

Transportation Into Narrative Worlds and the Motivation to Change Health-Related Behavior

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Stories are considered to be a potent means to change health-related attitudes, beliefs, and behavior because of recipients' transportation into the narrative world. Little emphasis, however, has been given to the link between transportation and process variables that are pertinent to health behavior. Connecting narrative persuasion to the health action process approach, a model comprising transportation, risk severity, self-efficacy, and outcome expectancies, was specified to predict behavioral intentions. In an experiment, a short narrative video clip on drinking and driving was presented under conditions of low versus high transportation. A structural equation model showed that transportation directly influenced risk severity, which in turn influenced outcome expectancies and self-efficacy. Whereas outcome expectancies and self-efficacy were positively related to behavioral intentions, the link between risk severity and intentions was negative when the other variables were included in the model. Implications and future research on narrative health communication are discussed.

Keywords: health narratives, health action process approach, transportation, drunk driving, narrative persuasion

Much of information that individuals encounter on a daily basis is presented in the form of a story. Stories or narratives (both terms will be used synonymously throughout this article) have been defined as "the representation of an event or a series of events" (Abbott, 2002, p. 12), and they often entail a schematic plotline consisting of one or more protagonists, a conflict or significant life event, and a resolution. Stories attract attention, they elicit thoughts and emotions, and they appear to fit the cognitive

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architecture of humans particularly well (cf. Gottschall, 2012). Thus, stories could be an effective way to achieve goals in the field of health communication.

A substantial part of the available research on the effects of narratives on attitudes, beliefs, and behavior includes dependent variables that deal with health issues (e.g., cancer screening, organ donation, tobacco use; see de Graaf, Sanders, & Hoeken, 2016, for an overview). To date, however, a systematic connection between theory and research on story processing on the one hand and theory and research on health behavior change on the other hand is rare. Variables such as self-efficacy or threat severity—key components of theories on health behavior change—have hardly been addressed.

The present work connects research on narrative persuasion with the motivational phase of the health action process approach (HAPA; Schwarzer, 2001, 2008). An experiment is presented that focused on the effects of being transported into the story world of a short narrative video about the potentially fatal consequences of drunk driving. A special emphasis is given to risk severity, outcome expectancies, and self-efficacy, which were specified to translate the influence of being transported into the narrative world on behavioral intentions to drink no alcohol when planning to drive. We start with a brief introduction on health behaviors, social cognitive models, and the HAPA (Schwarzer, 2001), the model on which our research is based. We subsequently introduce current research on narrative influence, with an emphasis on transportation theory.

Understanding Health Behaviors

In contemporary high-income countries, notably in North America and Western Europe, it has become somewhat of cultural truism that behavior plays a critical role in the health outcomes of individuals, social groups, and society as a whole. Increasingly, this is also the case in countries with developing economies, reflecting what has become known as *epidemiological transition* (Santosa, Wall, Fottrell, Högberg, & Byass, 2014). As living and working conditions of the population improve through socioeconomic progress, leading causes of death evolve from acute, communicable diseases, such as pneumonia, influenza, and tuberculosis, to lifestyle-related conditions, such as cardiovascular disease and cancer (cf. Benziger, Roth, & Moran, 2016). A limited set of health-impairing behaviors is thought to account for much of the contemporary morbidity and mortality from chronic conditions, in particular, smoking, poor diet and physical inactivity, and alcohol consumption (Mokdad, Marks, Stroup, & Gerberding, 2004). It comes as no surprise that these behaviors have become a focus of health promotion efforts to improve population health.

Health communication is a critical component of the health promotion activities to increase awareness of a health threat, educate people about ways to mitigate risks, and promote the uptake of a recommended course of action. Health communication may be concerned with the diversity of behaviors related to health, including, possibly most prominently, diminishing health-impairing behaviors (e.g., smoking), as well as encouraging health-promoting (e.g., regular physical exercise), health-detection (e.g., regular Pap smear), and health-maintaining (e.g., adherence to a medication regimen) behaviors, to prevent ill health (primary prevention), ensure timely detection (secondary prevention), and safeguard well-being (tertiary prevention), with a range of audiences. Health communication executions typically

also differ widely with respect to characteristics of the source, message, and channel, and the present study was in particular concerned with the impact of message characteristics and related processing on health-related behavior. People's beliefs about themselves and the world around them are thought to exert proximal influence on their behaviors, mediating other psychological, interpersonal, cultural, and systemic influences; beliefs are also considered relatively open to change and an ideal target for health communication messages to behavior change (also see Conner & Norman, 2015). As health promotion activities generally have more impact if they address the factors that are known to shape the targeted behavior (cf. Bartholomew Eldredge et al., 2016), health communication needs to address those beliefs that are associated with the behavior, and do so in effective ways. Whereas health communication theory and research are mostly concerned with the conditions and processes whereby influence and change are obtained, understanding factors that shape behavior is mostly guided by behavioral theory and research in social and health psychology, in particular with respect to so-called *social cognition models*.

