



The Effects of Message Elements and Individual Attributes on Transportation in Health Narratives

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Abstract

Objective:

Health communication practitioners are faced with growing concerns regarding the effectiveness of health narratives to encourage pro-health behaviors. Health narratives are seen as interventions to assist individuals with health issues; however, there is little agreement on how to create effective health narratives that contribute to the health of society. This study attempts to shed new light on how to create effective health narratives by examining how narrative (story) attributes and individual (personal) attributes contribute to the transportation process and overall persuasiveness of narrative health communications.

Methods:

A 2 x 2 x 4 experimental design was employed to collect self-report and psychophysiological data was collected.

Results:

Findings from the study revealed that together vividness and perspective are significant variables that influence transportation and ultimately the persuasiveness of a health narrative. Individuals who were exposed to the figural vividness and third-person health narratives experienced a higher degree of transportation than those participants who were exposed to the background vividness and first-person health narratives. Participants who were exposed to the figural vividness and third-person manipulations exhibited increased attention as well as arousal.

Conclusions:

Theoretically, this study advanced the Transportation-Imagery Model by identifying two potential moderators of transportation (vividness and perspective) and thereby provides the basis for an extended model of transportation. The results also show that health communicators can enhance the effectiveness of communication messages by employing manipulating vividness and narrative perspective.

Keywords

Health communication; Narratives; Transportation; Psychophysiology; Technology; Persuasion

Introduction

Interest in the field of health communications has advanced rapidly over the past three decades. Both practitioners and researchers are seeking effective means of promoting healthy behaviors, through interventions, while discouraging potentially hazardous ones. Traditionally, health communicators have relied on statistical evidence supported by rational arguments and facts to promote positive health behaviors. However, over the past ten years a number of studies have found that narrative forms of communication are both highly persuasive and effective means of communicating health information [1,2].

The persuasive power of narratives lies in its universal appeal. Health practitioners have, in turn, recognized the importance of employing narratives as health interventions. Although the persuasiveness of narratives has been thoroughly examined by researchers, the cognitive mechanisms behind narrative persuasion appear to vary significantly from other conventional persuasion models, such as the Elaboration Likelihood Model and Heuristic Systematic Model [3,4]. While the persuasive mechanisms of narratives remain obscure, a recent communication model, the Transportation-Imagery Model (TIM) developed by Green and Brock [1], proposes that the persuasiveness of narratives emanate from an altered mental state identified as transportation.

Transportation is a self-induced psychological state in which the individual identifies with a narrative character and is, in turn, influenced by the beliefs perpetuated by characters in the story. Studies have found that transportation is not a constant but can vary greatly depending on the individual and the narrative. Green [3] state that both high and low levels of transportation can be contingent on factors such as message attributes (e.g., story quality, instructions, vividness) and individual attributes (e.g., individual transportability). These two factors are then directly linked to the persuasiveness of a narrative.

Currently, TIM provides a foundation for investigations into the effects of transportation on persuasion, but the current literature offers little insight on the cognitive mechanisms responsible for transportation and its effect on persuasion [1,3,4]. Green's conceptualization of transportation [1] and recent evidence from a number of studies suggest that transportation is highly dependent on both individual and message attributes. Accordingly, this study will investigate transportation through two message attributes (i.e., perspective and vividness) and two individual attributes (i.e., attention and arousal), to further advance the understanding of this cognitive state and demonstrate the effectiveness of TIM as a theoretical model for improving the persuasiveness of health narratives.

Literature Review

Perspective and vividness

Researchers have proposed that a narrative's perspective influences its persuasiveness. Specifically, two narrative perspectives, first-person and third-person, have been examined in health communication research. Winterbottom [5] provide the following definitions. A first-person narrative is an account of an individual's experience conveyed in the first-person. For example, the sentence, 'I

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didn't realize that sending a text message while I was driving would lead to a car crash', is in first-person. A third-person narrative is an account of an individual's experience conveyed in the third-person. For example, the sentence, 'James died in a car crash as a result of text messaging', is in third-person. Few studies have examined the effectiveness of narrative perspective on persuasive power. This study will attempt to examine whether narrative perspective impacts transportation and the pervasiveness of health messages. Therefore, we propose the following hypothesis:

H₁: Narratives in first-person perspective are more effective in eliciting transportation than those narratives in third-person perspective.

