EXAMINING CANCER NARRATIVES IN THE NEWS AS A TOOL FOR REDUCING PSYCHOLOGICAL DISTANCE TO COLORECTAL CANCER IN YOUNG ADULTS: A CONSTRUAL LEVEL PERSPECTIVE

by

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(Under the Direction of Chelsea Ratcliff)

ABSTRACT

News stories about cancer often feature individual narratives, yet their impact on risk perceptions and behavioral intentions remains largely understudied. The current study compared the effects of narrative and non-narrative cancer news articles in a 2 (narrative vs. nonnarrative) x 2 (image of person vs. image of object) design. Adopting construal level theory as a framework, I examined whether narrative message formats would be more effective at influencing prevention and detection behaviors by reducing young adults' psychological distance to colorectal cancer. Exposure to a cancer narrative resulted in higher message engagement, which in turn led to reduced psychological distance toward colorectal cancer, and increased risk perceptions and behavioral intentions. This study provides initial support for potential relationships between the dimensions of psychological distance outlined by construal level theory and identification and transportation, two key components of message engagement.

INDEX WORDS: Cancer communication, narrative persuasion, construal level theory, message engagement

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TABLE OF CONTENTS

LIST OF TABLES

Page

LIST OF FIGURES

Page

CHAPTER 1

INTRODUCTION

Colorectal cancer has been on the rise in young adults, with incidence rates growing by 1.8% annually since 2012 (Akimoto et al., 2021). Having long been labelled an "old person's disease," colorectal cancer is likely not on the radar for many young adults, especially given that colonoscopies are not recommended until the age of 45 (Akimoto et al., 2021). The majority (63%) of young adults with colorectal cancer are diagnosed in advanced stages, indicating that their diagnoses are delayed (Akimoto et al., 2021). While it is possible that physicians may be partially to blame for delayed diagnoses, it is more likely that, given a lack of engagement in detection behaviors, young adults are not monitoring for or aware of colorectal cancer symptoms (Deen et al., 2016). Not only are young adults unlikely to be engaged in detecting colorectal cancer, but they are also unlikely to be taking key steps towards cancer prevention due to decreased risk perceptions (Kyle et al., 2012; Sarkar et al., 2018; Xu & Odum, 2019). Although raising awareness is important, getting young adults to perceive *themselves* to be at risk for developing colorectal cancer has been identified as a potential obstacle for health communicators and the medical community as a whole (Salimzadeh et al., 2016; Loomans-Kropp & Umar, 2019).

Construal level theory of psychological distance (CLT) may shed light on young adults' low cancer risk perceptions and lack of engagement in cancer-related detection and prevention behaviors, while also offering potential strategies for message design to overcome these challenges. CLT asserts that individuals create mental representations of various events and that

these representations will be construed at either a high level or low level depending on one's perceived psychological distance to that event (Trope & Liberman, 2003; Trope & Liberman, 2010). Events that are perceived to be psychologically distant, or unlikely to happen in the near future, are construed at a higher level, and thus more abstractly, which has been demonstrated to decrease individuals' self-risk perceptions (Chandran & Menon, 2004; Trope & Liberman, 2010).

Narratives have been proposed as a potential tool for decreasing young adults' psychological distance to health issues, as, potentially, through message engagement, a health risk becomes more "real" (i.e., more concrete and less distant; Kim & Nan, 2016). News coverage related to cancer often contains personal narratives, in which individuals share their own experiences of being diagnosed with cancer (Macdonald et al., 2018). These narratives aim to educate the public about cancer risks and raise awareness among specific populations (Macdonald et al., 2018). Although narratives have been studied heavily in the realm of health communication (Shen et al., 2015; Balint & Bilandzic, 2017), and, specifically, in the context of cancer prevention and detection (e.g., Mathieson & Stam, 1995; Kreuter et al. 2007; Niederdeppe, 2008; Krakow et al., 2017), few, if any, studies have examined the efficacy of cancer narratives in reducing psychological distance to cancer and, in turn, influencing behavioral intentions related to prevention and detection behaviors.

Given the growing prevalence of colorectal cancer in young adults (Akimoto et al., 2021) and calls to focus on designing messages that heighten young adults' cancer risk perceptions (Alaa & Shah, 2019; Jiang & Liu, 2021), the potential relationships between narrative message format, psychological distance, and behavioral intentions warrant empirical investigation. The present study seeks to answer these important calls for further research by examining the efficacy

of cancer news narratives (compared to non-narratives) in reducing psychological distance to colorectal cancer for young adults and probing underlying mechanisms that help explain these effects.

CHAPTER 2

LITERATURE REVIEW

This chapter provides an overview of relevant literature in narrative persuasion, cancer communication, and construal level theory research in health communication. Hypotheses and research questions are introduced following an overview of relevant literature.

Cancer Narratives in the News Media

The news media serves as a key source of information about cancer, educating the public about risk factors, preventative measures, treatment methods, and the latest findings from cancer research (Macdonald et al., 2018). The way in which this information is presented varies, with some cancer-related news articles focusing on purely factual health information being relayed from experts and government entities, while others feature personal narratives in which an individual recounts their own experience with developing a particular type of cancer (Atkin et al., 2008; Macdonald et al., 2018). Comprehensive analyses of cancer news coverage have found that personal cancer narratives appear in the news twice as often as articles that solely report statistics and information from health experts (Atkin et al., 2008) and account for almost a quarter of cancer-related news coverage (Adwetewa-Badu et al., 2021). Personal narratives tend to contain the same types of information as non-narratives, including cancer symptoms, risk factors, and guidance for prevention and detection, but they do so within the context of an individual's (or group of individuals') experiences (Atkin et al., 2008; Macdonald, 2018).

Much of the extant research on cancer narratives in the news focuses on media coverage of celebrities' cancer diagnoses, finding that these narratives play an influential role in

motivating individuals to take steps toward both prevention and detection (Chapman et al., 2005; Niederdeppe, 2008; Walter, 2010; Myrick et al., 2013; Ashton & Feasey, 2014; Yerramilli et al., 2015). Although celebrity cancer narratives have been demonstrated as being effective at influencing behavioral intentions, they have also been on the receiving end of much criticism for potentially glamorizing cancer, instilling false senses of hope in the public, and publicizing treatment options that may not be available or accessible to most individuals (Dubriwny, 2009; Ashton & Feasey, 2014; Borzekowski et al., 2014). Despite these concerns, scholars have lauded celebrity cancer narratives in the news as an important – and effective – tool for educating the public about cancer prevention, detection, and treatment options (Chapman, 2005; Beck et al., 2014). While this phenomenon – dubbed the "Angelina Jolie Effect" after the actress's 2013 New York Times op-ed about her preventative mastectomy (Liede et al., 2018) – has been widely studied, studies have yet, to my knowledge, examined cancer narratives in the news featuring "average" individuals, despite their prevalence (Atkin et al., 2008; Macdonald, 2018). In other health contexts, including smoking cessation and ibuprofen use, personal narratives from non-celebrities have demonstrated efficacy in influencing behavioral intentions (Kim et al., 2012; Shaffer et al., 2018). As such, personal narratives from non-celebrities within the context of cancer may be an effective message format for motivating the adoption of cancer prevention and detection behaviors.

Narratives in the news, in general, are understudied, with a recent content analysis finding that only 4.5% of narrative studies utilized news articles (as opposed to other message types) as stimuli (Dahlstrom et al., 2017). Scholars have argued that more research is needed to understand how health-related narratives in the news can influence individuals' risk perceptions and subsequent behavioral intentions (Shaffer et al., 2018). By examining the efficacy of cancer

narratives featuring non-celebrities in influencing behavioral intentions, the present study fills critical gaps in knowledge.

