TELLING STORIES FOR CERVICAL CANCER PREVENTION:

THE IMPACT OF NARRATIVE FEATURES AND

PROCESSES ON YOUNG WOMEN'S

HPV VACCINATION INTENTIONS

by

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ABSTRACT

Narrative persuasion research has identified two promising features that could

influence behavior: (a) whether the character lives or dies (narrative outcomes) and (b)

whether the character overcomes key barriers (narrative barriers). The current study

manipulated both narrative features in a human papillomavirus (HPV) vaccine

intervention – delivered via an online panel study – targeted to young adult women aged

18 to 26 ($N = 246$). Participants were randomly assigned to a 2 (survival vs. death) $\times$ 2

(social vs. structural barriers) between subjects experiment. Compared to death

narratives, survival narratives increased narrative plausibility, consistency, and coverage,

and yielded greater HPV vaccination self-efficacy and lower perceived barriers to action.

Narrative features interacted, such that survival narratives featuring social barriers led to

greater transportation into the story than other combinations. Moderated mediation

analysis was employed to test 10 theoretically-derived mediators, including

transportation, four factors of believability, perceived barriers, perceived benefits, risk

susceptibility, risk severity, and self-efficacy. Two variables emerged as mediators of the

narrative message–behavioral intention relationship: transportation and risk

susceptibility. The results provide an important first step toward building a more

comprehensive and integrated model of narrative persuasion processing. These findings

also have practical applications for guiding narrative public health message design in

cervical cancer prevention campaigns. Results also highlight the clinically significant

impact that narrative-based interventions can serve toward lessening the incidence of

cervical cancer through an increase in HPV vaccination for young women. Directions for

future work in the development of narrative persuasion and cancer communication are

discussed.

For Adam

"Knowledge is largely constructed of stories."

– Schank & Berman, 2002, p. 294

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CHAPTER ONE

INTRODUCTION

Historically, persuasion scholars concerned with the construction of effective

public health messages have emphasized clear, direct, and convincing rational arguments

to engage audiences in health behaviors (Bilandzic & Busselle, 2013). Recently,

researchers have turned attention to narratives as alternate means of persuading

individuals who are likely to be difficult to reach or resistant to traditional, didactic

messages (Jensen, King, Carcioppolo, Krakow, & Morgan, 2013).

Narrative persuasion, in simplest form, is the use of stories to persuade. Some

narratives seem to resonate more than others, that is, they linger over generations and

across communities. These stories endure as cultural communicative tools, often called

fables or myths. They may be about real people, realistic characters, or mythical

creatures. They may recall real past events or conjure up fantastical scenes. Yet, each of

these stories succeeds in conveying important information to audiences. Narratives are a

common form of talk about experiences along the cancer continuum, from prevention to

detection to treatment. Researchers are increasingly interested in how cancer

communication is affected by stories of this nature (Kreuter et al., 2007).

Kreuter and colleagues (2007) posit that narratives provide several different

persuasive functions, such as overcoming resistance and increasing attention to health

information. However, they argue that these capabilities can only be realized when the story at hand constitutes a "quality narrative," that is, a story that is "told well" (p. 229). Despite the ubiquity of storytelling in health, the persuasion literature reveals relatively little about the elements that comprise an effective story and about the characteristics of audiences that make them receptive to storytelling. Ideally, persuasion scholars would be able to locate the elements that comprise the perfect cancer story to motivate people to action. To this end, researchers have recently begun exploring narrative typologies, and conducting experimental studies to identify combinations of narrative features that can be most effective in sparking audience engagement with persuasive health messages

The goals for the dissertation are twofold: to contribute to this line of research by examining key message features that enhance persuasive communication about HPV vaccination for young women and to test theorized mechanisms through which such narratives persuade. Through the empirical study of narrative persuasion, the dissertation addresses an important cancer communication topic concerning a prevention behavior currently being promoted to young adults. This project extends the current literature on narrative persuasion theory by identifying and analyzing subset of message features to examine the conditions that produce persuasive cervical cancer narratives and lead to behavior change. An investigation of narrative message features is best conceptualized as a theory-driven, experimental design. It explores questions about the types of storylines that can most effectively drive involvement in narratives and subsequently increase intentions to engage in cancer prevention behaviors. The experimental manipulation of message features can identify optimal narrative elements for persuasion in cancer control campaigns and extend existing theoretical approaches to the modeling of narrative

persuasion.

Foundations of Contemporary Narrative Persuasion Research

Narratives are fundamental tools of human communication and therefore have captured the attention of diverse scholars throughout communication and related fields. The broad nature of the term "narrative" has resulted in a variety of unique approaches being employed across different corners of the discipline to study narrative phenomena. At its root, a narrative is simply a story, a means of conveying information that is universally familiar as "a basic mode of human interaction" (Kreuter et al., 2007). Many scholars have argued that narratives are an innate part of our human experience as social beings, a "fundamental mode of thinking" (Schank & Abelson, 1995). The study of narratives has informed scholarship in areas ranging from classical rhetoric to contemporary literary studies, politics, and health. In order to appropriately situate my own perspective and usage of narrative as a topic of inquiry within health communication, it is necessary to first take a step back and examine the use of the term in communication more broadly and how such conceptualizations have shifted, expanded, and been challenged over time and throughout the literature. This dissertation will first discuss the critical and interpretive traditions that inform, intersect with, and challenge my present approach to health narratives, then define narrative in quantitative persuasion research, and finally, connect my own study of narrative persuasion to theories and applications of health communication scholarship.