A second message attribute, vividness, often refers to the richness of the media elements (e.g., images, video, text) found in a mediated message [6]. Nisbett and Ross define vividness as "likely to attract and hold our attention and to excite the imagination, to the extent that it is (a) emotionally interesting, (b) concrete and imagery provoking, and (c) proximate in a sensory, temporal or spatial way". By emotionally interesting Nisbett and Ross were referring to the identification of the vivid imagery that evoked individual feelings. Emotional interest has been found by researchers to increase the persuasiveness of messages [7].

Since this study will be employing audio narratives, the researcher has chosen to operationalize vividness, in a similar fashion as Baesler and Burgoon [8], through the use of emotiveness, concreteness, and imagery. Emotiveness will be operationalized through stylistic construction. Stylistic construction is based on a reversed form of stylistic analysis developed by Lynch [9]. Stylistic construction involves measuring the syntactic aspects of a message by counting message features (e.g., words, punctuation, or characters) and computing ratios based on these counts. These ratios, in turn, provide a quantitative measure of semantic meaning for emotiveness.

Through stylistic construction, emotiveness will be calculated as the ratio of adjectives plus adverbs to nouns plus verbs [9]. For example, a low emotive sentence "He died in a crash" has a low emotive rating, while the sentence "A young college freshman named Sarah died tragically in a car crash" has a high emotive rating. The emotive index can range from zero to infinity, therefore following Baesler, a level and Burgoon's recommendations of 0.7 will be considered as high emotiveness while a level below 0.5 will be considered as low emotiveness [8].

Concreteness and imagery will be manipulated through the use of descriptive phrases (e.g. unbearable piercing sirens vs. loud sirens), explicit verbs (cleaved vs. split into), and detailed information (e.g. "I sent the text message wru?" vs. "I sent a text message").

In addition to this operationalization of vividness, this study will apply vividness to specific content within health narratives in accordance with the work by Guadagno and colleagues. Guadagno [10] proposed that the inconsistency in studies examining the "vividness effect" can be attributed to manipulating vivid elements of a message that are not of central importance. Subsequently, these background elements may actually detract from the persuasiveness of the other figural elements of the message, thereby creating a type of cognitive interference. Results from the study found that messages emphasizing the vividness of figural elements elicited higher degrees of persuasion compared to messages emphasizing the vividness of background elements.

Overall, these studies highlight the potential of employing vividness to enhance the persuasiveness of a narrative and raises

questions as to the role that vividness may play in the transportation process. Given the role vividness has shown to play in persuasion we propose the following hypothesis:

H₂: PSAs featuring figural vividness will elicit a higher degree of transportation than those PSAs featuring non-figural vividness.

Attention and arousal

Although many definitions of attention exist, attention is commonly defined as the allocation of limited resources to specific environmental stimuli [11]. While there are many aspects of attention, media researchers are mainly interested in the arousal and alertness aspects. Research on alertness has demonstrated that individual's level of attention varies over the duration of a media presentation [12]. Researchers have shown that attention changes occur in response to a number of message production features including images [13] as well as audio [14]. When an individual has an attention change, a set of psychological and physiological patterns occur. Specifically, researchers can identify changes in the heart rate. Therefore, if individuals have a shift in attention during the presentation of stimuli an overall heart rate change will most likely occur. This physiological response can assist researchers in identifying message elements (e.g., vividness that may increase or diminish a transported state. Therefore we propose the following research question.

RQ₁: Does attention correlate with transportation?

Emotions are a central part of being human. As our environment changes we react accordingly, this reaction often includes an emotional response. Media messages have been noted as having three primary goals: to attract attention, to entertain, and to persuade [15]. Narratives are a common form of dramatized scenario designed to meet the three primary goals of media. These goals are partially driven by our understanding of the relationship between entertainment and arousal, mainly that entertainment is fostered by arousal and emotion [16,17] even assert that individual arousal varies throughout narratives as plot elements are introduced and then resolved. Since arousal has been mentioned as one of the three contributing elements of TIM and is often generated by narratives, we pose the following research question.

RQ₂: Does the vividness of a PSA influence an individual's overall arousal level?

Theoretical framework

Since the persuasiveness of a message involves the manipulation of a variety of message elements, it is necessary to establish a theoretical foundation to guide meaningful research. Therefore, this study will employ a theoretical framework that has been used extensively in examining narrative communications, the Transportation-Imagery Model (TIM).