Message Engagement and The News

Message engagement involves audience members' investment in and involvement with characters and storylines (Green & Brock, 2000; Moyer-Gusé, 2008). While the purpose of a narrative may be to persuade an audience, message engagement allows the audience to become immersed in the story, disguising – and thus enhancing – its persuasiveness (Moyer-Gusé, 2008). For news stories, message engagement encompasses identification and transportation (Kim et al., 2012). Identification refers to how members of an audience are able to relate to the person or people in a narrative, either real or fictional (Cohen, 2001; Larkey & Hill, 2012). Transportation, on the other hand, refers to the way in which individuals are able to become absorbed in a story and experience its events almost as if they are experiencing them in real life (Green & Brock, 2000; Larkey & Hill, 2012). Message engagement plays a key role in influencing an audience's perceptions, attitudes, and behavioral intentions (Murphy et al., 2013; Frank et al., 2015; Collins & Lazard, 2020).

Previous studies have found that audiences experience message engagement when reading personal narratives about health issues in the news, resulting in increased risk perceptions and behavioral intentions (Kim et al., 2012; Oliver et al., 2012; Tamul et al., 2021). In the context of smoking cessation, Kim et al. (2012), for example, found that news articles that featured personal narratives elicited higher message engagement than news stories that did not which in turn influenced behavioral intentions to quit smoking. Similarly, Tamul et al. (2021) found that participants who read a news article that contained a personal narrative about engaging in risky behaviors experienced higher message engagement, and subsequently,

behavioral intentions, compared to those who read a non-narrative news article. In light of these findings, I pose the following hypothesis:

H1: Exposure to a narrative (vs. nonnarrative) message format will result in greater message engagement.

While many empirical investigations have examined message engagement as a predictor of key behavioral outcomes, it is possible that message engagement triggers other psychological processes that may help explain the efficacy of narratives, which requires further research (Balint & Bilandzic, 2017). This has been identified as an important step for advancing our understanding of narratives as a health communication tool (Balint & Bilandzic, 2017). As such, I now turn my attention to a theoretical framework that, when combined with key aspects of message engagement, may expand our understanding of the utility of cancer narratives at motivating prevention and detection behaviors.

Construal Level Theory and Health Communication

Construal level theory of psychological distance posits that individuals are firmly grounded in the present, with limited ability to think beyond the "here and now" (Trope & Liberman, 2010, p. 440). As such, events that are perceived to take place in the distant future are represented at a higher construal level than events that are perceived to take place in the near future. A higher construal representation will consist of more abstract aspects of an event, whereas a lower construal representation will consist of concrete details of an event. There are four dimensions of psychological distance, as outlined by CLT, that influence the extent to which a threat is perceived to be abstract or concrete: temporal, spatial, social, and hypothetical (Trope & Liberman, 2010). According to CLT, an event that is psychologically distant, on one or more

of these dimensions, will be construed at higher levels than more proximal events (Trope & Liberman, 2010).

In the context of health communication, scholars have argued that considering future health threats requires high levels of mental abstraction (Chandran & Menon, 2004). Threats that are perceived to be immediate are easier for individuals to grasp – and thus take preventative measures against – whereas threats that are perceived to be future concerns, or not concerns at all, are perceived to be more abstract and thus more psychologically distant. Future threats, due to the level of mental abstraction required to imagine them actually taking place, often times fail to prompt immediate action from individuals (Chandran & Menon, 2004; Trope & Liberman, 2010). Previous research has indicated that many health issues, including opioid overdose, consequences from smoking, and tooth decay from poor oral hygiene, are psychologically distant for young adults (Monestal-Umaña & Schulz, 2015; Kim & Kim, 2018; Qin et al., 2020). There have been limited examinations, however, into young adults' psychological distance to developing cancer (Kim, 2019). Notably, Kim (2019) found that developing a rare form of cancer is psychologically distant for young adults. It is quite possible, therefore, that the threat of developing colorectal cancer is psychologically distant for young adults as well, which may decrease their risk perceptions and intentions to prevent and monitor for it.

Although CLT was born in the field of psychology, communication scholars have gravitated towards it in recent years, identifying it as a potentially fruitful theory for guiding the development of persuasive messages (Lee, 2019). The basic tenets of CLT can inform message design, with scholars suggesting that representing health risks at lower construal levels can help bridge gaps in psychological distance and encourage audience members to think about a particular health threat at a lower construal level (Chandran & Menon, 2004). Low construal

messages in health communication research tend to either describe a health threat in more specificity or graphic detail than high construal messages or represent the threat as proximal (versus distant) on one or more dimensions of psychological distance (e.g., using present tense versus future tense when describing a risk to influence perceived temporal distance; Carrera et al., 2014; Borovoi et al., 2017). Approaches to applying CLT to health contexts have also varied. Some interpretations of CLT place answers to "how" questions (e.g., how to prevent a disease) at low construal levels, with "why" questions (e.g., why prevent a disease) being placed at higher construal levels. The findings in this line of research have been mixed, with some finding lower construal messages to be more effective at influencing attitudes and behavioral intentions (e.g., Monestal-Umaña & Schulz, 2015), and others generating similar findings for high construal messages (e.g., Achar et al., 2020; Park et al., 2020). A less common approach to CLT research in health communication has tested the congruence of message construal level and individuals' psychological distance, yielding promising, but not practical results (Kim, 2019; Guan & So, 2020). As such, the present study seeks to add to a growing body of literature that tests the influence of exposure to high and low construal messages on individuals' psychological distance and behavioral intentions pertaining to a specific health threat.

Studies in this line of research have found support for low construal messages as an effective message design strategy for decreasing psychological distance to a health event and thus influencing a range of outcomes, including risk perceptions and behavioral intentions. For example, Qin et al. (2020) found that exposure to low construal messages induced a low construal mindset and less psychological distance towards the consequences of opioid misuse, which in turn resulted in higher risk perceptions. Similarly, Kim and Kim (2018) found that low construal messages about the dangers of smoking reduced psychological distance to these

consequences for participants, resulting in greater intentions to quit smoking. Therefore, in the context of the present study, low construal messages may be effective at reducing young adults' psychological distance to colorectal cancer.

Narratives as Low Construal Messages

CLT suggests that messages that are concrete (low construal messages) can help individuals form more vivid mental representations of future threats, bringing them into the "here and now," thus influencing risk perceptions and potentially prompting individuals to action (Chandran & Menon, 2004; Trope & Liberman, 2010, p. 440). Recent studies have tested the efficacy of health messages designed based on the basic propositions of CLT, finding that low construal messages, or messages that are concrete, are more effective at influencing risk perceptions and behavioral intentions than high construal, or abstract, messages (Kim & Kim, 2018; Qin et al., 2020). Scholars have suggested that narratives in general are inherently low construal messages, given the concrete examples, representations of lived experiences, and specificity they provide, and thus are a promising avenue for CLT research (Kim & Nan, 2016; Lee, 2019). Narratives, therefore, when compared to non-narratives, might be an effective strategy for reducing young adults' psychological distance to colorectal cancer, and potential health threats in general.

Very few studies, however, have examined narratives within the context of CLT; these studies have primarily focused on comparing narrative features by manipulating aspects of narratives via one or more dimension of psychological distance to test their effectiveness (e.g., Ma & Nan, 2018). Studies that compare narratives to non-narratives utilizing CLT as a theoretical framework are even fewer, although their findings support the potential for narratives to induce a reduction in psychological distance and motivate behavioral intentions. Ma and Nan

(2019), for example, found that loss-framed narratives resulted in increased levels of perceived severity of smoking than loss-framed non-narratives. They did not, however, find significant differences between gain-framed narratives and non-narratives (Ma & Nan, 2019). Most relevant to the present study, Kim and Nan (2016) found that low construal (present-oriented) narratives were more effective than non-narratives and future-oriented narratives in terms of influencing behavioral outcomes related to HPV, although the researchers did not measure psychological distance. In accordance with the basic propositions of CLT, namely that exposure to a low construal message reduced psychological distance to a particular event, in turn influencing behavioral intentions (Chandran & Menon, 2004; Trope & Liberman, 2010; Kim & Nan, 2016), it is possible that this result could be explained as an outcome of reduced psychological distance. In the context of the present study, exposure to a narrative would be expected to result in reduced psychological distance to developing colorectal cancer. I, therefore, propose the following hypothesis:

H2: Narrative (vs. nonnarrative) message format of a cancer news article will reduce psychological distance to colorectal cancer.