The genealogy of narrative in communication is often argued to begin with Aristotle's presentation of logos and pathos as distinct modes of persuasive human

communication. For Aristotle, logos was associated with the realm of logic, reason, and empiricism, such is often found in the world of media effects research. This rational approach is distinguished by argument – consisting of inferential structures for evaluating information and making decisions (Fisher, 1984, p. 3). In this perspective, the rational world of communication is inhabited by "self-evident propositions, demonstrations, and proofs, the verbal expressions of certain and probable knowing" (Fisher, 1984, p. 3).

In contrast, Walter Fisher's (1984) treatise on narration as a human communication paradigm proposed a conceptualization of the human species as *homo narrans*, or the storytelling animal. This perspective aligns more clearly with Aristotle's notion of pathos, an emotive and artistically crafted appeal to persuade. Fischer's "storytelling animal" is often cited in as an alternative paradigm to the classical notion of human as the "rational animal" (Fisher, 1984, p. 1). However, for Fisher and other narrative scholars, there is not simply a dichotomy between these two modes of persuasive communication. Instead, for Fisher, narratives are complex, bringing together "a dialectical synthesis of two traditional strands in the history of rhetoric: the argumentative, persuasive theme and the literary, aesthetic one" (p. 2). In other words, in Fisher's view, all human communication contains a narrative element worthy of scholarly pursuit.

More recent scholarship has rearticulated Fisher's perspective, examining the function of narrative in contrast to more explicitly argument-based, didactic communication. It makes sense, then, that the study of narratives would become contested terrain, at once claimed by English departments as an undertaking by literary theorists interested in the aesthetic composition and affective qualities of great stories and

at the same time staked by a range of communication scholars concerned with the usage of narratives as a rhetorical device, an interpretive tool, and a persuasive message strategy. One of the challenges for narrative scholars that emerges from these varying perspectives is where to focus research efforts – should we be investigating the features of great works that give structure and substance to stories and set them apart from less successful attempts? Or should we instead concentrate our efforts on the effects and outcomes of such stories, evaluating the ways a good story is able to shift the beliefs, attitudes, intentions, and behaviors of the audience?

Originally, the narrative approach was positioned as an alternative paradigm to the traditional understanding of rational persuasive human communication structured by explicit argument (Fisher, 1984). Cognitive scientist Jerome Bruner (1986) expanded on the paradigm from a social scientific perspective, arguing that humans appear to have two distinct, natural (and often complementary) forms of persuasive communication: "A good story and a well-formed argument are different natural kinds" (p. 11). For Bruner, narratives and arguments are not simply alternative forms of messages. Rather, he argued that the rational/argumentative and the narrative approaches to persuasion address two distinct cognitive processes. These two different forms of persuasion function through unique pathways, "each providing distinctive ways of ordering experience, of constructing reality. The two (though complementary) are irreducible to one another" (Bruner, 1986, p. 11). This perspective has often been reiterated by health communication scholars, such as Hinyard and Kreuter (2007), who present the narrative and the "paradigmatic" as two distinct forms of persuasive message approaches that engage unique mental processes. Additionally, Bilandzic and Busselle (2013) argue that

narratives and other forms of persuasive communication should not be depicted as mutually exclusive, and that in fact, many of the more traditional argumentation strategies used by persuasion scholars may actually contain some narrative elements in need of further investigation (p. 200).

Although the terminology varies among scholars and across fields, for consistency I will use the term "didactic" to refer to messages that are structured by the straightforward presentation of rational arguments in non-narrative formats. Messages of this kind oftentimes include direct statements of scientific facts, claims, or statistics, in contrast to narratives, which weave this information into an overarching storyline in more subtle ways. The term "didactic" has previously been utilized by prominent health communication scholars to differentiate between story-based messages and more traditional rhetorical arguments (for an example of this usage, see Slater, Buller, Water, Archibeque, & LeBlanc, 2003). As one investigates the scholarly roots of narrative communication studies, a thread emerges, connecting logos and "the rational animal" and pathos and the "storytelling animal" with contemporary approaches to narrative and didactic persuasive health message scholarship.

Critical and Interpretive Approaches to Narrative

Scholars generally agree that the roots of modern narrative research stem from Fisher's (1984) narrative paradigm. Researchers have extended this paradigm into the study of diverse areas of communication including, but not limited to, persuasion scholarship. Others have taken up narratives as a focus for research within political, rhetorical, and critical communication. For example, Mumby (1987, 1993) has

extensively studied the narrative as a form of social control and argued that narratives serve a political function in organizational contexts. Mumby (1987) presents a critical perspective of narratives, arguing that the study of narratives as communicative tools must necessarily include a consideration of how narratives are situated within ideological structures. He argues that who crafts narratives and what contexts they emerge in paint narratives as inherently political communication devices, as they always represent particular perspectives while excluding others. Critical scholars have also taken up similar arguments within the scope of health communication. Before examining narrative persuasion more specifically, we should first look to critical and interpretive health narrative traditions to better understand how these approaches inform contemporary lines of quantitative persuasion research.

