

**Understanding the Interplay of Life Satisfaction, Impact of Public Health Crises, Narrative  
Transportation, and Mind Wandering**

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## Abstract

The proposed study is a research proposal that examines how individual difference trait and state variables influence the experience of a clip from the 2011 film, *Contagion* that portrays a pandemic similar to Covid 19. Then participants will perform a mundane reading task and the rates of mind wandering instances away from this task will be recorded. Research on narrative transportation (becoming totally immersed in a film) shows that the higher the immersion in a film, the more the information in the film can influence and persuade mindsets (Green & Brock, 2000). Additionally, research by Bekalu et al. (2017) showed that narrative transportation induces increased mind wandering when viewing a narrative-based video clip relative to a non-narrative-based video clip. A recent study by Trzebiński et al. (2020) showed that that higher level of meaning in life, life satisfaction, and positive social outlook corresponded with a less stressful and less anxious reaction to COVID-19. Therefore, we plan to measure participants on each of these variables (meaning in life, life satisfaction, etc.) and hypothesize that those who score high on these measures will show less immersion while watching the film clip from *Contagion* and accordingly will show less film clip related mind wandering in a task administered after the film.

## Introduction

Narrative transportation describes the psychological phenomenon by which an individual's beliefs, attitudes, values, attention, or focus may be altered by reading or viewing a narrative. Gerrig first coined the term and described it as the experience of "entering the world evoked by a narrative because of empathy for story characters and imagination of the story plot" (Gerrig, 1993; Van Laer, et al. 2014). Other researchers such as Slater & Rouner (2002), and Green (2008) have shown that viewing or reading a narrative can influence an individual to develop a deep connection with the characters they identify with and can result in an attitude change that reflects the attitudes or beliefs of the character with whom the person identifies.

Narrative transportation occurs when a person is completely engrossed, or "lost", in the story they are reading or viewing. The components of the narrative that cause this phenomenon are: imagery, attention, and emotion (Green & Brock, 2000). These elements combine to create a comprehensive and immerse experience that transports the viewer or reader where they can experience the characters' emotions and feelings for themselves. Green and Brock describe transportation including "vividness", when the viewer or reader feels that the narrative is a real experience, and "identification", when the viewer or reader identifies with a character in the story and feels that the same situations or events could happen to them as well (Green & Brock, 2000; Hinyard & Kreuter, 2007). In fact, a growing body of research suggests that attention and persuasive messages are enhanced due to the nature of a narrative, and the ability of a narrative to transport the viewer "into the narrative world" (Green & Brock, 2000). These different facets give narrative transportation interesting psychological properties including the ability to persuade individuals in advertising and public health campaigns, and have sparked research interests into how narrative transportation modifies memory and attention. Narrative transportation influences

responses to narrative messages because it can “reduce counter-arguing and scrutinising of information” (Green & Brock, 2000). Healthcare advertising agencies have utilized narrative transportation to their advantage in the past. These advertisements have focused on the negative health effects of tanning bed use, alcohol consumption education, smoking cessation, and vaccination promotion, and have been shown to be effective (Chang, 2008; Slater & Rouner, 1996; Kim, et al. 2012; Murphy, et al. 2013). Furthermore, researchers believe that the effectiveness of narrative transportation in public health related advertisements is due to the “self-referencing mental simulation” (Escalas, 2004). During this self-referencing mental simulation, recipients of the message create mental images of the events depicted and mentally simulate what they would do if they were the main character in the narrative. In fact, two neuropsychology experiments have shown that self-referencing mental simulation is “more powerful in explaining health-related behavior changes than self-reported attitudes and intentions” (Falk, et al. 2010). In one of these studies, participants were shown a persuasive narrative message about sunscreen use, and researchers showed that neural firing in the medial prefrontal cortex (related to self-related information processing) predicted behavior changes beyond self-reported measures. One can see that self-referencing mental simulation, as evoked by narrative transportation, can be heavily influential in determining behavioral outcomes.