Colorectal Cancer Risk Perceptions, Perceived Severity, and Behavioral Intentions

When caught early, colorectal cancer has an excellent prognosis, but by the time it is being diagnosed in young adults, it has often metastasized to other organs (Zbuk et al., 2009). Medical experts estimate that young adults experience colorectal cancer symptoms for extended periods of time – several months or even upwards of a year – before seeking treatment, which is resulting in delayed diagnoses (Inra & Syngal, 2015; Levine & Zbuk, 2019). This delay is often attributed to a lack of awareness of colorectal cancer symptoms. Educating young adults about these symptoms, which include rectal bleeding, abdominal pain, and changes in bowel

movements, has been identified as a key step towards earlier diagnoses – and as a result, better prognoses (Zbuk et al., 2009; Deen et al., 2016).

The majority of colorectal cancer incidences in young adults are attributable to behavioral and lifestyle factors, such as poor diet and sedentary lifestyles (Inra & Syngal, 2015), and, therefore, encouraging young adults to adopt healthier behaviors as preventative measures is also an important step towards mitigating the risk of developing colorectal cancer (Deen et al., 2016). For many young adults, however, cancer is not top-of-mind, with many perceiving themselves to be at no or low risk for developing cancer (Johnson et al., 2002; Alaa & Shah, 2019; Osei et al., 2021). Previous research has found that young adults tend to not be engaged in cancer prevention and detection, and in general, show an overall low awareness of cancer symptoms (Kyle et al., 2012; Sarkar et al., 2018; Xu & Odum, 2019). Health communicators are tasked with the challenge of developing messages and interventions that heighten young adults' cancer risk perceptions and motivate them to take steps toward prevention and detection (Jiang & Liu, 2021).

Narratives have long been lauded for their potential to influence behavioral intentions and heighten risk perceptions (Hinyard & Kreuter, 2007; Kreuter et al., 2007; Braddock & Dillard, 2016). As previously described, numerous studies have examined the efficacy of narratives in influencing perceptions and attitudes and motivating behavioral change, finding overwhelming support for this possibility (Kim et al., 2012; Oliver et al., 2012; Murphy et al., 2013; Frank et al., 2015; Collins & Lazard, 2020; Tamul et al., 2021). Personal narratives in the news, specifically, have been demonstrated as an effective strategy for increasing personal risk perceptions, influencing perceived severity of specific health conditions, and inspiring long-term behavioral changes (Chen et al., 2016; Shaffer et al., 2018). Similar findings have been noted

within the context of cancer narrative research, further supporting claims that narratives are effective tools for producing these key outcomes of interest (Murphy et al., 2013; Dillard et al., 2018; Klein et al., 2020). Many of these studies have found message engagement to play an influential role in heightening risk perceptions, influencing perceptions of severity, and motivating behavioral intentions (Kim et al., 2012; Oliver et al., 2012; Tamul et al., 2021). In light of these findings, I pose the following hypotheses:

H3: Narrative (vs. nonnarrative) message format of a cancer news article will produce higher colorectal cancer a) risk perceptions, b) perceived severity, and c) prevention/detection behavioral intentions.

H4: The relationship between message format and colorectal cancer a) risk perceptions, b) perceived severity, and c) prevention/detection behavioral intentions will be mediated by message engagement.

CLT may also provide an explanation for the efficacy of narratives in increasing risk perceptions and motivating behavioral change, as when psychological distance is reduced, a threat feels more immediate (Chandran & Menon, 2004; Trope & Liberman, 2010). Threats that are more concrete, via any or all dimensions of psychological distance, are perceived to be more severe and require more immediate attention than threats that are perceived to be distant, thus prompting individuals to take action (Chandran & Menon, 2004; Trope & Liberman, 2010; Carmi & Kimhi, 2015; Detweiler-Bedell & Detweiler-Bedell, 2016; Lee, 2019). In that case, decreasing psychological distance to a threat would result in increased risk perceptions and, in turn, increased behavioral intentions. The extant literature on CLT supports this possibility, with studies finding exposure to low construal messages to be effective at increasing risk perceptions (Lermer et al., 2016), perceived severity (Cami & Kimhi, 2015), and intentions to adopt healthier

behaviors (Ahn, 2015; Kim & Nan, 2016). Notably, Kim and Nan (2016) found that present-oriented narratives, when compared to non-narratives and future-oriented narratives, were more effective at increasing behavioral intentions to vaccinate against HPV. Given the demonstrated efficacy of narratives and low construal messages in increasing risk perceptions, perceived severity, and behavioral intentions, I pose the following hypothesis:

H5: The relationship between message format and colorectal cancer a) risk perceptions, b) perceived severity, and c) prevention/detection behavioral intentions will be mediated by psychological distance.

Merging Construal Level Theory and Message Engagement

The four dimensions of psychological distance (temporal, social, spatial and hypothetical) offer a potential explanation for how health risks are assessed and perceived by individuals. The temporal dimension of psychological distance relates to perceptions of time, in that events that are perceived to happen in the distant future are more abstract and psychologically distant than near-future events. Spatial distance refers to the physical distance between an individual and an event (Trope & Liberman, 2010). This dimension is most frequently examined in climate change research (e.g., Chu & Yang, 2018), although it may be relevant to certain health risks (e.g., skin cancer). Social distance involves individuals' perceptions of the people who are most at risk for experiencing a particular event (Trope & Liberman, 2010). An event is typically mentally construed as psychologically distant if an individual perceives it to impact those who are dissimilar from them (Trope & Liberman, 2010). In the context of colorectal cancer, it is possible that young adults perceive the elderly or older adults to be at a higher risk, and thus perceive it to be socially distant. The hypothetical dimension refers to perceptions of the extent to which an event is likely to happen (Trope & Liberman, 2010). This dimension of psychological distance,

too, may be relevant in the context of colorectal cancer, given that young adults tend to have an optimistic outlook on their own cancer risks (Wong, 2009).

It is likely that colorectal cancer is psychologically distant for young adults in terms of the social, temporal, and hypothetical dimensions outlined by CLT. Narratives have been proposed as a potentially effective intervention for reducing psychological distance to health threats (Kim & Nan, 2016). The two key components of message engagement in the news make this a promising possibility: transportation and identification. In the context of cancer narratives, identification may help reduce psychological distance on the social dimension by introducing members of an audience to someone who shares similarities with them and has experienced cancer. Trope and Liberman (2010) note that psychological distance to a particular event is likely decreased if one has experienced that event themselves or if someone they know has. In that case, through identification, a personal narrative could serve as a proxy for real-world interactions.

Transportation may reduce psychological distance via the temporal and hypothetical dimensions by making a threat feel both more immediate and more probable. Experiencing an event in real life is believed to result in less psychological distance to that event (Trope & Liberman, 2010). As Green and Brock (2000) assert, transportation allows audience members to experience a narrative as if its events are occurring in real life and in real time. As such, transportation, too, could allow cancer narratives to serve as a proxy for real world experiences with cancer. If a young adult perceives colorectal cancer to be future threat, transportation may allow them to experience the events in the narrative as if they are happening in the present, increasing the perceived immediacy of the threat of developing cancer. Similarly, if one

perceives developing colorectal cancer as unlikely or improbable, becoming absorbed in a cancer narrative may make the possibility of developing cancer more concrete.

While much of the extant research on CLT has only focused on manipulating one dimension of psychological distance (Kim & Nan, 2016; Ma & Nan, 2018; Ma & Nan, 2019), through the abovementioned aspects of message engagement, narratives may be able to influence perceived distance on up to three dimensions. To form a basis for examining the potential relationships between identification, transportation, and the dimensions of psychological distance in future studies, I seek to first test, in general, how narrative engagement may influence psychological distance, posing the following hypothesis:

H6: The relationship between narratives and psychological distance will be mediated by message engagement.

Images and Construal Level

Health messages are often accompanied by visual components (e.g., imagery, graphs, charts), which have been linked to various outcomes, including attention, recall, comprehension, risk perceptions, and behavioral intentions (King, 2015; King & Lazard, 2020). A content analysis of cancer-related information materials found that images of people, and to a lesser extent, symbols and images of objects, were commonly featured alongside information and data about cancer (King, 2015). Within the context of cancer, however, more research is needed to understand the influence of such imagery on key outcomes of interest in order to inform best practices (King, 2015). The present study seeks to fill this gap by examining imagery accompanying cancer news articles within the CLT framework.