Social Cognition Models of Behavior

Social cognition models are a prominent class of behavioral theories developed in social psychology and health psychology, branches of psychology particularly concerned with understanding the proximal determinants of decision making regarding health and social behaviors (for a detailed discussion, see Conner & Norman, 2015). These types of theories emphasize the importance of social cognitions in behavioral decision making, that is, the various beliefs people hold that guide their thinking, evaluations, and decisions, and that are shaped through social interactions and experiences with the world. Social cognition models have a common foundation in classic notions of decision making that highlight the importance of people's expectancies about outcomes of a particular course of action and the value they attach to those outcomes, whereby choices are thought to reflect maximum subjective utility, that is, the course of action that results in maximum benefit and minimum cost.

Specific social cognition models differ in the specific types of beliefs they highlight, as well as in the processes through which they assume beliefs guide behavior. These models also differ as to whether they were developed to explain health behaviors in particular or social behaviors more generally, and whether they see behavior change as reflecting a gradually increasing likelihood (i.e., continuum models) or a series of qualitative distinct steps that people go through in a set order (i.e., stage models). The HAPA, which guides the current study, is an integrative, hybrid social cognition model that combines insights regarding the types of beliefs that shape a person's behavioral intention in the motivational phase with a consideration of processes that occur in the postintentional planning and action phases.

The Health Action Process Approach

The HAPA is meant to describe and explain health behavior and health behavior change (Schwarzer, 1992, 2001, 2008). As the HAPA model combines predictors and components of other models, it can, in part, draw on empirically well-founded associations (Schwarzer, 2001). Our emphasis in the current article is on the first, the motivational phase of the HAPA model (see Figure 1). According to the model, three variables—risk perception, outcome expectancies, and self-efficacy—influence behavioral intentions.

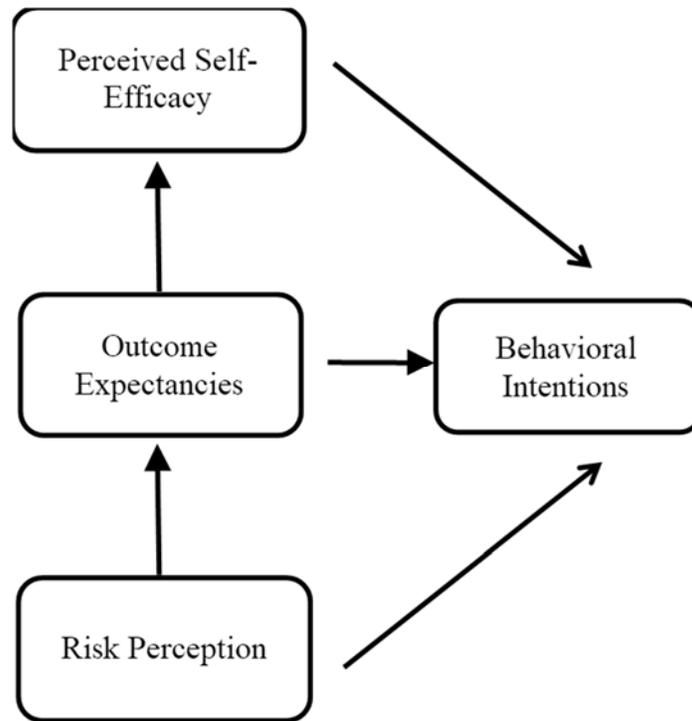


Figure 1. Early stages of the health action process approach: the three predictors of behavioral change and behavioral intentions as the first stage of change.

Risk perception is a basic component of many models of health behavior (e.g., the health belief model; Rosenstock, 1966). The conceptual idea is that to develop a motivation to change, individuals first need to become aware of the risks associated with a behavior. This includes perceptions of subjective vulnerability as well as acknowledging the severity of a health threat (see also Ajzen, 1991). Perceived severity is the assessment of the seriousness of negative health consequences of a given behavior, and thus the appraisal of how severe the consequences of the respective target behavior are. In the HAPA model, risk perception is a basic motivational force that is associated with increased behavioral intentions and more favorable outcome expectancies.

Outcome expectancies are the expectations regarding the consequences of a behavior and correspond to a weighing of the costs and benefits of the behavior. These (partly unconscious) considerations influence a person's decision for or against engaging in a particular health behavior, such as not drinking alcohol when one is going to drive. For the outcome expectancy, it is necessary that several alternative behaviors are available and also recognized. This construct is part of many theoretical models of health behavior, sometimes under different labels, that are part of classic economic theorizing of rational decision making. The balance of positive and negative outcome expectancies influences behavioral intentions and self-efficacy.

Self-efficacy is well known for its key role in social cognitive theory (Bandura, 1977). Bandura (1997) describes it as a belief "in one's capabilities to organize and execute courses of action required to produce given attainments" (p. 3). It corresponds to one's own competence expectation, but cannot be equated with optimism, as the individual trusts in his/her own competences and not in external resources. In the HAPA model, self-efficacy is the third variable that influences behavioral intentions.