The Transportation-Imagery Model (TIM) proposes that individuals can be absorbed in a narrative and become cognitively, and emotionally involved. This phenomenon, termed *transportation*, occurs between the individual and the narrative. Green and Brock (2000) defined the concept of transportation as "a convergent process, where all mental systems and capacities become focused on events occurring in the narrative" [1].

Ultimately transportation leads to behavioral changes related to the story. When individuals are transported, they become "lost" in another world and as a result lose their abilities to access real-world

facts [1]. For example, individuals may be less likely to construct mental arguments against persuasive messages within the narrative, while immersed in a story. This transported mental state may help elicit emotional responses that in turn can increase the persuasiveness of the narrative.

Transportation is divided into a low and high continuum; a high level of transportation is perceived as being more open to persuasion than the low level. Within the TIM persuasion is moderated by two factors, (a) imagery ability, and (b) absorption. Imagery is the ability of the person to visualize a story. Absorption is the level of attention to which the individual commits to a story [18]. Furthermore, Green and Brock [1] propose three reasons as to why transportation influences personal beliefs and attitudes. First, transportation into a narrative causes the viewer to minimize counterarguments. Creating counterarguments require cognitive resources that might not be available when an individual is completely immersed in a narrative world. Secondly, transportation creates identification with fictional characters and elicits emotional responses from viewers. Identification with fictional characters can create sympathetic links that result in emotional responses [19]. Finally, the vividness and imagery in narratives can help individuals remember the characters and the story. TIM suggests that it is not the vividness/imagery of the pictures alone that evokes attitude change, but the pictures used in conjunction with narrative transportation.

The Transportation-Imagery Model provides an adequate framework for examining both personal and message attributes that contribute to the transportation process, however, the model only speculates about how transportation may influence the persuasion process. Further research needs to be conducted to determine the specific attributes that lead to persuasion through transportation. This study hopes to shed light on these mechanisms.

Method

Participants

A convenience sample of undergraduate college students was employed for this study. A power analysis based on the desired power of 0.80, alpha of 0.05, a medium effect size [20], and a two-tailed test, would require at least 60 participants. A total of 80 participants completed the study, 56 females (70%) and 24 males (30%). Participant ages ranged from 18-28 ($M = 21$, $SD = .46$).

Design

This study employed a 2 narrative perspective (first-person vs. third-person) x 2 vividness (background vividness vs. figural vividness) x 4 story (PSA1, PSA2, PSA3, PSA4) design. In addition, both message length (150 words) and character gender (female) were controlled. The experiment employed a combination of self-report and psychophysiology instruments to measure the effects of the independent variables.

Equipment

The order of the stimuli was presented and randomized through an internal randomization algorithm featured in the Media Lab program. By randomizing the presentation of the stimuli, the likelihood of order effects was decreased.

Stimuli

Four health issues were chosen that were relevant to college students: texting while driving, binge drinking, smoking, and HIV

prevention. These issues have been found to be significant health issues for college students between the ages of 18-24 (CDC, 2011).

The audio PSAs designed for this experiment were based on previously published PSAs. Medium length narratives (75-120 words), with recording times ranging from 2:02 to 2:30 min, were used to control for possible length effects and methodological concerns. Professional voice-actors were employed create all audio recordings.

Audio PSAs were created for this study to reduce the number of confounding variables found in more multimodal mediums such as television. Audio narratives have been used in previous transportation studies, and have been successful in eliciting transportation effects [1,3,13]. PSAs were created following the guidelines described by Escalas [21]. Each narrative was designed to: present an initial event (e.g., introduce a specific health problem), induce a related psychological state (e.g., fear of the consequences), elicit the formation of specific goals (e.g., avoid bodily harm), and identify possible resolutions (e.g., take actions to reduce bodily harm).