CLT posits that images are less abstract than words (Trope & Liberman, 2010), with studies showing that images require lower levels of mental abstraction (Amit et al., 2009). CLT

research, however, has primarily focused on text-based messages, rather than images (Duan et al., 2021). The limited research in this area has more often tested the effects of the presence (compared to the absence) of images; for example, in the context of health communication, Qin et al. (2020) found that the presence of images decreased psychological distance to opioid misuse. The few studies that have examined image content within the framework of CLT have done so in the context of climate change (e.g., Duan et al., 2021) and marketing (e.g., Lee et al., 2017). These studies have manipulated aspects of images to test low construal and high construal images via the spatial, social, or temporal dimensions of psychological distance in order to influence attitudes and behavioral outcomes. Their findings have, thus far, provided support for the idea that images can be utilized to influence perceptions of psychological distance (Lee et al., 2017; Duan et al., 2021). In the context of climate change, Duan et al. (2021) found that images that were more concrete (i.e., highlighting the present effects of climate change on humans) reduced psychological distance and induced more climate change concern than images that were abstract (i.e., depicted future effects of climate change on animals). Although these findings are promising, more research is needed to understand how images and image content may influence psychological distance.

The present study seeks to address this gap in the literature by manipulating image content within the context of cancer communication. Cancer narratives in the news media are sometimes accompanied by an image of the person in which the narrative is about, while sometimes, presumably to protect that individual's privacy, images of health or medical-related objects are used instead. An image of a person may influence psychological distance via the social dimension, which thus may enhance the effects of a narrative on psychological distance. Conversely, the content of the image may not make a difference if all images, in general,

regardless of content, are perceived as equally low construal messages. The researcher, therefore, poses the following research questions:

RQ1: Does the presence of an image of a young person (compared to an image of an object) reduce psychological distance to the threat of colorectal cancer?

Examining Potential Moderating Variables

Acknowledging that perceptions surrounding psychological distance and construal level are specific to an individual, Trope and Liberman (2010) note that individual differences may play a role in how events are mentally construed and the impact of construal level on psychological distance. The present study seeks to investigate two potential moderating variables on the relationship between psychological distance and behavioral intentions: cancer worry and cyberchondria. Cancer worry, or "an emotional reaction to the threat of cancer" (Hay et al., 2005, p. 517), was identified as a potential moderator between psychological distance and outcome variables in a previous study about CLT and health information, although that relationship was not assessed (Simonovic & Taber, 2021). Cancer worry has been examined as both a potential facilitator and a potential barrier to engaging in prevention and detection behaviors, with numerous studies finding that cancer worry motivates individuals to take action to mitigate the risk of developing cancer (e.g., Hay et al., 2006; Zhang et al., 2012; Kiviniemi & Ellis, 2014; Zhao & Nan, 2016). It is possible that individuals who are high in cancer worry will be more motivated to take steps toward preventing and detecting cancer than individuals who are low in cancer worry after exposure to a more concrete (low construal) message. The immediateness of the threat of developing cancer, prompted by lower construals and decreased psychological distance, may have an even more substantial impact on individuals who are high in cancer worry.

Similarly, individuals who are high in cyberchondria, or excessive online information seeking pertaining to health risks, may experience more psychological distress when reading about cancer risks (Starcevic & Berle, 2013). While cyberchondria is a relatively new phenomenon, unique to the digital age (Starcevic & Berle, 2013), a growing body of research has linked it to behavioral changes in the real world (e.g., Mathes et al., 2018; Jokic-Begic et al., 2020). The underlying fear of developing serious health conditions makes individuals more susceptible to persuasive messages, as they are already motivated to take preventative action against health threats (Starcevic & Berle, 2013). It is possible, therefore, that cyberchondriacs may have a stronger reaction toward concrete health information, prompting them to adhere to recommended behaviors, when compared to those who do not suffer from cyberchondria. The researcher, therefore, poses the following hypothesis:

H7: The relationship between psychological distance and behavioral intentions is moderated by a) dispositional cancer worry and b) cyberchondria.

The proposed relationships between all variables are represented in Figure 1.

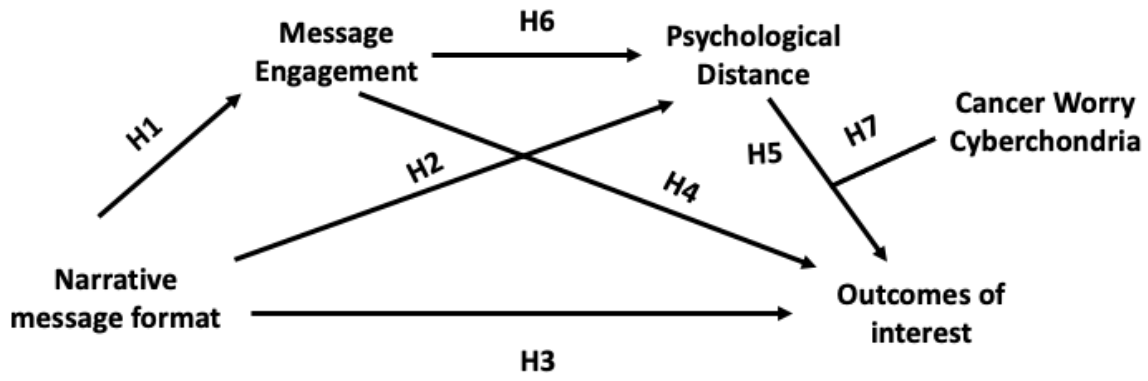

Figure 1

Proposed conceptual model

CHAPTER 3

METHODS

In this chapter, the methods for testing the proposed conceptual model are detailed. All procedures, analyses, and measures are described. A description of the study stimuli and sample are also included in this chapter.

Study Protocol

Participants were presented with a manipulated news article in a 2 (narrative vs. non-narrative) x 2 (image of person vs. image of object) factorial design. Randomization was used to assign participants to one of the four conditions.

After providing informed consent, participants were first asked to provide basic sociodemographic information and respond to several measures related to the individual difference variables of interest. They were then asked to read a news article. After reading the article, they were asked to respond to a manipulation check question, which asked them to report whether the news article they read featured a personal cancer narrative (Kim & Nan, 2016). Lastly, they were presented with a series of questions that pertain to their response to the article as well as the outcome variables of interest. Upon completion of the survey, participants were notified that the news article they read had been manipulated. This study was approved by the University of Georgia IRB.

Study Sample

Young adults were recruited using the research pool of the Department of Communication Studies at the University of Georgia. An *a priori* power analysis was conducted

using G*power (Faul et al., 2009). The anticipated effect size (r=.13) was determined based on the average effect size reported in a meta-analysis of narrative health communication research (Shen & Han, 2014). Power analysis indicated a sample size of at least 624 would be needed for a two-way ANOVA to detect effects as small as r=.13 with power at .90 (Cohen, 1992).

The final sample (N=709) were predominantly non-Hispanic white (79.0%) and female (65.9%). Sample characteristics are reported in Table 1.

Stimulus Development

Real news stories about colorectal cancer in young adults were modified for the purposes of this study. One article featured a personal narrative from a young colorectal cancer patient, while the other solely focused on health information about colorectal cancer risks and prevention. The articles contained similar information about colorectal symptoms and prevention and were almost exactly identical in length (narrative = 616 words; non-narrative = 621 words). Both were articles featured on the *Today Show* website, but the source was modified to reflect a news source that young adults may be more familiar with (*Buzzfeed*).

The image content of the articles was modified from the original versions, replacing the existing images with stock photos. The articles were modified to include a stock image of a young adult for the image of person condition and an image of a blue ribbon (a symbol for colorectal cancer) for the image of object condition. Stimuli are available to view by request.

Measures

Scale items for all measures are reported in Appendix B.

Demographics. Participants were asked to report their age, gender, race, ethnicity, political affiliation, and political ideology.