Narrative Persuasion and Transportation

Theory and research on story processing and narrative effects suggest that the processes underlying the influence of stories differ from those delineated for nonnarrative texts or simple lists of arguments, and therefore from the mechanisms outlined in the classic dual-process models of persuasion (e.g., Petty & Cacioppo, 1986). The influence of stories has often been attributed to recipients' deep immersion into the story world. Following Gerrig (1993), this experience has been termed *transportation*, an "integrative melding of attention, imagery, and feelings, focused on story events" (Green & Donahue, 2009, p. 241). An alternative concept, *narrative engagement* (Busselle & Bilandzic, 2009), has a substantial overlap with transportation and has attracted considerable amount of research as well. Transportation is widely considered to be a psychological state that depends on several factors, most important the text or media product encountered (e.g., Gerrig, 1993; Green & Brock, 2002). Other factors include the situational context (e.g., watching a movie alone or in company; Tal-Or, 2016) and information about the story, such as reviews encountered prior to the exposure (Dixon, Bortolussi, & Sopčák, 2015; Shedlosky-Shoemaker, Costabile, DeLuca, & Arkin, 2011). Moreover, individuals vary in their propensity to get transported into a story world, with, for example, individuals high in need for affect (Maio & Esses, 2001) being more strongly transported than individuals low in need for affect (Appel & Richter, 2010). *Transportability* is another related trait (e.g., Dal Cin, Zanna, & Fong, 2004; Mazzocco, Green, Sasota, & Jones, 2010), which refers to individual differences in the tendency to become transported into a narrative world. Whereas transportation is a state, transportability seeks to capture the trait component of being immersed into story worlds (see Gnambs, Appel, Schreiner, Richter, & Isberner, 2014, for a latent state-trait analysis of transportation).

Research on the impact of stories has attracted the attention of researchers from a variety of fields. Story influence has been examined regarding consumer brands and goods (e.g., Escalas, 2007; Kim, Ratneshwar, & Thorson, 2017), attitudes toward out-group members (e.g., Green, 2004; D. R. Johnson, 2013), and climate change attitudes and related behavior (e.g., Appel & Mara, 2013; Jones, 2014). Health outcomes have received particularly strong attention, including topics such as organ donation (e.g., Appel & Richter, 2010; E. L. Cohen, 2010; Feeley, Marshall, & Reinhart, 2006), sun protection (Dunlop, Wakefield, & Kashima, 2010), or human papilloma virus prevention (HPV; e.g., Murphy, Frank, Chatterjee, & Baezconde-Garbanati, 2013; Nan, Dahlstrom, Richards, & Rangarajan, 2015). Research on binge drinking has shown positive effects of a story on alcohol drinking behavior, intentions to decrease alcohol use, and perceived normative pressure, with stronger effects among less-educated viewers (Van Leeuwen, Renes, & Leeuwis, 2013; Van Leeuwen, Van Den Putte, Renes, & Leeuwis, 2017).

We identified only one published study in the narrative persuasion tradition in which the risks of drinking and driving had been the focus (Moyer-Gusé, Jain, & Chung, 2012). In that study, the effects of an explicit persuasive appeal at the end of a crime drama (an episode of *Law & Order: SVU*) were investigated, with counterarguing and attitudes as the main dependent variables. The results indicated that, at least for men, including an explicit appeal that explicitly asked viewers to avoid drinking and driving led to less favorable attitudes toward drunk driving.

Although transportation was not of focal interest in the Moyer-Gusé et al. (2012) study, a substantial amount of research has yielded evidence for a positive association between self-reported transportation and indicators of persuasive effects such as attitudes (e.g., Mazzocco et al., 2010; Wang & Calder, 2006), beliefs (e.g., Appel & Richter, 2007; Bilandzic & Busselle, 2008), and behavioral intentions (e.g., Banerjee & Greene, 2013; Moyer-Gusé & Nabi, 2010). Several mechanisms have been proposed as to how transportation facilitates narrative persuasion. First, transportation is expected to reduce counterarguing and other cognitive activities that signal a resistance to persuasive attempts (cf. Green & Brock, 2000). Second, a key component of transportation is the experience of vivid mental representations of the events described, which—at least in the long run—could lead to a melding of these events with actual real-world experiences (cf. M. K. Johnson, Hashtroudi, & Lindsay, 1993). Third, transportation implies strong emotional experiences. These can facilitate narrative persuasion via positive mood induction, arousal, or positive links to the story characters and their actions and perceptions (Appel & Richter, 2010; cf. Jonathan Cohen, 2001; Nabi & Green, 2015).

To date, however, little is known about the link between transportation and actual behavior; the link between transportation and variables other than attitudes, beliefs, and intentions, such as self-efficacy (van Laer, de Ruyter, Visconti, & Wetzels, 2014); and the relationship between these supposed mechanisms. More generally, the current state of research is characterized by a lack of integration of research on stories and story processing on the one hand and models of behavior change, such as the HAPA model, on the other.

