A. A. (2012). Exploring how we enjoy antihero narratives. *Journal of Communication*, *62*(6), 1028–1046. https://doi.org/10.1111/j.1460-2466.2012.01682.x

Shedlosky-Shoemaker, R., Costabile, K. A., Deluca, H. K., & Arkin, R. M. (2011). The social experience of entertainment media. *Journal of Media Psychology*, *23*(3), 111–121. https://doi.org/10.1027/1864-1105/a000042

Shen, F., Sheer, V. C., & Li, R. (2015). Impact of narratives on persuasion in health communication: A meta-analysis. *Journal of Advertising*, *44*(2), 105–113. https://doi.org/10.1080/00913367.2015.1018467

Shen, L., & Li, S. S.. (2023). Quantifying emotional flow: Testing the emotional flow hypothesis from a longitudinal latent growth curve (LGC) modeling approach. *Media Psychology, 26*(4), 436–459. https://doi.org/10.1080/15213269.2022.2156886

Siegenthaler, P., Ort, A., & Fahr, A. (2021). The influence of valence shifts in fear appeals on message processing and behavioral intentions: A moderated mediation model. *PLoS ONE*, *16*(9), Article e0255113. https://doi.org/10.1371/journal.pone.0255113

Skitka, L. J., Bauman, C. W., & Sargis, E. G. (2005). Moral conviction: Another contributor to attitude strength or something more? *Journal of Personality and Social Psychology*, *88*(6), 895–917. https://doi.org/10.1037/0022-3514.88.6.895

Slater, M. D., & Rouner, D. (2002). Entertainment-education and elaboration likelihood: Understanding the processing of narrative persuasion. *Communication Theory*, *12*(2), 173–191. https://doi.org/10.1111/j.1468-2885.2002.tb00265.x

Southwell, B. G., & Yzer, M. C. (2007). The roles of interpersonal communication in mass media campaigns. *Annals of the International Communication Association*, *31*(1), 420–462. https://doi.org/10.1080/23808985.2007.11679072

Stieglitz, S., & Dang-Xuan, L. (2013). Emotions and information diffusion in social media - sentiment of microblogs and sharing behavior. *Journal of Management Information Systems*, *29*(4), 217–248. https://doi.org/10.2753/MIS0742-1222290408

Stöckli, S., Schulte-Mecklenbeck, M., Borer, S., & Samson, A. C. (2018). Facial expression analysis with AFFDEX and FACET: A validation study. *Behavior Research Methods*,

50(4), 1446–1460. https://doi.org/10.3758/s13428-017-0996-1

Sukalla, F., Bilandzic, H., Bolls, P. D., & Busselle, R. W. (2016). Embodiment of narrative engagement. Connecting self-reported narrative engagement to psychophysiological measures. *Journal of Media Psychology*, *28*(4), 175–186. https://doi.org/10.1027/1864-1105/a000153

Sukalla, F., Shoenberger, H., & Bolls, P. D. (2016). Surprise! An investigation of orienting responses to test assumptions of narrative processing. *Communication Research*, *43*(6), 844–862. https://doi.org/10.1177/0093650215596363

Tal-Or, N., & Cohen, J. (2010). Understanding audience involvement: Conceptualizing and manipulating identification and transportation. *Poetics*, *38*(4), 402–418. https://doi.org/10.1016/j.poetic.2010.05.004

Tan, E. S.-H. (1995). Film-induced affect as a witness emotion. *Poetics*, *23*(1–2), 7–32. https://doi.org/10.1016/0304-422X(94)00024-Z

Tan, E. S.-H. (1996). *Emotion and the structure of narrative film: Film as an emotion machine*. Routledge.