Bezdek and colleagues ran a study in which they used fMRI techniques to track participants’ brain activity while they viewed various movie clips. They specifically focused on attention levels during suspenseful moments of the movie clips (which were pre-labelled by the researchers). Results showed that participants’ attention increased significantly during the suspenseful moments. This was the first study that showed brain imaging data in support of narrative transportation, and the attentional modulation due to changes in narrative content

(Bezdek, et al. 2015). Furthermore, Bekalu compared the effects of narrative transportation on participants who viewed narrative film clips versus participants who viewed non-narrative informational videos. They then administered a memory test to see how much information they had gleaned from the two videos. The participants were shown spliced clips of approximately equal time length. One clip was from the 2011 film *Contagion*, and the other clip was from the American Red Cross YouTube channel regarding pandemic influenza (Bekalu, et al. 2017). Both the clips were spliced professionally to provide the same amount of informational content regarding pandemic influenza, and proper disease control, response, and prevention measures. This allowed the researchers to control the amount of information conveyed to the viewer. The participants were given both a pre- and post-viewing questionnaire about preventative measures and perceived response efficacy regarding pandemic influenza (Bekalu, et al. 2017). Bekalu found that the non-narrative format was more effective than the narrative format because the non-narrative format was better at communicating information succinctly and efficiently, and in a way that participants would remember it. The information was conveyed in a more direct fashion (Bekalu, et al. 2017). However, this study still showed that narratives and non-narratives can differ in how they modulate an individual's viewing experience, the memories they take from that experience, and the attitudes or responses they have toward the clips they have watched.

Narrative transportation has been shown to influence the degree of mind wandering. Schooler and Smallwood (2015) discuss the profound nature of mind wandering and the science behind understanding the stream of human consciousness. In fact, research has shown that a system of brain regions on the medial surface of the cortex, known as the "default mode network", has been implicated in many functions of mind wandering (Greicius et al. 2003,

Raichle, et al. 2001). “This network is active when participants engage in the sort of thinking that occurs during mind wandering, such as thoughts about the future, of themselves, or of other people” (Andrews-Hanna, et al. 2014). fMRI and traditional “pencil and paper” methods of tracking mind wandering have allowed researchers to delve deep into how a person’s brain focuses on tasks.

In a previous experiment in Dr. Cohen’s Experimental Psychology class, we hypothesized that a narrative, due to its inherent ability to transport an individual, would have a significantly greater effect on mind wandering and distractibility when performing another subsequent unrelated task, relative to a non-narrative. The narrative and non-narrative video clips were obtained from Bekalu et al. (2017) which compared the effects of narratives versus non-narratives on memory, regarding pandemic influenza (Bekalu et al., 2017). In this study, mind wandering was measured using a self-report tally mark system to record a participant’s mind wandering instances. Participants were divided into two conditions. In the narrative condition, participants watched the film clip from *Contagion*, and in the non-narrative condition, participants watched the American Red Cross YouTube video. Each group was comprised of approximately 10 Yeshiva University undergraduate psychology students, and the video presented to the groups alternated between the narrative and non-narrative so that there would be an even number of participants in each condition. They were then instructed to read a short excerpt from a passage obtained on the internet that was unrelated to the content they had previously watched. They were told to place a tally mark on a sheet of paper each time their mind wandered while reading. There were two columns on the sheet of paper. One column represented mind wandering instances related to the narrative and one column represented mind wandering instances related to other random matters (i.e. what they were going to eat for dinner

or whether they would go to the gym tonight, etc.). Results showed that participants who viewed the narrative clip reported significantly more mind wandering instances in response to the content of the narrative video clip compared to those who viewed the non-narrative video. This supported the hypothesis that narrative transportation induces significantly more mind wandering when performing other tasks.

Studies have shown that narrative transportation has a large impact on perception of healthcare outcomes. Dillard has shown that narrative messages can be an effective strategy to “increase risk perceptions and motivate preventative behaviours related to cancer” (Dillard, et al. 2017). In this study, women who frequent tanning salons were recruited and instructed to read a narrative about a female college student who had discovered a cancerous mole as the result of going to tanning salons often. After reading the message, they were told to complete surveys that would measure the degree of narrative transportation, risk perception, and follow-up behavioral intentions. Results showed that narrative transportation was positively correlated with behavior to do skin exams, talk to a medical professional, research further about skin cancer, and reduce their exposure to harmful ultraviolet radiation. Furthermore, the study showed that there was a higher degree of “gut-level feeling of risk” for developing skin cancer among the participants who read the narrative (Dillard, et al. 2017). Green (2006) explains that narrative transportation enhances the power of these cancer narratives because it reduces a person’s tendency to “respond defensively to threatening cancer risk information, or it could help individuals vividly imagine especially difficult screening procedures”. This study shows the importance of narrative transportation in influencing perceptions about health outcomes and risk.