Narrative Influence on Risk Perceptions, Outcome Expectancies, and Self-Efficacy

Among the few studies on risk perceptions in the field of narrative health communication, the influence of narrative health messages on perceptions of the personal risk of getting infected with the hepatitis B virus and intentions to obtain hepatitis B vaccination was examined (De Wit, Das, & Vet, 2008). Participants received one of four messages, consisting of a personal account (narrative evidence), prevalence data (statistical evidence), a mere assertion of increased risk, or no risk information. Narrative evidence was expected to entail a strong vividness (cf. Taylor & Thompson, 1982), which should in turn increase the likelihood that the information would come to mind more easily and faster when judging personal risk and planning behavior (Tversky & Kahneman, 1973). Moreover, narrative transportation and the reduced counterarguing associated with this state should increase message-consistent risk perceptions and behavior. In line with the authors' predictions, the narrative message yielded higher risk perception scores (e.g., "The likelihood of me becoming infected with hepatitis B virus because of my sexual behavior is substantial"), whereas perceived severity was unaffected (e.g., "In your view, how severe is an infection with hepatitis B?").

Health-risk message type further had a marginally significant effect on intentions, which was mediated by message-induced differences in risk perception. In a recent study, however, no difference in risk perception was found between experimental groups exposed to statistical versus narrative evidence in the field of HPV vaccination (Nan et al., 2015). Hybrid messages that contained both narrative and statistical components yielded the highest perceptions of risk associated with HPV. Although De Wit and colleagues (2008) and Nan and colleagues (2015) had transportation theory as a key theoretical underpinning, they did not measure transportation.

The impact of stories on risk perceptions has been further highlighted in the risk convergence model (So & Nabi, 2013). The model posits that the psychological closeness to a mediated character who experiences a risk event drives the media's influence on personal risk perceptions. This psychological closeness (or reduction of perceived social distance) is represented in the experience of transportation, as well as the related concepts of personal relevance, identification, parasocial interaction, and perceived realism. In support of So and Nabi's (2013) framework, recipients' transportation into popular TV shows that involved issues related to sexually transmitted diseases (STDs) was positively associated with personal risk perceptions. Taken together, stories can have a substantial influence on risk perceptions (possibly in combination with statistical information; cf. Nan et al., 2015), and initial evidence suggests that transportation is positively associated with risk perceptions.

It has been further suggested that stories are a potent means to influence outcome expectancies (e.g., Moyer-Gusé, 2008) because they initiate learning from positive (or negative) models. When watching or reading a story, recipients follow a protagonist who is rewarded for his or her behavior, which may positively motivate and reinforce the behavior. Likewise, behavior that is punished is negatively reinforced (cf. Bandura, 2004). Transportation is supposed to increase the effects of these vicarious encounters (Green & Brock, 2000, 2002). Empirical studies on outcome expectancies in the field of narrative health communication are rare; Van Leeuwen and colleagues (2013) found no effect of a story (pre-post) on positive or negative outcome expectancies.

Based on a similar rationale, stories should be a potent means to increase self-efficacy. When a narrative message was compared with a no-message control condition, self-efficacy was enhanced (Falzon, Radel, Cantor, & d'Arripe-Longueville, 2015); however, in another study when compared with a nonnarrative (but informative) control condition, narrative messages (conversational and testimonial approaches) did not elicit higher self-efficacy (Slater, Buller, Waters, Archibeque, & LeBlanc, 2003). In partial support of the notion that transportation is a predictor of increased self-efficacy, identification with characters from the TV series *Sex and the City* who discussed STDs was found to be positively associated with self-efficacy, which was in turn positively related to behavioral intentions to discuss the topic of STDs themselves with their partner or other close persons. After a quantitative review of the transportation literature, van Laer and colleagues (2014) identified the link between transportation and self-efficacy as a major research avenue for researchers in the field.

Study Overview and Predictions

Our aim was to connect research into narrative influence and the concept of transportation with the HAPA model, a well-established framework in the field of health behavior and health behavior change. Our research was set in the field of drinking and driving. More specifically, our focus was on zero alcohol consumption, that is, on drinking no alcohol at all before driving, even if one or two drinks would be within the legal range. In Germany, the country where the study was conducted, thresholds are 0.03% (if drivers show some sign of impairment) and 0.05% (definite legal threshold) alcohol per volume of blood for experienced drivers over 21 years of age. We presented a short narrative clip on drinking and driving and manipulated the experiential state of transportation by means of reviews allotted prior to the movie. Research has shown that presenting positive versus negative reviews upfront is a feasible way to manipulate transportation (cf. Shedlosky-Shoemaker et al., 2011). We measured transportation as well as risk perception (notably risk severity), outcome expectancies, self-efficacy, and behavioral intentions. We assumed that the latter four variables would be interrelated as outlined in the HAPA model (Schwarzer, 2001). Importantly, we further assumed that being transported into the narrative world would be positively associated with risk severity, outcome expectancies, and self-efficacy, with these variables resulting in an indirect effect of transportation on behavioral intentions to drink no alcohol when expecting to drive.