Psychological distance. Participants were asked to report their level of agreement on a 5-point scale (1=Strongly disagree; 5=Strongly agree) with 10 items that represent the three dimensions of psychological distance of interest in this study (hypothetical, temporal, and social). This scale gauges participants' perceptions about the extent to which an event is likely to happen to them or people like them at different points in time (e.g., "Colorectal cancer is experienced by people like me"). Scores were reversed so that a lower score would indicate lower psychological distance. A standard measure for psychological distance does not yet exist. Therefore, items were adapted for the context of colorectal cancer from Jones et al. (2017), Spence et al. (2012), and Wang et al. (2019). Four reverse-worded items were removed to improve the reliability of this scale, resulting in a final 6-item scale used for analyses (M = 2.55, SD = .63; α = .72). Results from an exploratory factor analysis (reported in Appendix C) indicated a single factor structure for the measure.

Message engagement. Two dimensions of message engagement were measured: transportation and identification. Prior studies have measured message engagement for both narratives and non-narratives (e.g., Oliver et al., 2012; Oschatz et al., 2019), and as such this study adopts a similar approach, measuring transportation and identification for both message formats. Transportation was measured using an 11-item scale adapted for news articles from Green and Brock (2000). Item wording was adapted to apply to both narrative and nonnarrative message format. Participants were asked to report their level of agreement with statements pertaining to their experiences reading the news article (e.g., "I was mentally involved in the article while reading it"). Eight items representing identification were adapted for the context of colorectal cancer and asked participants to report their level of agreement with statements about relating to a young adult colorectal cancer patient (e.g., "While I was reading the article, I put

myself in the position of young adults with colorectal cancer"; de Graaf et al., 2012). All message engagement (i.e., transportation and identification) items were measured on 5-point scales (1=Strongly disagree; 5=Strongly agree). Both scales were reliable (Transportation: M = 2.98, SD = .57; α = .73; Identification: M = 3.41, SD = .77; α = .86). When combined to form the message engagement measure, the resulting scale was also reliable (M = 3.16, SD = .58; α = .86).

Risk Perceptions. Three items (Landau et al., 2019) were used to assess colorectal cancer risk perceptions. Measured on a 7-point scale (1 = Almost Zero; 7 = Almost Certain), this measure asked participants to assess their perceived chances of developing colorectal cancer (e.g., "I think my chances of developing colorectal cancer sometime in the future is…"; M = 2.83, SD = .86; α = .72).

Perceived Severity. Four items (Janssen et al., 2010) were adapted for the context of colorectal cancer; these questions ask participants to report their level of agreement with statements about the seriousness of developing colorectal cancer (e.g., If I developed colorectal cancer, I would get seriously ill"). A reverse worded item was removed to improve reliability. Responses were reported on a 5-point scale (1 = Strongly Disagree; 5 = Strongly Agree; M = 3.95, SD = .61; α = .60).

Behavioral Intentions. Items from Cho et al. (2018) were adapted for the context of colorectal cancer. This 5-item scale measures participants' intentions to engage in key prevention and detection behaviors (e.g., monitoring oneself for symptoms, taking steps to maintain a healthy lifestyle), as well as information seeking and sharing behaviors (e.g., "I intend to search for more information about colorectal cancer"; Cho et al., 2018). Responses were reported on 5-point scale (1 = Strongly Disagree, 5 = Strongly Agree; M = 3.30, SD = .850; α = .82).

Cancer Worry. Four items (Dijkstra & Brosschat, 2003) were used to assess cancer worry. These questions asked participants to indicate the extent to which statements describe them on a 5-point scale. These items gauge how much participants dwell on the possibility of developing cancer (e.g., "I feel anxiety when I think about developing cancer"; 1 = Does not describe me, 5 = Describes me extremely well; $M = 2.49$, $SD = 1.08$; $\alpha = .88$).

Cyberchondria. The CSS-12 scale (McElroy et al., 2019) was utilized to measure cyberchondria. This 12-item scale is a short-form scale of the larger cyberchondria severity scale and asks participants to indicate how often they engage in particular behaviors on a 5-point scale (e.g., "I think I am fine until I read about a serious condition online"; 1 = Never, 5 = Always; $M = 2.36$, $SD = .751$; $\alpha = .91$).

Cognitive Testing

I used cognitive testing prior to launching the study to refine the stimuli and survey instrument. Seven young adults were recruited using the Department of Communication Studies research pool and randomly assigned to conditions. Each participant was provided with a printed version of the complete survey, as well as paper and a pen. Participants were encouraged to take notes about their experience taking the survey. Additionally, participants were asked to raise concerns with me or ask for clarification as issues arose. After completing the survey, I asked each participant a series of open-ended questions about the survey and stimuli. I used this feedback to determine an ideal length for the stimuli, as well as refine survey questions that were confusing or difficult to respond to.

Quality Checks

Participants were excluded from analyses if they a) they completed the survey in under one-third median time or b) failed to provide meaningful responses to open-ended questions

related to the topic of the news article. This resulted in a final sample of 709 out of 715 responses collected.

Manipulation Check

Participants were asked to report if the news article they read used a personal narrative. Responses of "yes" were coded as 1, and responses of "no" were coded as 2. There were significant differences between the narrative (M=1.03) and non-narrative (M=1.77) groups, $F($1, 704)=923.85, p<.001. This indicates that the manipulation was successful.

CHAPTER 4

RESULTS

The results of all analyses are reported in this chapter. SPSS version 27 was used to conduct all analyses. Main effects (H1, H2, H3, and RQ1) were tested using two-way ANOVAs. For the message format factor, the non-narrative group was coded as 0 and the narrative group was coded as 1. For the image factor, the group featuring the image of the object was coded as 0 and the group featuring the image of the young person was coded as 1. Results are summarized in Figure 2.

Bivariate Correlations

Zero-order relationships between variables were assessed using bivariate correlations (see Table 2). Low psychological distance was strongly correlated with message engagement, risk perceptions, behavioral intentions, and risk perceptions. Being female was strongly correlated with cancer worry and cyberchondria.

Main Effects

The results of the two-way ANOVAs can be found in Tables 3-4. Consistent with H1, participants in the narrative conditions (M=3.29) experienced greater message engagement than participants in the non-narrative conditions (M=3.04), $F(1, 705)=35.07$, $p<.001$. Message format did not, however, predict psychological distance, thus H2 was not supported. There were no main effects of message format on risk perceptions, perceived severity, or behavioral intentions, so H3 was not supported. Answering RQ1, there was no main effect of image content on psychological distance.

Mediation

Mediation analyses were conducted using the PROCESS macro (Hayes, 2018). Model 4 was used to test psychological distance and message engagement as mediators between message format and each outcome variable (H4-H6). H4 proposed that message engagement would mediate the relationship between message format and a) risk perceptions, b) perceived severity, and c) behavioral intentions. Message engagement mediated the relationship between message format and all three outcomes, such that the narrative conditions resulted in higher message engagement, which led to increased a) risk perceptions, b) perceived severity, and c) behavioral intentions. Thus, H4 was supported.

Psychological distance did not mediate the relationships between message format and a) risk perceptions, b) perceived severity, or c) behavioral intentions. Thus, H5 was not supported. H6 proposed that the relationship between message format and psychological distance would be mediated by message engagement. H6 was supported; the narrative conditions resulted in higher message engagement, which led to decreased psychological distance.

Coefficients for mediation analyses are reported in Table 5.

Moderation

Moderation analyses were conducted using Model 1 of the PROCESS macro (Hayes, 2018). H7 proposed that cyberchondria and cancer worry would moderate the relationship between psychological distance and behavioral intentions. H7 was not supported (Cyberchondria: interaction coefficient = .01, p=.87; Cancer Worry: interaction coefficient=.01, p=.75).