Mohan Dutta (2010) argues that it is the job of critical health communication scholars to examine the overarching power structures that shape meanings of health. His 2010 article on the critical cultural turn in health communication questions the forces that shape public health agendas, the scientific arguments that guide our understanding of modern healthcare, and the economic and political structures that challenge individual, social, and cultural values of health. Critical scholars in this tradition are primarily concerned with the dominant ideological narratives (what we might term "meta-narratives") that shape social constructions of health, illness, and the industries and practices surrounding them. For example, Shugart (2011) has examined the societal shift in how obesity is problematized in mainstream cultural narratives. Her work examines the presentation of obesity in popular media programming and argues that over time, the West has increasingly shifted from personal responsibility toward cultural explanations

and solutions for obesity, a shift which has "novel" implications for tackling the obesity epidemic. While such examples are often quite visible in a large-scale sense (i.e., debates about "Obamacare"), we also see smaller-scale instances of these structures at play in micropractices of health, such as expectations for doctor-patient interactions during an office visit.

In a similar light, health communication scholars Sharf and Vanderford (2003) argue that the exchange of health narratives between patients and providers, or among patients and the community, constitute powerful forms symbolic construction. Narrative processes function to help patients and providers get "on the same page" in terms of understanding how a set of symptoms come together as a definable illness and map out courses of action toward improved health by constructing a series of sequential and sensical events to unfold. Because narratives are powerful communication tools, influencing treatment decisions and behaviors taken by providers and patients, they often become contested communicative grounds upon which parties may challenge each other. As a result, critical health scholars have examined how these stories have often functioned to shut out patient voices, as providers lead the construction of health narratives. However, in the critical view, narratives can also provide a means of resistance for those seeking to challenge dominant ideologies. This approach has led the move toward increased patient-centered communication, involving more active incorporation of patient perspectives in health decision-making.

Critical scholarship questioning the persuasive function of narratives has naturally led to an interpretive turn in narrative studies, particularly in health communication. Interpretive research examines not only the content of messages, but also individuals'

perceptions and responses to (or interpretations of) these messages. That is, interpretive scholars examine the meanings that audiences extract from narratives as they are communicated in various forms. Bosticco and Thompson (2008) note that for interpretive health communication scholars, narratives serve a central role in how we communicate and make sense of illness, coping, healing, and end of life processes. As health and illness come to be seen as communicatively constructed, we can more clearly differentiate between disease, a biological state in the body, and illness, denoted by narrative account of the patient's experiences. For instance, Gibbs and Franks (2002) analyzed the content of women's narratives about experiences with cancer and found that women often engaged many of the same metaphors in order to make sense of their illnesses, such as a "journey," a "fight," and a "war." Identifying common features in the narratives helps researchers to better understand intangible aspects of these experiences and can also function to help providers connect with patients by incorporating these communication strategies. This type of research sheds light on how individuals draw meaning from health experiences and how such narratives contribute to patient identities.

The move to focus on patient narratives has also given way to a line of interventions centered on narratives as a form of therapy or healing. Health communication advocates have developed applications for narratives as sense-making tools for patients, such as engaging in illness journaling and other forms of interpersonal communication of health-based narratives (Bosticco & Thompson, 2008). In these approaches, narratives function to help people make sense of symptoms and diseases, place these events in a context that gives meaning to these experiences, and allow them to be communicated to others. These examples also showcase the broad nature of narrative

research.

The interpretive turn encompasses not only the move to examine patients' experiences as active participants in narrative processes, but also the inclusion of different types of perspectives in the construction of narratives themselves. Sharf, Harter, Yamasaki, and Haidet (2011) argue that health and illness are socially constructed and that quite often, this process takes place in the form of narratives, as individuals construct cohesive series of events that convey their health situations. Because much of the information we share in interpersonal contexts is related through storytelling, narratives are an especially powerful form of symbolic construction. In the area of illness narratives, Scharf et al. (2011) point out that narratives are often used to convey medical information about symptoms and treatments from doctors to patients. Doctors are often the storytellers, who weave together snippets of patient experiences such as symptoms reported, vital signs, and test results, into accounts of illness and treatment. However, as critical scholars have also illustrated, notably absent from such narratives is the voice of the patient him or herself. Therefore, one key aspect of the interpretive turn in health narratives has been to not only understand how patients interpret and understand these illness narratives, but how patients themselves become involved in or excluded from the construction of the narratives.

Alternative approaches to story construction have implicated the patient more directly in the crafting of the narratives, as "alternate routes to knowledge" about health (Sharf & Vanderford, 2003, p. 15). Narratives allow us to transform lists of symptoms or moments marking a decline in health into a cohesive and relatable story. In this way, narratives allow us to interpret series of events into meaningful and relatable accounts of

our lives.

Sharf and Vanderford (2003) explain, "Narratives not only reflect individual views of the world but also provide explanations for why things happen in certain ways" (p. 14). Murray (2002) also draws this connection between individual accounts of experiences and collective representations of health by linking narratives and social representation theory. Murray argues that social contexts, as well as individual perceptions, shape how people come to piece together events into structured narratives and extract meanings from such stories.

The move to situate experiences of health and illness in meaningful contexts has extended from interpersonal health communication to the study of persuasive health campaigns. Larkey and Hecht's (2010) work has promoted the use of narratives as tools for generating culture-centric health messages. Their Model of Culture-Centric Narratives argues that messages crafted for cultural groups can result in more salient and meaningful interactions with public health information (Larkey & Hecht, 2010). Researchers have enthusiastically taken up the call for generating culture-centric health narratives as a way to address social health disparities, for example. Entertainment education theory has led the way in utilizing the power of narratives to influence health behaviors (Singhal & Rogers, 1999). Media effects research reveals that mass mediated health narratives can be useful tools for conveying health information to the general public. Culturally targeted narratives distributed through mass media channels can help message designers more effectively reach specific subsets of the general population. Examples of such messages are seen in the increasing support for telenovelas that incorporate messages about health behaviors into popular Spanish-language programming (Wilkin, Valente, Murphy, Cody,

Huang, & Beck, 2007).