Another study, conducted by Deng and colleagues investigated COVID-19 advertisements. This study explored why certain advertisements were being used and what made

these advertisements effective. The researchers gathered 354 advertisements concerning COVID-19 from 49 countries (Deng, et al. 2020). The advertisements were rated by coders regarding the degree of narrative transportation in the advertisement. Results showed that the advertisements were “more likely to employ narrative transportation as a message strategy” (Deng, et al. 2020). The researchers believed that the narrative transportation strategy was employed because it would transport viewers into a health situation they had never experienced previously, and would cause them to identify with the characters or story being told in the advertisement. As shown in the Dillard study above, narrative transportation can be a powerful persuasive tool, and can cause changes in the beliefs, perspectives, and attitudes of the viewer. Therefore, these advertisements used narrative transportation to put individuals who may or may not be affected by the virus into the mindset and attitude of people who are being severely affected by the virus. This, it was hoped, would cause them to wear masks, quarantine, wash their hands, and take other preventative measures. Thus, this research supports the idea that narrative transportation can be used to persuade individuals regarding actions to take during public health crises, and has been especially utilized during the COVID-19 pandemic (Deng, et al. 2020).

COVID-19 has had a wide-ranging impact on the lives of people across the world. It has induced fear regarding loss of employment, concern for physical well-being, and possible breakdown of emotional and mental health. Predictions about the consequences of COVID-19 are uncertain because of the erratic and unknown nature by which the coronavirus interacts with individuals. Accordingly, this pandemic can cause panic and “catastrophic interpretation and prediction of events, irrational actions, and—as a consequence—the increasing probability of psychological dysfunctions” (Trzebiński, et al. 2020). The uncertainty and unpredictability of the consequences of COVID-19 can influence the thinking, emotions, actions, and visions for the

future that individuals have. In other words, thoughts about the future of COVID-19 can easily impact the day-to-day functioning of people around the world. Trzebiński researched whether meaning in life, life satisfaction, and beliefs in orderliness and positive social outlook would influence responses to COVID-19. They hypothesized that higher level of meaning in life, life satisfaction, and positive social outlook would correspond with a less stressful, less anxious, and more personally reflective outlook, on the difficult situation of COVID-19 (Trzebiński, et al. 2020). This hypothesis is built into the growing body of literature supporting the idea that meaning in life and life satisfaction positively impact mental and physical health, and provide better cognitive and social functioning. Trzebiński also focuses on Basic Hope (positive social outlook), a concept created by Erik Erikson (Erikson, 1968). Basic Hope is a personal characteristic that involves forward thinking and positive thoughts about the future of the world at large. Research has shown that Basic Hope has many positive consequences including engaging in new experiences, altruistic behavior, and forgiveness. Research has also shown that Basic Hope is involved in resilient behavior and adaptive reactions (Trzebiński, et al. 2020). Trzebiński used various surveys to measure state anxiety (STAI), satisfaction with life (SWLS), meaning in life (MIL), Basic Hope (BH), and COVID-19 stress (Spielberger, 1983; Diener, et al. 1985). These surveys helped to determine if there was a correlation between the different factors the researchers were measuring. Results from the study supported the hypothesis that a higher level of meaning in life, life satisfaction, and positive social outlook would result in reduced stress, panic, and concern regarding the COVID-19 pandemic and future of the world.