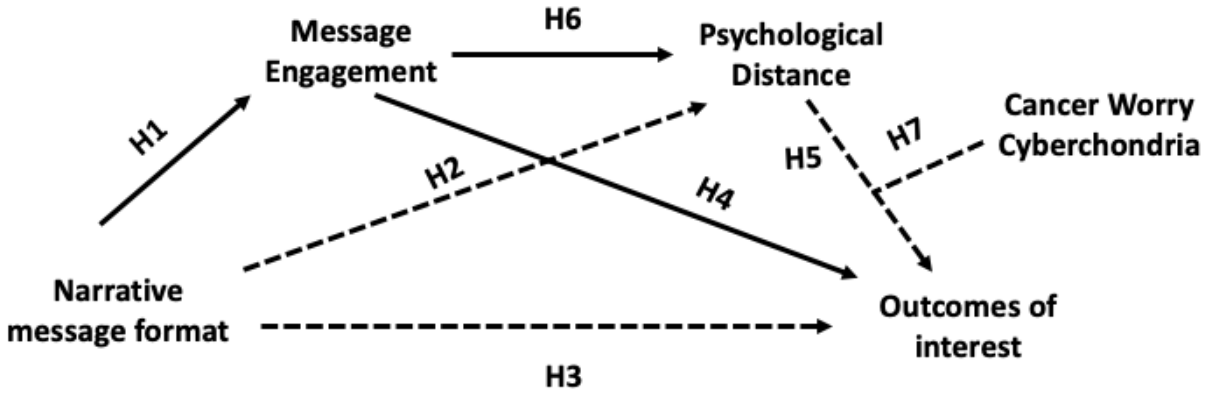

Figure 2

Diagram of results

Note: Solid lines represent statistically significant relationships.

Exploratory Analyses

Given that message engagement mediated the relationships between message format and psychological distance as well as message format and each outcome, further analyses were conducted to examine if the effect of message format on each outcome would be through linked mediators of message engagement and psychological distance. Model 6 (Hayes, 2009) was used to conduct serial mediation analyses with message engagement and psychological distance as mediators between message format and outcomes. The results indicate that the narrative message format results in higher message engagement, which decreases psychological distance and, in turn, results in increased risk perceptions (*b*=.04, *SE*=.01, 95% CI = [.0255, .0665]), behavioral intentions (*b*=.03, *SE*=.01, 95% CI=[.0151, .0470]), and perceived severity (*b*=.03, *SE*=.01, 95% CI=[.0192, .0507]).

In light of the statistically significant correlation between gender and psychological distance, the influence of gender on study outcomes was explored further. There was a

statistically significant difference between male (*M*=2.48) and female (*M*=2.60) participants in terms of psychological distance, (*F*(1, 705)=5.91, *p*=.015). Interestingly, female participants (*M*=3.45) reported higher levels of identification with the individual in the narrative, who was male, than male participants (*M*=3.33), *F*(1, 705)=3.98, *p*=.05. Given these differences, all hypotheses and research questions were retested with gender as a covariate; none of the results differed from the original findings reported above.

Given the significant correlations between cyberchondria and race, ANOVAs were utilized to examine which individuals may be more prone to experiencing cyberchondria. There were statistically significant differences in terms of race and cyberchondria, as participants who identified as African American (*M*=2.67) reported significantly higher levels of cyberchondria compared to their white (*M*=2.32), Asian (*M*=2.40), and American Indian (*M*=2.13) peers, *F*(1, 705=3.93, *p*=.004.

Table 1

Participant Characteristics

	N	%
Sex		
Female	467	65.9
Male	242	34.1
Age		
18	271	38.2
19	214	30.2
20	115	16.2
21	66	9.3
22	34	4.8
23	6	.8
24	2	.3
30	1	.1
Race/Ethnicity*		
Hispanic or Latino	57	8.0
White	560	79.0
Black or African American	45	6.3
Asian, Asian Indian or Pacific Islander	93	13.1
Native American, American Indian or Alaska Native	4	0.6
Different race	7	1.0
Political Affiliation		
Democrat	339	47.8
Republican	370	52.2
Political Viewpoint		
Very liberal	35	4.9
Liberal	150	21.2
Moderate	325	45.8
Conservative	173	24.4
Very conservative	26	3.7

Notes. $N = 709$. *Categories in this section are not mutually exclusive.

Table 2

Bivariate Correlations

	1	2	3	4	5	6	7	8	9	10	11	12
1. Factor: Msg Format	----											
2. Factor: Image	.05	----										
3. Age	.04	.00	----									
4. Gender	-.06	.01	.11**	----								
5. Race	-.09	.01	-.07	.09*	----							
6. Psych. Dist.	-.01	.03	.01	-.09*	.03	----						
7. Msg Engagement	.22**	-.01	-.05	-.04	-.04	-.43**	----					
8. Severity	.05	-.01	.01	.01	-.06	-.35**	.27**	----				
9. Risk Perceptions	-.04	-.05	-.02	.06	.05	-.37**	.33**	.15**	----			
10. Behavioral Intentions	.05	-.06	-.08*	.00	-.02	-.39**	.56**	.20**	.30**	----		
11. Cyberchondria	.00	-.01	.00	-.09*	.10**	-.12**	.24**	.15**	.28**	.25**	----	
12. Cancer Worry	-.02	-.05	.00	-.14**	.02	-.24**	.28**	.19**	.36**	.23**	.50**	----

Notes: $N = 709$. Message format factor is coded as 0 = Nonnarrative, 1 = Narrative; Image content factor is coded as 0 = Object, 1 = Person. Gender is coded as 1=Female, 2=Male. Race is coded as 1=White, 2=Non-white.
†$p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$

Table 3

Main Effects of Message Format

Group (by factor):	*Nonnarrative (N = 372)*	*Narrative (N = 337)*	*Between-participants Effects*
Message Engagement	3.04 (.29)	3.29 (.31)	$F(1, 705) = 3.51$, $p < .001$
Psychological Distance	2.56 (.03)	2.55 (.03)	$F(1, 705) = .07$, $p = .80$
Risk Perceptions	2.86 (.05)	2.80 (.05)	$F(1, 705) = .89$, $p = .35$
Perceived Severity	3.92 (.03)	3.99 (.03)	$F(1, 705) = 2.17$, $p = .14$
Behavioral Intentions	3.26 (.04)	3.35 (.05)	$F(1, 705) = .89$, $p = .35$

Notes: Means (*SD*s in parentheses) and results of two-way ANOVAs.

Table 4

Main Effects of Image Content

Group (by factor):	*Object (N = 346)*	*Person (N = 363)*	*Between-participants Effects*
Message Engagement	3.18 (.03)	3.15 (.03)	$F(1, 705) = .34$, $p=.56$
Psychological Distance	2.54 (.03)	2.57 (.03)	$F(1, 705) = .59$, $p = .44$
Risk Perceptions	2.88 (.05)	2.79 (.05)	$F(1, 705) = .1.98$, $p = .16$
Perceived Severity	3.96 (.03)	3.94 (.03)	$F(1, 705) = .17$, $p = .68$
Behavioral Intentions	2.89 (.05)	2.79 (.05)	$F(1, 705) = 1.98$, $p = .16$

Notes: Means (*SD*s in parentheses) and results of two-way ANOVAs.

Table 5

Mediation Analyses

		Indirect Effect of X on Y		Model Paths			
DV	Mediator	*b* (*SE*)	95% CI	*a* path	*b* path	*c* path	*c'* path
Risk Perceptions	Message Engagement	.13 (.03)	***.0840, .1855***	.25 (.04)***	.53 (.05)***	-.07 (.06)	-.20 (.06)*
Perceived Severity		.07 (.02)	***.0414, .1027***	.25(.04)***	.28 (.04)***	.06 (.05)	-.01 (.05)
Behavioral Intentions		.21 (.04)	***.1408, .2873***	.25 (.04)***	.85 (.05)***	.08 (.06)	-.13 (.05)*
Psychological Distance		-.12 (.02)	***-.1672, -.0788***	.25 (.04)***	-.49 (.04)***	-.01 (.05)	.11 (.04)*
Risk Perceptions	Psychological Distance	.01 (.02)	*-.0423, .0529*	-.01 (.03)	-.50 (.05)***	–.07 (.06)	-.07 (.06)
Perceived Severity		.00 (.02)	*-.0275, .0360*	-.01 (.05)	–.33 (.03)***	.06 (.05)	.06 (.04)
Behavioral Intentions		.01 (.03)	*-.0463, .0566*	-.01 (.05)	-.53 (.05)***	.08 (.06)	.08 (.06)