Overall, these critical and interpretive approaches to health narratives have provided a substantial body of compelling evidence supporting the exploration of narratives as tools for persuasive public health messaging. Critical and interpretative traditions have informed contemporary approaches to the study of health narratives by drawing attention to the social and cultural contexts in which messages are shared and emphasizing the importance of studying the meanings that audiences bring to health messages. In particular, these traditions have provided a foundation that allows persuasion scholars to shift focus from purely didactic message strategies to the study of narrative-based messages. As a result, quantitative health communication scholars have begun taking up the study of narrative message features and audience characteristics to investigate how and why narratives can serve as effective persuasive communication tools for health.

Although my own approach to health narratives draws upon a heavily social psychological approach to message design, importantly, this study recognizes the ways in which other research traditions both inform and challenge my research program. As subsequent chapters will illuminate, the present research primarily focuses on individual responses to narrative messages. It is possible that some might challenge this approach as "missing the point" of the larger implications of narratives as sociocultural tools. Therefore, it is crucial to appreciate that the elements of narrative messages I will utilize are always contextualized within larger social and cultural environments, as these traditions make clear. As a result, the narratives designed and tested for the purpose of the present study need to resonate with the individual and collective health experiences of

target audiences. And importantly, as communication researchers craft narrative messages, these traditions point out that each story necessarily conveys only one particular health perspective among many that are possible and that the stories that ultimately circulate play a powerful role in constructing and advancing shared public understandings about health.

Overview of the Present Study: Death Narratives and HPV

The present study utilizes experimental methodology to test the persuasive effects of narrative message features. More specifically, the study models the mediating processes through which narrative message features may influence young women's behavioral outcomes toward HPV vaccination. Additionally, the study integrates existing models of narrative persuasion processes into a more comprehensive theoretical model of how and when narrative persuasion is likely to occur in the context of HPV vaccination and cervical cancer prevention.

To this end, the following chapters present a substantive review of the existing literature and introduce the methodology for the proposed dissertation study. Chapter Two identifies cervical cancer prevention as a crucial issue for public health and reviews known predictors of and barriers to current recommendations for cervical cancer prevention behavior. Chapter Three provides a theoretical foundation for investigating communication about cervical cancer prevention through the lens of narrative persuasion. This chapter first roots contemporary work in narrative persuasion and health communication in a broad lineage of narrative studies across the communication discipline. Next, the chapter provides a functional definition of narrative that can be

operationalized in empirical studies of narrative messages. Chapter Three then identifies

three current theoretical models of individual narrative persuasion processes that attempt

to explain how narrative effects are mediated. This chapter identifies the limitations of

existing models and proposes a more comprehensive model that integrates existing

theoretical variables into a unified approach to narrative persuasion. The integrated model

is also compared to an existing theoretical model from the health communication

literature, with the goal of identifying how narrative persuasion models can ultimately

add to and extend understanding of how narrative-based messages can influence health

behaviors, particularly in cancer control contexts. To this end, data will be gathered from

young adult women to examine narrative effects in the context of HPV vaccination

messaging.

In order to address the proposed research questions and hypotheses, Chapter Four

outlines the proposed methodology for gathering participant data through an experimental

survey design. Procedures for participant recruitment are provided. The experimental

components of a 2×2 factorial design are detailed, and the procedures and measures

employed in the study are articulated. Following the experiment, the proposed models of

narrative persuasion and health behavior are tested. Chapter Five provides the analysis

conducted in order to test hypothesized effects of narrative features and processes across

these models and concludes with the results of these tests. Finally, the implications of the

study's findings are discussed in the concluding chapter. Chapter Six outlines the

contributions of the dissertation project to the development of more effective health

communication and cancer control campaigns and to the extension and refinement of

narrative persuasion theory more broadly. The discussion notes existing limitations of the

current study and concludes by identifying new questions and future directions in

narrative persuasion as this line of research continues to develop.

CHAPTER TWO

HPV, CERVICAL CANCER, AND VACCINATION

Addressing a Critical Public Health Topic

At the heart of crafting narratives about cervical cancer prevention is the need to

thoroughly comprehend current medical knowledge of HPV and cervical cancer

development and existing predictors of and barriers to cancer prevention

recommendations. To more thoroughly understand the basis of public health efforts to

reduce cervical cancer, this chapter first presents an overview of the human

papillomavirus (HPV) and the known biological link between HPV and cervical cancer.

The chapter then introduces the HPV vaccine as a relatively new and medically

recommended route to reducing incidence of cervical cancer and other HPV-related

health outcomes. The chapter then provides an overview of known barriers to HPV

vaccination and discusses key stakeholders in vaccination decision-making. This section

concludes with a critique of several existing HPV vaccination campaigns in order to

inform the present study.

Vaccination is increasingly gaining the attention of health communication

researchers as a cancer prevention strategy. The human papillomavirus (HPV) vaccine

has been federally approved and in use in the United States for 7 years. In that time, the

vaccine has gained momentum as a prevention strategy against several of the most

common types of HPV infection, which will aid in prevention of subsequent infection-related health outcomes, including cervical and other cancers, in years to come (Centers for Disease Control and Prevention, 2013a). However, current vaccination rates among the eligible population are still far from meeting the recommendations of the CDC (Centers for Disease Control and Prevention, 2013b). In order to effectively serve as a public health prevention strategy, as well as a strategy for improving individual health outcomes, vaccination rates for eligible women and men need to improve.