Method

Participants and Procedure

Information about the study was sent by e-mail to all students of the University of Koblenz-Landau, Germany. Students who were eligible to receive partial course credit got credit for participation. Participation was voluntary and a link in the e-mail provided access to the study.

After a brief introduction to the study, participants were randomly assigned to one of two movie review conditions to manipulate transportation (see below). Next, participants were asked to reproduce the content of the review to ensure that they had actually read it. Subsequently, the experimental movie was shown, followed by the measures of process and outcome variables, as well as demographic variables and additional measures. Response times for answering the survey and watching the clip were assessed to identify any offhand responding. We excluded participants who failed to reproduce the gist of the review correctly, participants who indicated that they did not watch the entire movie, and participants with extreme response times (2–4% of the highest and lowest response times). In the end, the initial sample of 227 participants was reduced to an analytical sample of 190 participants (127 women). Their ages ranged from 18 to 64 years, with a mean age of 25.65 years ($SD = 9.28$).

Stimulus Movie and Experimental Treatment

The short movie clip *Letter of a Daughter* (German: *Brief einer Tochter*) by Ammar Sonderberg was presented. The clip is around 100-seconds long and adheres to a narrative form. The movie is about a young woman who retrospectively describes the events of one fatal night. The voice of the young woman

is heard off-screen, supposedly reading a letter to her mother. The movie starts with a party scene and the young woman is seen following her mother's advice to not drink any alcohol at the party because she planned to drive home. In an unfortunate turn of events, the young woman has an accident on her way home. A young man, who was driving his car after having drunk alcohol, caused the accident. It becomes clear that the young woman died from the impact of the drunk driver's car and that the letter she reads for her mother was written posthumously.

All participants watched the same movie clip. Our experimental manipulation took place before the movie was presented. One of two reviews of the clip to follow next was shown randomly. One review was positive (group size = 103), highlighting the quality of the short movie, and the other was negative (group size = 87). The reviews were meant to manipulate the state of transportation without interfering with basic comprehension processes (e.g., Shedlosky-Shoemaker et al., 2011).

Measures

Transportation. We used the Transportation Scale—Short Form (Appel, Gnambs, Richter, & Green, 2015) to measure participants' state of transportation. The default scale includes two items to assess imagery for two different main characters. The stimulus material (i.e., the short movie clip), however, is about one main protagonist only (the young woman). Thus, we followed the authors' advice to include one character-centered imagery item and to add the alternative second imagery item ("I had a vivid mental image of the story setting"). The Transportation Scale—Short Form contains six items overall, rated on a 7-point scale ranging from 1 (*not at all*) to 7 (*very much*); Cronbach's alpha of the items was .86.

Risk Severity. Three items asked about perceived severity of the risk portrayed, encompassing the health risk for oneself as well as the risk for other road users after drinking alcohol, even if the blood alcohol level would be within the legal range ("How much do you put your own health at risk when you drive after you have drunk alcohol, e.g., one beer instead of no beer at all?" "How much do you put the health of other traffic users at risk when you drive after you have drunk alcohol, e.g., one beer instead of no beer at all?" "How much do you put your own health at risk if you drive with somebody who has drunk alcohol, e.g., one beer instead of no beer at all?"). The items were rated on a 7-point scale ranging from 1 (*not at all*) to 7 (*very high/life-threatening*).¹ Internal consistency of the scale was excellent (Cronbach's $\alpha = .95$).

Outcome Expectancies. Our assessment of outcome expectancies focused on positive outcome expectancies and consisted of two items ("If I drive and do not drink alcohol at all, other people will perceive me as more responsible than when I have drunk alcohol, e.g., one beer";² "If I do not drink

¹ The item wordings and response options are based on work by Schwarzer and colleagues (2013). Although the wordings involve the notion of degree of risk (from low to high), it was intended to be a measure of severity by Schwarzer and colleagues, as well as by us.

² Although this item could possibly be interpreted as social norm at the conceptual level, it was meant to represent positive outcome expectancies.

alcohol at all before driving instead of, for example, one beer, I will feel safer while driving"; Cronbach's $\alpha = .56$).³ The items were scored on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*).

Perceived Self-Efficacy. Our measure of perceived self-efficacy consisted of three items that asked about perceived efficacy regarding not driving a car after consuming alcohol and self-efficacy regarding not drinking any alcohol at all if the person was going to drive a car later ("If I drive, it is easy for me—even at parties—not to drink alcohol at all"; "It is no problem for me not to drive with the car after having drunk alcohol, for example, only one beer"; "Even if I drink only one beer, I will recognize that I should not be driving home"). The items were scored on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Internal consistency was acceptable (Cronbach's $\alpha = .73$).