Notes. The table reports results of mediation analyses using PROCESS Model 4 (Hayes, 2018). Indirect effects of message format on outcomes via message engagement and psychological distance are reported. Indirect effects in which the confidence intervals do not contain 0 are considered statistically significant and are highlighted in bold. Coefficients and standard errors for each model path are represented in the last four column (*a* = path from IV to mediator, *b* = path from mediator to DV, *c* = total effect, *c'* = direct effect). *$p < .01$ **$p < .001$ ***$p < .0001$

CHAPTER 5

DISCUSSION

Despite their prevalence (Macdonald et al., 2018), cancer narratives in the news, and especially those featuring non-celebrities, are understudied. With colorectal cancer rates rising in young adults, examining the utility of such narratives as a tool for prompting young adults to adopt key prevention and detection behaviors is pertinent. Although scholars have proposed narratives and images as promising means for reducing psychological distance to health threats, very few studies have tested this (Kim & Nan, 2016; Qin et al., 2020). This study, therefore, sought to fill critical gaps in knowledge about cancer narratives in the news, as well as advance CLT scholarship. To address these gaps, this study used a survey experiment that compared the effects of narratives and non-narratives in the news media about colorectal cancer in young adults on psychological distance, message engagement, and key outcomes of interest, while also examining two potential moderators.

The Impact of Cancer Narratives in the News

This study examined whether cancer news articles featuring a narrative resulted in higher message engagement for young adults than a non-narrative news article. Indeed, there was a main effect of message format on message engagement, in that the narratives elicited significantly higher message engagement. This finding is in-line with a wealth of previous scholarship that has demonstrated that audiences experience message engagement more so with narrative messages than non-narrative messages (e.g., Kim et al., 2012; Oliver et al., 2012; Tamul et al., 2021). Narratives have long been lauded for their ability to heighten risk

perceptions and prompt behavioral change (Hinyard & Kreuter, 2007; Kreuter et al., 2007; Braddock & Dillard, 2016, Perrier & Ginis, 2018). Contrary to expectations, however, there were no significant differences between message format conditions and the key outcomes of interest in this study (risk perceptions, perceived severity, and behavioral intentions). In testing H4, however, message engagement successfully mediated the relationship between message format and all three outcomes of interest. Much of the success of narratives has been chalked up to message engagement (Kim et al., 2012; Oliver et al., 2012; Tamul et al., 2021), and, therefore, this study adds further evidence for the important role of message engagement in influencing key outcomes.

In addition to providing support for the basic tenets of narrative theory, these findings also yield practical implications for journalists. Cancer narratives in the news can be a useful tool for heightening risk perceptions and increasing behavioral intentions. Narrative news articles, due to increased message engagement, therefore, are favorable to non-narrative news articles, and as such, present a major opportunity to raise awareness for critical health issues, like colorectal cancer. In the context of colorectal cancer, in particular, the results of this study demonstrate that narratives can be a powerful tool for prompting young adults to engage in prevention and detection behaviors. Therefore, journalists, health communicators, and clinicians should look to providing information about colorectal cancer in narrative formats in order to engage this particular audience.

Construal Level Theory and Cancer Narratives

A primary goal of this study was to examine cancer narratives through the construal level theory framework. Scholars have suggested that narratives may result in reduced psychological distance to health threats (Kim & Nan, 2016), and the results of the present study provide support

for this possibility. Although message format alone did not predict psychological distance, through message engagement, the narrative message format did result in lower psychological distance to colorectal cancer. This is an important contribution of this study to our understanding of the factors that can influence the impact of a message on psychological distance. This supports the possibility that the key components of message engagement, identification and transportation, can help bridge gaps in psychological distance via the social, temporal, and hypothetical dimensions. While more empirical work is needed to probe the potential underlying relationships between these constructs, this study helps form a basis for future construal level theory research on narratives.

Given that message format alone did not predict psychological distance, more research is also needed to examine the relationship between narratives and construal level. While scholars have proposed that narratives are inherently low construal messages (Kim & Nan, 2016), the findings of this study did not support this possibility. A possible explanation for this is that this was the first time that this particular audience was learning about colorectal cancer as a health risk for young adults and that reading one brief narrative news article, regardless of format, was simply not enough to reduce psychological distance. It is also possible that because this information is so new to this audience that their psychological distance was reduced regardless of message format. Construal level theory is still a relatively new framework and very little is understood about how psychological distance functions. For example, little is known about how sensitive or fragile psychological distance is, and to my knowledge, studies have yet to use repeated exposure or longitudinal designs in CLT research. These are key areas for future research to explore.

This study also highlighted some of the measurement challenges that accompany CLT research. Psychological distance is a defining variable in this framework, yet a standard measure for it does not exist, and in fact, many studies neglect measuring it altogether. This study made an important contribution in attempting to put together a measure for psychological distance, but as the conflicting results from the exploratory factor analyses reveal, it is essential that a standard, validated measure for psychological distance is developed to support CLT scholarship.

Construal Level Theory and Image Content

This study also sought to further our understanding of images within the CLT framework. CLT posits that images are low construal messages (Trope & Liberman, 2010), yet few studies have compared image content to determine its impact on psychological distance. This study did not find that an image of a young person resulted in less psychological distance to colorectal cancer than an image of an object. Given that *all* images are construed at low levels (Trope & Liberman, 2010), it is possible that the content of the image makes little difference on psychological distance and that is why significant differences were not seen between conditions. Another possible explanation is that the image was easily "lost" within news article format, limiting the effects that it could have on psychological distance. The image was placed at the beginning of the article and was not a prominent feature of the message, compared to the text. A PSA or other formats in which images are more prominently featured may be better suited to examine image content within this framework.

Cancer Worry and Cyberchondria

Trope and Liberman (2010) advocate for the exploration of individual difference variables in CLT research. This study examined cancer worry and cyberchondria as potential moderators between psychological distance and behavioral intentions, finding neither to be a

statistically significant moderating variable. Post-hoc analyses probed these variables as potential moderators between message format and the key outcomes of interest in this study, as well as message engagement, also finding them not to be statistically significant. There were, however, statistically significant correlations between these variables and the outcomes of interest, indicating that their influence operates independently of message format, the related effects of message format, and psychological distance. Individuals who are high in cyberchondria and/or cancer worry, therefore, may experience heightened risk perceptions and perceived severity, as well as increased behavioral intentions, when exposed to cancer-related information, regardless of the format in which it is presented in or their psychological distance to the health risk.

This study also shed light on the young adults who might be prone to experiencing cancer worry and cyberchondria. Future research can test interventions tailored to individuals who experience cancer worry and/or cyberchondria, although researchers should consider the potential negative impact that exposure to concerning health information (e.g., cancer news articles) could have on these individuals.

Limitations

This study was not without limitations. Firstly, although the news plays a critical role in the dissemination of cancer-related information (Macdonald et al., 2018) and many young adults utilize traditional news outlets as a source of information in general (Antunovic et al., 2018), it is possible that they may gravitate more towards other more popular forms of media. As such, the news articles in this study may not have resonated with this audience as much as perhaps TikTok videos or other forms of social media posts. Future studies can examine cancer narratives and non-narratives through other mediums and from other sources that may resonate more with this audience.

Additionally, the narrative used in this study features a male cancer patient. Given that the majority of participants in this study identified as female (65.9%), it is possible that the gender of the individual in the news article influenced the outcomes of this study. According to CLT, the social dimension of psychological distance involves individuals' perceptions of whether an event could happen to or impact others who are similar to them (Trope & Liberman, 2010). A narrative from an individual of the same gender may be more salient to participants. Future studies should consider matching the gender of the individual in the narrative with each audience members' gender to explore this further. Notably, the sample used in this study was relatively homogenous. Future studies should seek to utilize a more diverse and representative sample.