Tan, E. S.-H. (2008). Entertainment is emotion: The functional architecture of the entertainment experience. *Media Psychology*, *11*(1), 28–51. https://doi.org/10.1080/15213260701853161

Tannenbaum, M. B., Hepler, J., Zimmerman, R. S., Saul, L., Jacobs, S., Wilson, K., & Albarracín, D. (2015). Appealing to fear: A meta-analysis of fear appeal effectiveness and theories. *Psychological Bulletin*, *141*(6), 1178–1204. https://doi.org/10.1037/a0039729

Tassinary, L. G., & Cacioppo, J. T. (2007). The skeletomotor system. Surface electromyography. In J. T. Cacioppo, L. G. Tassinary, & G. G. Berntson (Eds.), *Handbook of psychophysiology* (3rd ed., pp. 163–199). Cambridge University Press.

Tchernev, J. M. (2022). Creating character identification and liking in narratives: The impact of protagonist motivations on real-time audience responses. *Media Psychology*, *25*(5), 740–761. https://doi.org/10.1080/15213269.2022.2067878

Tchernev, J. M., Collier, J., & Wang, Z. (2023). There and back again? Exploring the real-time cognitive journey of narrative transportation. *Communication Research*, *50*(3), 312–337. https://doi.org/10.1177/00936502211018577

Teixeira, T., Wedel, M., & Pieters, R. (2012). Emotion-induced engagement in internet video advertisements. *Journal of Marketing Research*, *49*(2), 144–159. https://doi.org/10.1509/jmr.10.0207

Thompson, J. M., Teasdale, B., Duncan, S., van Emde Boas, E., Budelmann, F., Maguire, L., & Dunbar, R. I. M. (2018). Individual differences in transportation into narrative drama. *Review of General Psychology*, *22*(2), 210–219. https://doi.org/10.1037/gpr0000130

Tiede, K. E., & Appel, M. (2020). Reviews, expectations, and the experience of stories. *Media Psychology*, *23*(3), 365–390. https://doi.org/10.1080/15213269.2019.1602055

Tukachinsky, R. (2014). Experimental manipulation of psychological involvement with media. *Communication Methods and Measures*, *8*(1), 1–33. https://doi.org/10.1080/19312458.2013.873777

Tukachinsky, R., & Tokunaga, R. S. (2013). The effects of engagement with entertainment.

Annals of the International Communication Association, *37*(1), 287–322. https://doi.org/10.1080/23808985.2013.11679153

Valkenburg, P. M. (2017). Understanding self-effects in social media. *Human Communication Research*, *43*(4), 477–490. https://doi.org/10.1111/hcre.12113

van den Putte, B., Yzer, M., Southwell, B. G., de Bruijn, G.-J., & Willemsen, M. C. (2011). Interpersonal communication as an indirect pathway for the effect of antismoking media content on smoking cessation. *Journal of Health Communication*, *16*(5), 470–485. https://doi.org/10.1080/10810730.2010.546487

van Laer, T., de Ruyter, K., Visconti, L. M., & Wetzels, M. (2014). The extended transportation-imagery model: A meta-analysis of the antecedents and consequences of consumers' narrative transportation. *Journal of Consumer Research*, *40*(5), 797–817. https://doi.org/10.1086/673383

Vezzali, L., Stathi, S., Giovannini, D., Capozza, D., & Trifiletti, E. (2015). The greatest magic of Harry Potter: Reducing prejudice. *Journal of Applied Social Psychology*, *45*, 105–121. https://doi.org/10.1111/jasp.12279

Visch, V., & Tan, E. (2008). Narrative versus style: Effect of genre-typical events versus genre-typical filmic realizations on film viewers' genre recognition. *Poetics*, *36*(4), 301–315. https://doi.org/10.1016/j.poetic.2008.03.003

Vitouch, O. (2001). When your ear sets the stage: Musical context effects in film perception. *Psychology of Music*, *29*(1), 70–83. https://doi.org/10.1177/0305735601291005

Vonnegut, K. (1981). *Palm sunday. An autobiographical collage*. Random House.