Communication researchers can contribute to public health efforts by studying the variables likely to predict uptake of vaccination behaviors and incorporating these factors into more effective health messages and campaigns targeted toward at-risk and undervaccinated segments of the population. To inform such efforts, this chapter provides an overview of HPV and the HPV vaccine, then identifies known demographic and psychosocial predictors of HPV vaccination in the United States. Finally, the dissertation evaluates several early narrative-based intervention efforts, addresses the limitations of existing research, and highlights persisting questions and concerns. The project concludes with a brief discussion future directions for health communication research to expand upon theoretical understandings and practical implications of HPV vaccination, in which my dissertation will be situated.

HPV and Cervical Cancer

Understanding Human Papillomavirus

While the focus for health communication scholars is on understanding the communicative processes that shape health behaviors, it is also critically important to

have a foundational knowledge of the health topics they are investigating as well.

Therefore, this section will first present an introductory overview of the health topic

addressed in the present study, human papillomavirus vaccination, in terms that

demonstrate my comprehension of the virus in a scholarly context. This information is

then translated into vernacular language that could be presented to a neighbor or friend

debating whether to pursue the vaccine for her daughter.

Human papillomavirus, or HPV, is a DNA virus classified as a sexually

transmitted infection (Ylitalo, Stuver, & Adami, 2008). Globally, HPV is the most

commonly transmitted sexual infection, with a lifetime risk of infection as high as 75%

for most individuals (Ylitalo et al., 2008). HPV is also the most common sexually

transmitted infection in the United States, with over 14,000,000 new infections among

Americans each year (Centers for Disease Control and Prevention, 2013c). Substantial

evidence has linked HPV to numerous health complications, including the development

of cervical cancer in women. Cervical cancer is the second leading cause of cancer deaths

among women around the world (Garland & Smith, 2010). In the U.S alone, there are

approximately 12,000 new cases of cervical cancer diagnosed and almost 4000 cervical

cancer deaths each year (Centers for Disease Control and Prevention, 2013b).

The virus infects skin keratinocytes (cells on the outermost layers of the skin) and

mucous membranes, making the infection easily transmittable through skin-to-skin

contact (Ylitalo et al., 2008). As a result, the infection is commonly spread through

sexual contact. Over 150 distinct types of HPV have been clinically identified, with over

40 of these types primarily affecting genital areas. Predominantly genital strains of HPV

are then further classified into low- and high-risk types. Low-risk types,[1] including HPV

6 and HPV 11, can produce symptoms such as genital warts and benign cervical lesions.

High-risk types, including HPV 16 and HPV 18, can lead to the development of

squamous cell carcinoma and adenocarcinoma of the cervix and other areas of the body

(such as throat, penile, and anal cancers). Combined, these two types of HPV (16 and 18)

pose the greatest risk for the development of cervical cancer, accounting for

approximately 70% of all cervical cancer cases (Gillison, Chaturvedi, & Lowy, 2008).

Almost two-thirds of squamous cell cervical cancer results from these two types alone

(approximately 50% of squamous cell cervical cancer can be directly linked to HPV 16,

and another 12% linked to HPV 18). Additionally, the vast majority of cervical

adenocarcinoma is associated with HPV 18. Because it is an infection, the body's

immune system responds to the introduction of HPV. Most infections self-resolve within

1 to 2 years of infection (Holman, Benard, Roland, Watson, Liddon, & Stokley, 2014).

However, infections that persist or recur are more likely to invade the chromosomes of

host epithelial cells and "induce carcinogenesis" (Ylitalo et al., 2008, p. 449).

Additional risk factors such as tobacco use, diet, obesity, and genetic

predispositions have been suggested as possible alternate causes of cervical cancer.

However, converging research across medical fields increasingly agrees that it is likely

these risk factors are mediated by the presence of high-risk HPV types in the body

(Ylitalo et al., 2008). For example, it is possible that smoking increases risk of cervical

cancer by suppressing the immune system, allowing a high-risk HPV infection to persist

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[1] The terms "low risk" and "high risk" are used by Ylitalo et al. (2008) to distinguish between strains of HPV that are predominantly associated with the development of cervical and other cancers (high risk) or with noncancerous health outcomes as noted above (low risk).

and advance into cancer. Medical literature currently argues that all cervical cancers and a "sizeable proportion of cancers of the anus, oropharynx, penis, vagina, and vulva are etiologically related to HPV infection" (Chaturvedi, 2010, S24).

For years, screening (most often with the Pap test) has served as the primary mechanism through which HPV-associated lesions and other precancerous symptoms were identified and subsequently treated. However, screening for HPV only works to identify the presence of the HPV virus and the development of abnormal cervical cells, but cannot determine whether such cells are likely to clear up or persist and develop into cancer. Also concerning is that often, HPV infections are symptomless and may not be identified in the absence of routine screening practices. Ultimately, screening can help detect the virus, but cannot prevent HPV infections from developing in the first place. Therefore, medicine is increasingly pushing for a combined approach consisting of prevention, screening, and treatment together in order to combat HPV as an individual and public health issue. In particular, over the past decade, substantial interest has grown in the use of vaccines as an HPV prevention strategy, and early results suggest that this strategy may prove to be an effective course of action in preventing HPV infection and eradicating subsequent negative health outcomes associated with the virus (Centers for Disease Control and Prevention, 2013c).