Behavioral Intentions. Two items asked about participants' intention not to drive after having drunk alcohol, even if the blood alcohol level would be within the legal range ("I intend not to drink any alcohol if I plan to drive later—not even, for example, one beer"; "I intend not to drive after having drunk a low amount of alcohol, for example, only one beer"). The items were scored on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). The internal consistency of the scale was good (Cronbach's $\alpha = .88$).

Additional Measures. At the end of the survey, we asked participants about whether they had a driver's license. In our sample, all but five participants did have a driver's license (all but one in the positive review condition; all but four in the negative review condition). Additional analyses showed that excluding the participants without a license did not change the results. Among the remaining 185 participants with a license, 31 (16.75%) indicated on a subsequent item that they did not drive regularly (i.e., at least once a month; all others drove more often). Among these participants, 13 had been allocated to the positive review condition and 18 to the negative review condition. The difference between conditions was not significant, $\chi^2(1, N = 185) = 2.62, p > .10$. As individuals with a driver's license who do not drive regularly could still face situations in which drinking and driving is an issue (e.g., being the only person at legal driving age among a group of friends; driving the parents' car during semester breaks), we included these participants in our analyses. The gender distribution was similar in both experimental groups, with 66.67% women in the positive review condition and 66.99% women in the negative review condition. Likewise, the average age did not differ between conditions: positive review, $M = 25.39$ years, $SD = 8.12$; negative review, $M = 25.86$ years, $SD = 10.23$; $t(187.32) = -0.36, p > .70$.

³ Participants additionally answered three items on negative outcome expectancies. This scale showed an unacceptable reliability (Cronbach's $\alpha = .13$); therefore, we excluded this scale from our analyses. Furthermore, we originally included one additional item meant to measure positive outcome expectancies. This item was excluded from the scale because of a very low item-scale correlation ($r_{it} = -.10$). Moreover, the perceived self-efficacy scale included one additional item, which was excluded from the scale because it showed poor fit ($r_{it} = .31$).

Results

Effect of the Transportation Manipulation

We expected participants who read a positive review to score higher on transportation than participants who read a negative review. Descriptive results were as expected, with $M_{\text{negative}} = 4.95$ ($SD = 1.37$) and $M_{\text{positive}} = 5.34$ ($SD = 1.10$). A two-tailed t test was performed, with degrees of freedom corrected because of a somewhat unequal number of participants (Welch, 1947). The mean scores of transportation were significantly different across the two conditions, $t(164.30) = -2.12$, $p < .035$, with a small effect size, as indicated by $d = .31$ (Jacob Cohen, 1988).⁴

Structural Equation Modeling of Narrative Effects

The hypothesized model was tested with structural equation modeling using AMOS (Arbuckle, 2010). Zero-order correlations of the continuous variables included in the model are presented in Table 1.

Table 1. Means, Standard Deviations, and Zero-Order Correlations Between the Continuous Variables.

Variable	<i>M</i> (<i>SD</i>)	1	2	3	4
1. Transportation	5.16 (1.24)				
2. Risk severity	4.21 (1.65)	.24***			
3. Positive outcome expectancies	5.24 (1.69)	.19**	.54***		
4. Perceived self-efficacy	4.88 (1.56)	.19**	.59***	.53***	
5. Behavioral intentions	4.84 (2.06)	.19**	.57***	.64***	.80***

Note. Manifest variable correlations. $N = 190$.

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

The structural equation model included risk severity, positive outcome expectancies, and perceived self-efficacy as latent variables, with the respective items as indicator variables. The endogenous variable behavioral intentions was added into the model as a manifest variable. This was due to potential model identification problems with only two indicator variables. The manifest variable was built by averaging both items. Model estimations were conducted using maximum likelihood estimation, which is robust to multivariate nonnormality. To evaluate overall goodness of fit, we considered several indices. Values of the chi-square to degree of freedom ratio (χ^2/df) less than 3.0, a comparative fit index

⁴ Consistent with gender effects on transportation reported in prior research (cf. van Laer et al., 2014), women showed higher scores on transportation— $M_f = 5.34$, $SD = 1.13$; $M_m = 4.80$, $SD = 1.37$; $t(104.98) = 2.73$, $p = .007$; $d = .45$ —as well as on risk severity— $M_f = 4.43$, $SD = 1.63$; $M_m = 3.78$, $SD = 1.61$; $t(124.58) = 2.61$, $p = .010$; $d = .40$ —and behavioral intentions— $M_f = 5.14$, $SD = 1.88$; $M_m = 4.23$, $SD = 2.28$; $t(105.18) = 2.74$, $p = .007$; $d = .45$. Marginally significant differences were found for outcome expectancies— $M_f = 5.41$, $SD = 1.60$; $M_m = 4.89$, $SD = 1.82$; $t(110.94) = 1.94$, $p = .055$; $d = .31$ —and for perceived self-efficacy— $M_f = 5.59$, $SD = 1.30$; $M_m = 5.20$, $SD = 1.41$; $t(115.25) = 1.86$, $p = .066$; $d = .29$.