### **Current Study**

Overall, these studies have shown the impact that COVID-19 has had on the world. Furthermore, they show the importance of narrative transportation in perception of healthcare

and public health issues, and how it can be utilized to encourage certain behaviors that will benefit a person's health and wellness. The current study proposes to build upon both the Trzebiński study, as well as the narrative transportation and mind wandering study conducted in Dr. Cohen's Experimental Psychology class. It is hypothesized that a higher level of meaning in life, life satisfaction, and positive social outlook will reduce stressful thoughts regarding COVID-19, and in turn will reduce the amount of narrative transportation that occurs when watching the *Contagion* video clip. It is also hypothesized that this will cause a reduction in mind wandering instances among the people who show a higher level of meaning in life, life satisfaction, and positive social outlook. *Contagion* is a 2011 film directed by Steven Soderbergh that focuses on a pandemic influenza outbreak and follows the lives of healthcare professionals, government officials, and regular citizens as the government works to find a cure for this disease. The *Contagion* film closely mirrors the experience many have endured during the COVID-19 pandemic. Therefore, as a viewer, this will be a good approximation for the current COVID-19 experience. It has been shown previously that ongoing major media topics reduce reflective thinking. Limited reflective thinking can cause individuals to ruminate about worst-case scenarios and evoke high levels of fear and state anxiety (Trzebiński, et al. 2020). However, it has been shown that higher levels of meaning in life, life satisfaction, and positive social outlook act as a "buffer" against negative thoughts and state anxiety (Trzebiński, et al. 2020). Thus, it is hypothesized that having this blend of personal characteristics will cause a participant to be less affected by the narrative transportation induced by the film clip from *Contagion*, even though the film is about a public health crises with which the world is currently suffering. In contrast, it has been shown that a person with lower levels of meaning in life, life satisfaction, and positive social outlook will have an increased stress response to COVID-19 (Trzebiński, et al. 2020).

Therefore, it is assumed that this stress response will be mirrored when viewing the *Contagion* film, and narrative transportation (and subsequently mind wandering) will increase. As stated above, intense and suspenseful film clips can induce an increased focus and attention on the narrative (implying narrative transportation has occurred), and narrative transportation causes an individual to morph their beliefs, attitudes, and perspective to the characters in the story.

Therefore, we predict that people with higher anxiety and stress about COVID-19 may exhibit this stress when watching the *Contagion* film clip and show a higher degree of narrative transportation and subsequent mind wandering.

## **Method**

### *Participants*

Participants will be recruited from among Yeshiva University undergraduate psychology students who have provided informed consent to participate in the experiment. Participation will also be extended to the general student population through the SONA recruitment system.

### *Procedure*

Participants will be invited into the laboratory in groups of approximately 10. First, they will fill out the same five scales presented to the participants in the Trzebiński experiment, including: the State-Trait Anxiety Inventory (STAI), the Satisfaction with Life Scale (SWLS), the Meaning in Life Scale (MIL), the Basic Hope Scale (BH), and the COVID-19 Stress Scale (Trzebiński, et al. 2020). The scales and specific questions are adapted from the Trzebiński paper. As performed in the Trzebiński experiment, The STAI scale will be presented first to measure the current anxiety levels of the participant. The next scales will be presented to the participant randomly. Mean, median, and mode scores on the SWLS, MIL, and BH will be collected. The median score will be used to develop a median split among participants.

Trzebiński has shown that higher scores on the SWLS, MIL, and BH correlate with lower scores on the COVID-19 stress scale (Trzebiński, et al. 2020). Therefore, the COVID-19 stress scale will be used as the base score for developing a median split. The participants will be divided into two groups. One group will be comprised of participants who scored below the median for COVID-19 stress. The other group will be comprised of participants who scored above the median for COVID-19 stress. It is logical to use the COVID-19 stress scale to divide the groups because it reflects higher scores on the SWLS, MIL, and BH and (as shown in the Trzebiński study), and it allows for possible correlations to be drawn between levels of anxiety and fear of COVID-19 and the degree to which narrative transportation and mind wandering will occur in various participants (Trzebiński, et al. 2020).

After dividing the participants' responses by median split into those who report low or high on these scales, they will be shown the *Contagion* clip used in the Bekalu study and in the study conducted in Dr. Cohen's Experimental Psychology course. Subsequently, participants will perform the mind wandering task, in which they will be given a dense and mundane reading passage obtained from the internet. They will also be given a piece of paper with a line down the middle. The left-hand side will show the heading "clip-related", and the right-hand side will show the heading "unrelated". They will be instructed as follows:

"You will have 4 minutes to read the following passage. While reading the passage, should you think about anything related to the *Contagion* clip you just saw, you will place a tally mark on the side of the page that says, 'clip related'. Should you think about anything completely unrelated to the clip, but not related to the story you are reading, such as what you are going to have for dinner tonight or what classes you have tomorrow,

then you will place a tally mark on the right-hand side of the page that says ‘unrelated’.