A Brief History of HPV Vaccination

There are currently two HPV vaccines approved by the federal Food and Drug Administration (FDA) for use in the United States, Cervarix (produced by GlaxoSmithKline) and Gardasil (produced by Merck & Co.). In 2006, the FDA approved

the first HPV vaccine, Gardasil, for females aged 9–26. In 2009, the FDA approved Cervarix for females aged 10–25. Although the two vaccines share many similarities, they have several key distinctions. Cervarix has been approved for use in women starting at age 10, and immunizes patients against HPV types 16 and 18, the two strains most commonly associated with a variety of HPV-related cancers. This vaccine has also been shown to produce higher levels of antibodies against these HPV strains in some studies, making an argument for this vaccine as more efficacious in preventing infections of HPV 16 and 18 over the course of one's lifetime. However, a concern is that the vaccine does not protect against several other common strains, particularly those associated with genital warts.

Gardasil is the more commonly employed of the two vaccines. Gardasil is currently approved for use in women and men starting at age 9. Gardasil is a quadrivalent vaccine and immunizes against four common HPV types (6, 11, 16, and 18). Gardasil is also well-known for running a prominent campaign titled "One Less" to promote the vaccine. The vaccine is given in three doses over the course of 6 months. In addition to increasing interest in and uptake of the vaccine altogether, health communication researchers are also concerned with how to encourage girls and women to complete the vaccination series once the first shot has been received, as individuals often fail to receive subsequent doses. Given what is currently known about the vaccine, the endorsement the vaccine has received from the medical community and from federal health agencies, and the prevalence and severity of HPV-related health outcomes, I suggest that the HPV vaccine offers an effective first step toward eradicating this public health concern.

The introduction of the HPV vaccine has been called an important win or

"remarkable public health achievement" (Brewer & Fazekas, 2007, p. 108). However,

vaccination rates are far below federal health recommendations for children, teens, and

young adults (Centers for Disease Control and Prevention, 2013b). As a result, a body of

literature has emerged across medicine, psychology, and health communication to

identify variables that can aid in predicting who is likely to engage in HPV vaccination

and what factors prevent people from engaging in this preventive health behavior.

Predictors of HPV Vaccination

The following overview of known predictors focuses on findings concerning.

HPV vaccination in the United States specifically. This focus allows us to better

understand and contextualize vaccination behavior within the cultural context and history

of U.S. medical institutions and public health approaches, as well as within the confines

of national politics and regulatory efforts including FDA approval of two HPV vaccines

and subsequent CDC vaccination recommendations for the population. Such an approach

allows health communication scholars to better understand the impact of HPV

vaccination not only in improving individual health outcomes, but also as a large-scale

and long-term public health initiative for both virus and cancer prevention.

Demographic Predictors

Interestingly, known demographic predictors of HPV infection and of cervical

cancer do not necessarily correspond with likelihood of vaccination. Brewer and Fazekas

(2007) found that although a few individual studies found significant differences among

women of different racial and ethnic backgrounds, such findings may be due to issues

with study designs (such as sampling issues). On the whole, race and ethnicity did not appear to influence perceptions of vaccination acceptability nor intention to vaccinate (e.g., Slomovitz et al., 2006), despite the significance of race/ethnicity in predicting cervical cancer development (Brewer & Fazekas, 2007). Additionally, the influence of socioeconomic status and education level on vaccinations is mixed across studies. It is possible that education and socioeconomic status are related to vaccination through structural variables, such as cost of the vaccine or health insurance status.

Age may make a difference in vaccination intentions among parents and young adults. Parents are generally more likely to vaccinate an older child than a younger one, and this may be due to related factors such as concerns about sexual activity, physician recommendation, etc. Sex of the child also plays a role in vaccination acceptability and behavior. Despite CDC recommendations that both males and females be vaccinated, parents are significantly more likely to approve of vaccinating daughters than sons (Brewer & Fazekas, 2007). Another predictor is parental willingness to vaccinate themselves if given the option. This variable may play a more important role in the next decade, as the first wave of HPV vaccination recipients become parents of vaccine-eligible-aged children. Parental and individual medical history also influence vaccination behavior. Parents who have had experiences with HPV and cervical cancer are more likely to vaccinate their children. As well, women who have had irregular Pap test results are more likely to engage in vaccination.

HPV Infection and HPV Vaccine Knowledge

Despite the prevalence of HPV and the link between HPV and an array of negative health outcomes, one widespread potential barrier to vaccination is a general lack of knowledge of these issues among target populations. Across studies, participants largely demonstrate low knowledge of HPV in general and of the relationship between HPV infections and health outcomes, including cancer (Brewer & Fazekas, 2007). Therefore, many existing campaigns have focused on increasing knowledge of HPV and of the relationship between HPV and cancer. However, knowledge and awareness have produced inconsistent, and often null, findings in terms of predicting HPV vaccination acceptability. In several recent studies, low knowledge did not correlate with vaccination uptake, leading researchers to argue, "much of the existing behavioral research on the vaccines appears to be missing important opportunities" (Brewer & Fazekas, 2007, p. 108). Put another way, research that focuses on increasing HPV vaccination through awareness-oriented education overlooks some crucial variables that may be more effective in predicting vaccination behavior.