(CFI) and norm fit index (NFI) greater than .90, and a root mean square error of approximation (RMSEA) of .08 or lower indicate adequate fit (cf. Bentler, 1990; Browne & Cudeck, 1992; Kline, 2005). The model included the (dummy-coded) review condition as an exogenous variable, which was assumed to influence transportation. We did not expect associations between the HAPA variables to differ between experimental conditions, a presumption that was supported by the data when the model was examined separately for both review conditions. The hypothesized model had an acceptable fit to the data, as indicated by $\chi^2(190) = 183.44$, $p < .001$; $\chi^2/df = 1.89$; CFI = .95; NFI = .90; RMSEA = .07, 90% CI [.05, .08]. The standardized parameter estimates are shown in Figure 2.

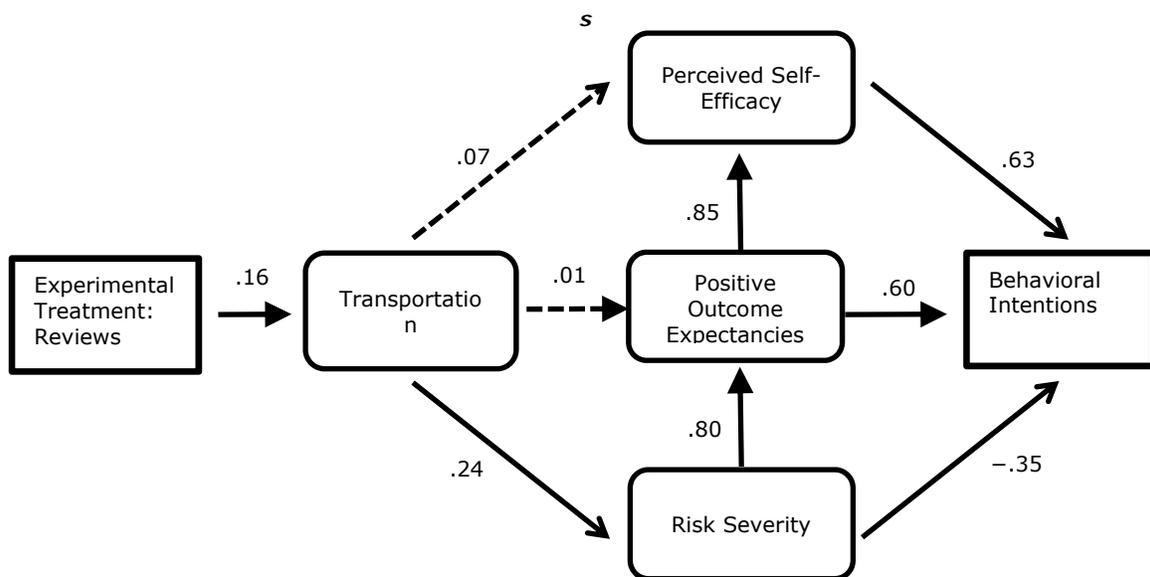


Figure 2. Results of the structural equation model.
Dotted lines indicate a nonsignificant path ($p > .05$).

Findings indicate that review condition had a significant effect on transportation. Transportation in turn was positively associated with perceived risk severity. The paths from transportation to positive outcome expectancies and perceived self-efficacy were not significant. Consistent with the HAPA model, positive associations between risk severity, positive outcome expectancies, and perceived self-efficacy were found. Behavioral intentions were associated with risk severity, outcome expectancies, and perceived self-efficacy. Whereas more positive outcome expectancies and higher perceived self-efficacy were associated with higher behavioral intentions not to drink and drive, the regression weight of risk severity on behavioral intentions was negative. In contrast to expectations derived from the HAPA model, in our complete model, risk severity was negatively associated with intentions (zero-order correlations showed a positive relationship).

Discussion

Research on the processing and the effects of stories in the context of health promotion is thriving, but a thorough connection between theory and research on narrative effects on the one hand and health psychology and health communication theory on the other hand is rare. Our aim in the present article was to address this research lacuna and to connect the motivational components of the HAPA (Schwarzer, 2001) to transportation theory and research (cf. Gerrig, 1993; Green & Brock, 2002). Our health topic was driving under the influence of alcohol, with a special emphasis on driving without drinking any alcohol.

We tested a theory-guided structural equation model including an experimental manipulation of transportation as an exogenous variable, behavioral intentions as the outcome variable, and latent factors for transportation, risk severity, outcome expectancies, and self-efficacy as process variables. Transportation was influenced by our experimental manipulation as predicted. Transportation scores, in turn, had a significantly positive influence on risk severity; however, in the structural equation model, no direct influence of transportation on outcome expectancies or self-efficacy was found. The limited influence of transportation on the latter variables is in line with some of the prior studies in the field (Slater et al., 2003; Van Leeuwen et al., 2013). However, we cannot rule out the notion that for stories that involve a more extensive modeling of behavior than the story we presented (such as more didactic stories in the entertainment–education tradition; cf. Singhal, Cody, Rogers, & Sabido, 2004) transportation could be more strongly related to outcome expectancies and self-efficacy. In particular, these relationships could hold even when risk severity is in a comprehensive model.