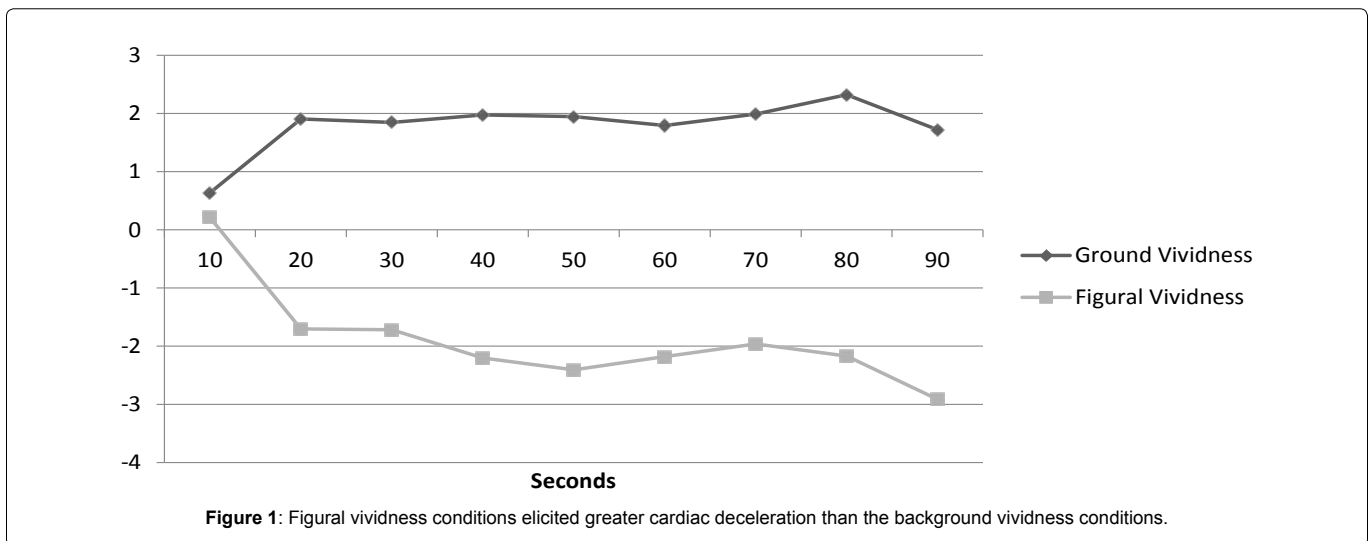
Results

H_1 predicted that narratives in the first-person perspective are more effective in eliciting transportation than those narratives in third-person perspective. To examine this hypothesis a repeated measures ANOVA was conducted examining the effects of within-subjects manipulations of vividness and perspective. No significant effect was found for first-person perspective $F(1,79) = 0.217$, $p = 0.642$, $\eta^2 = .08$.

H_2 predicted that PSAs featuring figural vividness would elicit a higher degree of transportation than those PSAs featuring non-figural vividness. To examine this hypothesis a repeated measures ANOVA was conducted examining the effects of the within-subject manipulations of vividness and perspective on transportation scores. The main effect of figural vividness on transportation was not significant $F(1,79) = 0.001$, $p = 0.981$, $\eta^2 = 0$. Participants who were exposed to the figural vividness conditions had only slightly higher transportation scores ($M = 4.708$) than those who were exposed to the background vividness conditions ($M = 4.706$). However, the interaction between vividness and perspective was significant $F(1,79) = 6.89$, $p < 0.01$. $\eta^2 = .08$. Individuals who were exposed to PSAs with high vividness in third-person had greater transportation scores ($M = 4.82$) than those individuals who were exposed to the PSAs with high vividness in first-person ($M = 4.59$).

RQ_1 asked if vividness influenced attention. To evaluate this hypothesis a repeated measures ANOVA was conducted examining the effects of within-subjects manipulations of vividness and perspective on heart rate change. As expected, the main effect for vividness was significant $F(1, 38) = 6.624$, $p < 0.05$, $\eta^2 = .148$. Participants who were exposed to manipulations of figural vividness exhibited greater average heart rate change ($M = 1.36$) than those who were exposed to the background vividness conditions ($M = -.95$). Details of the average heart rate change are illustrated in Figure 1.

RQ_2 asked whether the vividness of a PSA could influence an individual's overall arousal level. Data from the skin conductance responses were analyzed via repeated measures ANOVA procedures. One participant was excluded from the SCL analysis due to excessive artifacts in the data record. The ANOVA revealed a significant effect for vividness $F(1, 78) = 14.44$, $p < 0.001$, $\eta^2 = .156$. Post-hoc pairwise comparisons revealed that participants demonstrated a greater number of non-specific skin conductance responses for the



figural vividness conditions ($M = 3.91$) compared to the background vividness conditions ($M = 3.0$).

Discussion

The current study examined the Transportation-Image Model in the context of health-communications. The dominant finding of this study was the relationship between vividness and perspective as possible moderators of transportation. Results from the study indicated that individuals who were exposed to narratives with figural vividness in third-person had greater transportation scores than those who were exposed to narratives with background vividness in first-person. In contrast, individuals who were exposed to narratives with background vividness in first-person had higher transportation scores than those who were exposed to background vividness in third-person.