Psychosocial Predictors

A looming issue among the mixed findings across many of traditional demographic predictors is that lack of consensus makes it difficult to create effective campaigns that resonate and address the concerns of at-risk populations. As a result, researchers have moved beyond demographic variables to examine social and behavioral characteristics that may influence vaccination behaviors. To date, attempts to promote the vaccine and to determine who is likely to engage in vaccination have focused on a limited

array of behavioral predictors. Brewer and Fazekas' (2007) widely cited review provides the most comprehensive overview of HPV vaccination predictors. Their work summarizes findings from 28 empirical studies, identifying known demographic and psychosocial predictors and suggesting productive future directions for continued research in this area. Importantly, the review focuses on theoretically-derived psychosocial variables, which have proven more fruitful in predicting vaccination acceptability and intentions to vaccinate. Brewer and Fazekas (2007) emphasize the importance of generating a priori predictions about vaccination behavior, grounded in health communication theories. Accordingly, I offer a brief review of a common theoretical framework used in studies of HPV vaccination behavior, then discuss specific predictors that have emerged from this line of research.

A central theoretical framework underlying much of the HPV vaccination behavioral research is the Health Belief Model (HBM). In the 1950s, researchers interested in promoting public health argued that studies focusing on the relationship between demographics and health behaviors were limited as demographic characteristics cannot be altered by health campaigns and therefore cannot easily shift health behaviors. As a result, researchers began to seek out "modifiable psychological characteristics correlated with health behavior" that could be modified through effective messaging (Sheeran & Abraham, 1996, p. 23).

The Health Belief Model (HBM) is a prominent theoretical model that developed out of these midcentury efforts. In particular, early HBM research drew upon the work of Lewin and colleagues (1951) to investigate the role of personal beliefs and perceptions in influencing one's health behaviors. The HBM focuses on two main categories of

psychological perceptions: threat perceptions and behavioral evaluations (Sheeran & Abraham, 1996). Threat perceptions include both one's perceived susceptibility to a health issue and perceived severity of the threat. Behavioral evaluations entail both the benefits and barriers (costs) one associates with the recommended health behavior. Finally, the Health Belief Model posits that if both threat and behavioral evaluations are successful in generating appropriate beliefs about the health behavior, cues to action will ultimately trigger this behavior into action. Early HBM research emphasized studies of preventive health behaviors. Decades later, the model continues to serve as a key theoretical approach for identifying psychological predictors of contemporary preventive behaviors, such as HPV vaccination. Drawing from Brewer and Fazekas' (2007) evaluation of the existing literature, I review the influence of the HBM's key constructs in predicting HPV vaccination behaviors.

Perceived susceptibility. Perceived susceptibility (also referred to as perceived likelihood) to HPV is a HBM construct that can predict vaccine acceptability. Across a number of reported studies, 21 to 46% of participants believed they were susceptible to or likely to get an HPV infection and subsequently had higher support for the vaccine (Brewer & Fazekas, 2007). One limitation of this predictor is that it has primarily been measured as susceptibility to HPV in a broad sense, rather than susceptibility to specific outcomes of HPV infections, such as genital warts or cervical cancer.

Perceived severity. Women generally consider cervical cancer to be a severe health outcome. However, most studies examined the perceived severity of HPV more generally, and this was not a predictor of vaccine acceptability for young adult women. However, the perceived severity of HPV was a predictor for *parental* acceptability of the

vaccine.

It is interesting but unfortunate that perceptions of cancer severity do not connect with vaccination behavior for young adults. It is possible that although people perceive this health risk to be severe, they are not drawing the conclusion that the vaccine offers a way to help prevent the onset of cervical cancer. Some existing educational campaigns are attempting to address this knowledge gap, although the outcomes of such efforts remain to be seen.

Perceived effectiveness. As perceived efficacy of the vaccine to prevent HPV increases, young adults and parents report greater intentions toward vaccination behaviors. Again, however, is the issue that perceived effectiveness has generally been measured as efficacy to prevent HPV infection, rather than efficacy to prevent specific outcomes such as genital warts or cancer.

Perceived barriers. Barriers are a substantial concern for researchers and practitioners seeking to increase HPV vaccination behavior. A variety of empirically identified structural and psychosocial barriers to vaccination can hinder or promote willingness to vaccinate. To date, most studies of HPV vaccination barriers have focused on barriers experienced by parents and healthcare professionals in making vaccination decisions for minors (Holman et al., 2014). However, exploring barriers for parents and professionals can aid in understanding barriers that may also exist for young adults as they consider HPV vaccination. Most recently, Holman and colleagues (2014) conducted a systematic review of the literature on barriers to HPV vaccination in the United States. The review identified numerous structural barriers such as financial concerns such as cost and insurance coverage and knowledge gaps about HPV, cancer, and the vaccine itself.

Importantly, the study also identified the potency of social barriers including beliefs about vaccine-related sexual behavior and concerns about social perceptions of the vaccine.

Structural barriers include physical and financial access to the vaccine itself. Cost is a sizeable barrier and is often linked to presence or absence of health insurance to cover the vaccine. As cost increases (or insurance decreases), people are generally less likely to intend to vaccinate. Additionally, physical concerns about the vaccine may shape vaccination behaviors. Perceived safety and side effects of the vaccine are also predictors. Holman and colleagues (2014) found concerns about adverse effects and general safety of the vaccine, particularly given the relativeness newness of the treatment, to significantly predict parental willingness to obtain the vaccine for their children. People who fear the discomfort of a shot or perceive vaccinations to generally be unsafe are also less likely to vaccinate.