Risk severity was positively related to outcome expectancies, and outcome expectancies were positively related to self-efficacy. Whereas zero-order correlations of risk severity, outcome expectancies, and self-efficacy with behavioral intention were positive, in the structural equation model, only outcome expectancies and self-efficacy were positively related to intentions; the direction of the association was reversed for the association between risk severity and behavioral intentions. The lack of a positive association between risk perceptions and intentions has been observed in many studies. As noted by Parschau et al. (2014), “previous studies on the HAPA also failed to find risk perceptions associated with intention formation (e.g., Barg et al., 2012; Chiu, [Lynch, Chan, & Berven], 2011; Perrier, [Sweet, Strachan, & Latimer-Cheung, 2012] and therefore argued for the assumption that risk perception is a rather distal predictor of intention” (p. 45). It seems that risk perceptions can lead to further elaborations (represented in outcome expectancies and self-efficacy), but they are not sufficient to form an intention (Parschau et al., 2014). Our finding that risk severity is negatively associated with intentions—once expectancies and efficacy are included in a structural equation model—may further indicate the presence of defensive processes. On the one hand, (transportation-triggered) increases in risk perception contribute to higher positive outcome expectancies and higher self-efficacy; on the other hand, risk perception that is not associated with positive outcome expectancies can initiate defensive processes, leading to lower behavioral intentions. As defense mechanisms variables had not been included in our research design, testing this possible mechanism is a worthwhile goal for future research. Given that our findings are suggestive of two diverging processes that are initiated by increased risk severity, models that explicitly

account for multiple processes such as the extended parallel process model (Witte, 1994) could be a valuable starting point for subsequent studies.

As a major limitation, it needs to be noted that we focused on variables specified as part of the early stages of the health behavior change process, and assessed the influence of being more or less transported into a story only on these early stage variables. Behavioral intention was the variable most proximal to behavioral enactment. This is in line with an abundance of research in the field of narrative health communication (cf. de Graaf et al., 2016). The HAPA model, on which we based our research design, incorporates several subsequent stages of change. Following the development of an intention, individuals need to plan how to pursue their goals. This planning stage can, for example, involve implementation intentions, that is, rather situation-specific plans regarding the “when,” “where,” and “how” a desired action will take place (Gollwitzer, 1999). Recent evidence suggests that stories could assist the planning stage by facilitating implementation intentions, which might be particularly beneficial for less-motivated people (Oh & Larose, 2015).

In the HAPA model, behavior or action is represented by a self-regulation phase that consists of initiating a behavior, maintaining the behavior, and recovery (in case of instances of failure). For this phase, concrete plans from the earlier phase are pivotal. Moreover, initiation, maintenance, and recovery are a function of individuals’ self-efficacy. To date, little is known about the influence of efficacy information included in health narratives (de Graaf et al., 2016). Future research is encouraged to further examine self-efficacy as a dependent variable, including studies that point out how story impact can be increased in this regard. On a related note, we envisage more studies to connect recent theory and research on the influence of stories on the self to more classic narrative persuasion studies in the Green and Brock tradition. Studies suggest that stories cannot only change beliefs about the outside, but also beliefs about who we are (at least in the short run; e.g., Djikic, Oatley, Zoeterman, & Peterson, 2009; Gabriel & Young, 2011; Richter, Appel, & Calio, 2014), and stories can help maintain a balanced personal identity (Slater, Johnson, Cohen, Comello, & Ewoldsen, 2014). Moreover, few studies to date have provided data on the influence of narratives on actual health behavior (for an exception, see Lemal & Van den Bulck, 2010; Oh & Larose, 2015). Clearly, more research is needed, not only on initiating behavior, but on behavior maintenance and recovery as well. Stories could, for example, play a role in encouraging individuals to keep up with a health behavior despite a recent relapse or failure.

We believe that the topic of our study—drinking and driving—is of high relevance to health scholars. Like in a prior study on drinking and driving that focused on the impact of narratives (Moyer-Gusé et al., 2012), our findings are based on one persuasive stimulus only. Recent review articles have emphasized the importance of generalizability of research in communications and media psychology (Reeves, Yeykelis, & Cummings, 2016; Slater, Peter, & Valkenburg, 2015). We acknowledge that our results need to be replicated with other stimuli and with other health topics. The stimulus we presented focused on the negative consequences of drunk driving, whereas the positive consequences of driving with zero alcohol were somewhat more implicit. Thus, we wish to see more research on the links between transportation and the health-related variables of risk severity, outcome expectancies, self-efficacy, and behavioral intentions.

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