Wagner, V., Scharinger, M., Knoop, C. A., & Menninghaus, W. (2021). Effects of continuous self-reporting on aesthetic evaluation and emotional responses. *Poetics*, *85*, Article 101497. https://doi.org/10.1016/j.poetic.2020.101497

Walentynowicz, M., Schneider, S., & Stone, A. A. (2018). The effects of time frames on self-report. *PLoS ONE*, *13*(8), Article e0201655. https://doi.org/10.1371/journal.pone.0201655

Walter, N., Bilandzic, H., Schwarz, N., & Brooks, J. J. (2021). Metacognitive approach to narrative persuasion: The desirable and undesirable consequences of narrative disfluency. *Media Psychology*, *24*(5), 713–739. https://doi.org/10.1080/15213269.2020.1789477

Walter, N., Cody, M. J., Xu, L. Z., & Murphy, S. T. (2018). A priest, a rabbi, and a minister walk into a bar: A meta-analysis of humor effects on persuasion. *Human Communication Research*, *44*(4), 343–373. https://doi.org/10.1093/hcr/hqy005

Wang, J., & Calder, B. J. (2006). Media transportation and advertising. *Journal of Consumer Research*, *33*(2), 151–162. https://doi.org/10.1086/506296

Wang, J., & Calder, B. J. (2009). Media engagement and advertising: Transportation, matching, transference and intrusion. *Journal of Consumer Psychology*, *19*(3), 546–555. https://doi.org/10.1016/j.jcps.2009.05.005

Weth, K., Raab, M. H., & Carbon, C. C. (2015). Investigating emotional responses to self-selected sad music via self-report and automated facial analysis. *Musicae Scientiae*, *19*(4), 412–432. https://doi.org/10.1177/1029864915606796

Wirth, W., & Schramm, H. (2005). Media and Emotions. *Communication Research Trends*,

3–39. https://doi.org/10.5167/uzh-101679

Wirth, W., Hofer, M., & Schramm, H. (2012). Beyond pleasure: Exploring the eudaimonic entertainment experience. *Human Communication Research*, *38*(4), 406–428. https://doi.org/10.1111/j.1468-2958.2012.01434.x

Wirth, W., & Schramm, H. (2007). *Emotionen, Metaemotionen und Regulationsstrategien bei der Medienrezeption. Ein integratives Modell*. In W. Wirth, H.-J. Stiehler, & C. Wünsch (Eds.), *Dynamisch–transaktional denken. Theorie und Empirie der Kommunikationswissenschaft* (pp. 153–184). Herbert von Halem.

Yu, C.-Y., & Ko, C.-H. (2017). Applying FaceReader to recognize consumer emotions in graphic styles. *Procedia CIRP*, *60*, 104–109. https://doi.org/10.1016/j.procir.2017.01.014

Zebregs, S., van den Putte, B., Neijens, P., & de Graaf, A. (2015). The differential impact of statistical and narrative evidence on beliefs, attitude, and intention: A meta-analysis. *Health Communication*, *30*(3), 282–289. https://doi.org/10.1080/10410236.2013.842528

Zillmann, D. (1983). Transfer of excitation in emotional behavior. In J. T. Cacioppo & R. E. Petty (Eds.), *Social psychology: A sourcebook* (pp. 215–240). Guilford.

Zillmann, D. (1988). Mood management through communication choices. *American Behavioral Scientist*, *31*(3), 327–340. https://doi.org/10.1177/000276488031003005

Zillmann, D. (1996). The psychology of suspense in dramatic exposition. In P. Vorderer, H. J. Wulff, & M. Friedrichsen (Eds.), *Suspense: Conceptualizations, theoretical analyses, and empirical explorations* (pp. 199–231). Lawrence Erlbaum.

Zillmann, D. (2006). Dramaturgy for emotions from fictional narration. In J. Bryant & P. Vorderer (Eds.), *Psychology of entertainment* (pp. 215–238). Lawrence Erlbaum.

Zillmann, D., & Cantor, J. R. (1977). Affective responses to the emotions of a protagonist. *Journal of Experimental Social Psychology*, *13*(2), 155–165. https://doi.org/10.1016/S0022-1031(77)80008-5