Thank you for your participation.”

The instructions above describe the mind wandering task that the participants will perform. The results in the previous experiment showed that narrative transportation led to a higher number of mind wandering instances. Thus, the mind wandering task will show the degree to which narrative transportation occurred while they were viewing the *Contagion* clip.

### **Results**

This paper is a thesis proposal, and no data were collected due to COVID-19. However, in the case that data were collected, we would conduct correlation analyses to examine whether the predicted relationships were observed. Specifically, based on literature reviewed, we would expect that those in the group that exhibited higher ratings of level of meaning in life, life satisfaction, and Basic Hope (positive social outlook) would show reduced narrative transportation and correspondingly lower rates of mind wandering. Accordingly, we would predict higher levels of narrative transportation and mind wandering instances for those individuals who exhibit lower levels of meaning in life, life satisfaction, and Basic Hope.

An independent t-test will be conducted to assess whether there are significantly more mind wandering instances recorded in the high COVID-19 stress group compared to the low COVID-19 stress group. The data obtained would allow for the establishment of a relationship between COVID-19 stress and how this influences narrative transportation and subsequent mind wandering instances.

### **Discussion**

In summary, we expect that a higher level of meaning in life, life satisfaction, and positive social outlook will be associated with reduced stress, anxiety, and fear, related to

COVID-19. In turn, this will cause a reduced stress response when viewing *Contagion*, a movie which depicts a similar chain of events to ones experienced by individuals during the COVID-19 pandemic. The reduced stress and anxiety caused by a higher degree of meaning in life, life satisfaction, and positive social outlook will reduce the degree of narrative transportation while viewing the film clip, leading to lower levels of mind wandering in a subsequent task.

There are many implications regarding the potential results gathered from the study. Should the aforementioned relationship between COVID-19 stress and degree of narrative transportation and mind wandering be established, it would show that stress, anxiety, fear, meaning in life, life satisfaction, and positive social outlook are all personal characteristics or feelings that can act as buffer to cognitive processes such as narrative transportation. This is very powerful and would support previous results from studies which show that suspenseful or intense movie scenes can induce increased viewer attention, but that this effect can be modulated by variables such as the ones measured in this study (e.g. life satisfaction). It has been previously shown that narratives, when compared to non-narratives, significantly increase instances of mind wandering when performing another task. However, the results obtained from this study would provide a caveat to results from the previous study. The current results would show that feelings and attitudes can modulate attention and the degree to which participants are influenced by narrative transportation. Personal characteristics such as, stress, anxiety, fear, meaning in life, life satisfaction, and positive social outlook can influence how individuals react to audiovisual stimuli and whether it evokes a stress response in the participant.

Furthermore, results from this study have a more general public health implication. Reactions to public health issues or crises can vary significantly as shown by the Trzebiński et al. (2020) study. It is important to know what variables predict how each individual perceives a

public health situation. Should the results of this study support the hypothesis, it would imply that a person's personal attitudes and traits influence the way they perceive public health issues.

Results from this study could have wide-ranging implications in how advertisements are conveyed to the public, specifically about public health issues. Given what we know about the impact of narratives and non-narratives on persuasiveness of information (e.g., Bekalu, et al. 2017), perhaps public health advertisements that depict information through the use of narratives would be more impactful in communities with higher levels of personal satisfaction and less stress regarding the public health issue. Whereas, non-narrative may be more effective in communities with lower levels of personal satisfaction and higher stress regarding the public health issue. Advertisements are an essential method of communication utilized by public health professionals and disease control agencies in warning the public of potential harm that could occur if the pathogen is not controlled properly. A future longitudinal study could investigate whether narrative advertisements or non-narrative advertisements are more impactful in modifying behavioral reactions to public health information conveyed through these different methods of delivery. Furthermore, future studies could include the stress and anxiety variable used in the current study to assess whether higher levels of stress and anxiety makes it more likely that individuals will modify their behavior regarding public health safety (i.e. wearing a mask, social distancing, etc.).

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