Additional Future Directions

The results of this study will inform an eye-tracking study, which will examine the aspects of cancer narrative news articles audience members fixate on the most. It is possible that the health information provided in the article becomes more salient, and thus receives more attention, when a narrative is included, but it is also possible that aspects of the personal narrative distract audience members from the informative aspects of the article. An eye tracking study can help clarify this, in order to both shed light on the results of this study as well as provide practical guidance for journalists and health communicators about cancer news article content. Future studies can further probe the proposed relationships between identification, transportation, and the dimensions of psychological distance. Additionally, subsequent studies can also compare the effects of different types of cancer narratives in the news, such as celebrity narratives compared to non-celebrity narratives and death versus survival narratives, to

determine the specific features of narratives that will be most effective in reducing psychological distance and influencing key outcomes.

Conclusion

Colorectal cancer is a pressing health concern facing the young adult population. The findings of this study shed light on narratives as effective strategies for motivating young adults to engage in colorectal cancer prevention and detection, while also filling critical gaps in the knowledge related to cancer narratives in the news. This study adds to our current understanding of the efficacy of cancer narratives in the news by examining news articles featuring non-celebrity cancer patients. Furthermore, this study also addresses gaps in the CLT literature, particularly through the examination of narratives and image content. The findings of this study have both theoretical and practical implications. By merging the key components of message engagement with the dimensions of psychological distance outlined by CLT, our understanding of these theoretical frameworks and strategies for effective message design for this particular cancer context are furthered, illuminating new and promising areas of inquiry.

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APPENDIX A: MEASURES

Psychological Distance

Instructions: Please indicate the extent to which you agree or disagree with the following statements.

(1 = Strongly Disagree; 2 = Disagree; 3 = Neither Agree nor Disagree; 4 = Somewhat Agree; 5 = Strongly Agree)

1. Colorectal cancer is experienced by people like me.

2. Colorectal cancer is likely to have an impact on people like me.

3. Colorectal cancer is harming people all over the world right now.

4. Colorectal cancer is an immediate threat impacting people right now.

5. It is pertinent that researchers focus on finding a cure for colorectal cancer.

6. Other people are more likely to experience colorectal cancer than I am. (R)

7. Other people should be worried about developing colorectal cancer. (R)

8. Colorectal cancer is something I should be worried about now.

9. Colorectal cancer is something I should be worried about in the future. (R)

10. It is unlikely that I will develop colorectal cancer. (R)

Message Engagement

Instructions: Please indicate your level of agreement with the following statements.

(1 = Strongly Disagree; 2 = Disagree; 3 = Neither Agree nor Disagree; 4 = Somewhat Agree; 5 = Strongly Agree)

Transportation

1. While I was reading the news article, I could easily picture the events in it taking place.
2. While I was reading the news article, activity going on in the room around me was on my mind. (R)
3. I could picture myself in the scene of the events described in the news article.
4. I was mentally involved in the news article while I was reading it.
5. After reading the news article, I found it easy to put it out of my mind. (R)
6. The news article affected me emotionally.
7. I found my mind wandering while I was reading the news article. (R)
8. The evens in the news article are relevant to my everyday life.
9. The events in the news article changed my life.
10. I found myself thinking of the ways the news article could have turned out differently.
11. I wanted to learn how the events described in the news article ended.

Identification

1. While reading the news article, I thought about what it would be like to be a young adult diagnosed with colorectal cancer.
2. While I was reading the news article, I felt like I was going through what a young adult colorectal cancer patient was going through.

3. While I was reading the article, I put myself in the position of young adults with colorectal cancer.
4. After reading the article, I feel for young adult colorectal cancer patients.
5. While I was reading the article, I empathized with young adult colorectal cancer patients.
6. While I was reading the article, I pictured what it would be like for a young adult to experience colorectal cancer.
7. While I was reading, in my imagination, it was as if I was a young adult experiencing colorectal cancer.
8. While I was reading the article, after a while, it seemed as if I had become the young adults described in the article in my thoughts.

Risk Perceptions

Instructions: Please indicate your perceptions about the likelihood of the below events occurring to you.

(1 = Almost Zero, 2 = Very Small, 3 = Small, 4 = Moderate, 5 = Large, 6 = Very Large, 7 = Almost Certain)

1. I think my chance of getting colorectal cancer sometime in the future is…

2. If I don't take precautions (e.g., eating healthy, exercising regularly), I think my chance of getting colorectal cancer at some point in my life is…

3. If I take care of my health, I think my chance of getting colorectal cancer at some point in my life is…

Perceived Severity

Instructions: Please indicate your level of agreement with the following statements.

(1 = Strongly Disagree; 2 = Disagree; 3 = Neither Agree nor Disagree; 4 = Somewhat Agree; 5 = Strongly Agree)

1. If I get colorectal cancer, it would have little effect on my life. (R)

2. Colorectal cancer is more serious than other diseases I know about.

3. If someone got colorectal cancer, they could die from it.

4. If I got colorectal cancer, I would get seriously ill.

Behavioral Intentions

Instructions: After reading this news article, I intend to…

(1 = Strongly Disagree; 2 = Disagree; 3 = Neither Agree nor Disagree; 4 = Somewhat Agree; 5 = Strongly Agree)

1. Research more information about colorectal cancer.

2. Talk to my friends/family about colorectal cancer.

3. Take actions, like eating healthy and exercising, to prevent colorectal cancer.

4. Monitor myself for colorectal cancer symptoms.

5. Talk to my doctor if I experience colorectal cancer symptoms.

Cancer Worry

Instructions: Please indicate how well these statements describe you.

(1 = Does not describe me, 2 = Describes me slightly well, 3 = Describes me moderately well, 4 = Describes me well, 5 = Describes me extremely well)

1. I am afraid of developing cancer.

2. I worry about having cancer.

3. I feel anxiety when I think about developing cancer.

4. I dwell about potentially developing cancer.

Cyberchondria

Instructions: Please read the following statements and indicate how they typically apply. Please note that this questionnaire relates to perceived medical conditions (i.e., conditions you think you might have) rather than conditions that have been diagnosed by a medical profession.

(1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Often, 5 = Always)

1. If I notice an unexplained bodily sensation, I will search for it on the internet.

2. I read different web pages about the same perceived condition.

3. I enter the same symptoms into a web search on more than one occasion.

4. I start to panic when I read online that a symptom I have is found in a rare/serious condition.

5. I think I am fine until I read about a serious condition online.

6. I feel more anxious or distressed after researching symptoms or perceived medical conditions online.

7. Researching symptoms or perceived medical conditions online leads me to consult with my doctor.

8. I suggest to my doctor that I may need a diagnostic procedure that I read about online (e.g., a biopsy/a specific blood test).

9. Researching symptoms or perceived medical conditions online leads me to consult with other medical specialists (e.g., consultants).

10. Researching symptoms or perceived medical conditions online distracts me from reading.

11. Researching symptoms or perceived medical conditions online interrupts my work (e.g., writing emails, working on word documents or spreadsheets).

12. Researching symptoms or perceived medical conditions online interrupts my offline social activities (e.g., reduces time spent with friends/family).

APPENDIX B: EXPLORATORY FACTOR ANALYSIS: PSYCHOLOGICAL DISTANCE MEASURE

Given that an established scale for psychological distance has yet to be developed, an *a priori* exploratory factor analysis (EFA) was conducted to examine the suitability of this measure. Data from a separate pilot test was used to conduct the EFA (*N*=877). The principal axis factoring (PAF) method and direct oblimin rotation were used to perform the EFA. Prior to conducting the analysis, the data was examined for violations of statistical assumptions. Data does not violate statistical assumptions if Bartlett's test is significant and KMO is greater than .80 (Howard, 2016). The results of these tests indicate that the data was not in violation of statistical assumptions (KMO=.88, Bartlett's test: χ^2= 3473.59, p<.001). Decisions about factor retention were determined by following the Kaiser criterion (having eigenvalues greater in value than 1). Items were assessed by examining if they loaded onto more than one factor greater than .30. All items loaded onto a single factor, with acceptable loadings between .63 and .77 (acceptable loadings are a minimum of .40; Howard, 2016). Using these criteria, the scale was determined to be acceptable to exhibit a single factor structure and was thus utilized for the present study.

The same analyses were conducted with the data from the current study, yielding different results, however. Items loaded on three factors in that case, potentially representing the three dimensions of psychological distance the scale is to represent. These conflicting results underscore the importance of creating a standard scale for psychological distance.