To explain this finding, it is necessary to touch on two related concepts, self-concept and self-referencing. The self or self-concept can be roughly conceptualized as an organized memory structure containing a cohesive set of semantic and episodic memories collected over a lifetime [22]. In turn, self-referencing involves “processing of information by relating it or the self-structure or aspects of it” [22]. These two constructs work together in retrieving memories and creating imagery from external or internal stimuli in respect to the self. Studies in autobiographical memory retrieval and advertising have found that differences self-referencing can influence the amount of contextual details or vividness that is employed in imagery creation [23].

Therefore, it is proposed that the degree of transportation is partially contingent on whether the narrative evokes strong retrospective self-referencing (i.e., recalling past memories) or anticipatory self-referencing (i.e., imagining future events). For example, in the background vividness condition the lack of specific contextual details (e.g., low emotive sentences) allowed the individual to rely more heavily on retrospective self-referencing to construct mental imagery. In contrast, the figural vividness condition provided an abundance of contextual details, prompting participants to engage in anticipatory self-referencing and construct mental imagery from details provided by the PSAs and not from past memories.

Visual perspective may also contribute to the activation of self-referencing. While perspective and mental imagery are closely

related, researchers found that individuals do not always engage in first-person perspectives when creating visual imagery [24]. In fact, autobiographical research demonstrated that when engaging in autobiographical memory retrieval, individuals preferred to engage in third-person perspective when visualizing autobiographical memories and future actions that conflicted with their present self-concept.

In light of the above research it is reasonable to assume that similar effects can be found in transportation. Transportation involves the creation of mental imagery and is closely associated with the concept of identification. Green et al. [18] even suggested that identification might be a prerequisite for transportation. Identification and transportation may depend on the how the main character of the narrative either aligns or conflicts with an individual’s self-concept. For example, a law-abiding citizen may have difficulty identifying with a character in a narrative that has committed first-degree murder. The law-abiding citizen will therefore be more likely to engage in mental imagery from the third-person perspective. In comparison, if a narrative character displays characteristics and traits similar to an individual’s self-concept, the individual is more likely to use first-person perspective in mental imagery (Table 1). In this study, all PSAs featured negatively portrayed main characters facing a life-threatening situation with an unresolved or unpleasant outcome.

The question then arises as to why transportation still occurs in situations where there is a distinctive contrast between the identity of a narrative character and the individual’s self-concept. We propose that the third-person perspective provides enough psychological distance between the character and self-concept (by decreasing retrospective self-referencing) to allow a temporary alternative self to be constructed in the imagination (formed from the contextual details from the narrative). Therefore, the highest transportation scores result from the conditions of third-person perspective and figural vividness.

The second highest transportation (first-person, background vividness conditions) scores can also be explained through this interpretation. The first-person perspective and background vividness conditions allowed for increased identification with the character through retrospective self-referencing. These conditions allowed for more transference of self-concept into the character thus resulting in a moderate degree of transportation. The lowest transportation scores

Table 1: Analysis of Variance Results.

Source of Variation	Sum of Squares	d.f.	Mean Square	F	Sig. of F
Transportation					
Vividness	.14	1	.14	.22	.64
Perspective	.00	1	.00	.00	.98
Interaction	2.79	1	2.79	6.89	.01
Vividness					
Attention	2223.1	1	2223.1	6.62	.014
Arousal	62.03	1	62.03	14.44	.000

were found in the mixed conditions (i.e., first-person/figural vividness and third-person/background vividness). This study proposes that low transportation occurred in these conditions due to the conflict between self-concept and the narrative character. For example, a PSA in third-person featuring background vividness prompted the participant to engage in third-person imagery creation, but the lack of contextual details in the PSA prompted a greater degree of transference of self-concept into the character resulting in cognitive dissonances and low transportation.

Conclusion

In summary, the findings of this study advanced questions raised in previous transportation studies [1,4,18]. The overall implications of this research are two-fold. Theoretically, this study advanced the Transportation-Imagery Model by identifying two potential moderators of transportation (vividness and perspective) and thereby provides the basis for an extended model of transportation. The findings of this study also hold considerable practical significance. The results show that health communicators can enhance the effectiveness of communication messages by employing message elements that enhance transportation.

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