Concern about promoting sexual activity is another substantial barrier. Whether parents view the vaccine as promoting sexual activity in teens makes a difference (Brewer & Fazekas, 2007; Holman et al., 2014). Parents may be concerned about the repercussions of sexual activity itself, as well as concerns about the moral and social implications of promoting such activity. Parents who associate the vaccine with increased sexual activity are likely to postpone vaccination until teens are older or to avoid HPV vaccination altogether (Holman et al., 2014). Social judgment surrounding the vaccine is also a factor for young adults. As a result, young women concerned about perceptions of promiscuity are less likely to engage in vaccination (Krakow, Jensen, Carcioppolo, Guntzviller, Weaver, & Liu, 2015).

Cues to action. When the preceding aspects of the Health Belief Model have effectively produced or bolstered positive beliefs about the behavior, cues to action can push beliefs into action. Thus, social and structural support for HPV vaccination increase the likelihood of vaccinating for both young adults and parents. For example, people are generally more likely to find the vaccine acceptable if a physician were to recommend it. However, existing beliefs moderated this relationship, such that individuals who already held antivaccination beliefs were less likely to be swayed by physician recommendation. Institutional cues to actions can generate large-scale uptake of health behaviors. Not surprisingly, school requirements were a large predictor of whether parents would vaccinate (Brewer & Fazekas, 2007).

Social Perceptions

Social perceptions also influence individual vaccination behaviors. People who believe others in their social networks hold favorable beliefs about the vaccine are more likely to get vaccinated. Social perceptions of HPV and of the vaccine itself may work in complex ways to predict vaccination behavior as people consider how family members and peers will perceive their behavior or offer support. For example, Krakow and colleagues (2015) found that religiosity moderated concerns about promiscuity reputation in predicting vaccination intention. Those who had greater religious involvement were less likely to vaccinate because they were concerned that vaccination would be perceived as a sign of promiscuity. These findings indicate that both physical and social concerns can play a large role in the health decisions people make about prevention strategies associated with sexual behaviors.

Many of the known predictors of HPV vaccination draw from the theoretical framework of the health belief model to focus on perceptions of susceptibility, severity, benefits of, and barriers to receiving the vaccine. We have seen a range of variables, including demographics, psychosocial variables, and social perceptions, that can converge to generate complex models to assist researchers in predicting who is likely to engage in the HPV vaccination and who is likely to benefit from more nuanced messaging. These known predictors offer a productive starting point for future research seeking to increase health behaviors through public health campaigns.

Stakeholders

Other important factors to consider include the range of stakeholders participating in health decisions about the HPV vaccine. For those under 18, parents are primary decision-makers. Individuals aged 18–26 are often autonomous decision-makers, but may also be greatly influenced by their families. Finally, recommendations from doctors and other health providers appear to exercise significant influence over the vaccination behaviors of individuals at all ages. Therefore, it is important for researchers to consider the concerns of these stakeholders and the factors likely to influence or inhibit behaviors related to HPV vaccination.

Patients. Not everyone who is eligible for the vaccine can be lumped together into a homogenous group of patients. There are two key demographic distinctions that researchers should consider when evaluating predictors of and considerations for groups targeted by vaccination campaigns: age and sex. Age is an important consideration because current FDA recommendations encourage the vaccine for children as young as

age 9 and young adults up to age 26. This means the decision to get the vaccine will fall to parents for the majority of patients (9–17) and to young adult patients themselves in other cases (ages 18–26). Therefore, it is reasonable to assume that different health messages may appeal to or persuade decision-makers in different ways across these two groups. Additionally, the targeted population for the vaccine now includes both women and men. However, much of the health education and messaging to date has continued to focus on female vaccination and the prevention of cervical cancer, despite the health concerns that HPV poses for men as well. It is also important for health researchers to consider how HPV affects men and what types of factors influence male vaccination behavior.

Parents. Parents certainly want the best health outcomes for their children and may be more likely to consider long-term health consequences than adolescents would for themselves. However, immediate social concerns may act to override concerns about physical health. As we have seen, concerns over their children's sexual activity is a looming barrier for parents (Zimet, Liddon, Rosenthal, Lazcano-Ponce, & Allen, 2006). This is particularly troubling, as HPV vaccination is most effective when administered before the onset of sexual activity, prompting parents to consider the issue much earlier than they may have anticipated. Several groups of parents have received considerable attention by the mass media as well as by health researchers seeking to understand attitudes and behaviors toward HPV vaccination. A small but vocal group consists of parents who are generally antivaccinators, regardless of vaccine content (Blume, 2006).

Additionally, much attention has been focused on parental concerns that the HPV vaccination will encourage earlier sexual activity among teens. However, past research

on the efficacy of sex education and condom distribution programs did not find a correlation between the availability of sexual health information and prevention resources and actual sexual behavior (Brewer & Fazekas, 2007). Moreover, parental attitudes toward the vaccine reveal generally high levels of acceptability, despite this potential concern (Zimet et al., 2006). For most parents, the emphasis on the future health of their children and the ability to prevent serious infections that could lead to cancer and other illness appears to trump concerns about source of the infection or association of the vaccine with HPV.

Health providers. Providers play a key role in the decision to vaccinate. We know that recommendations from doctors, nurses, and other healthcare providers can be quite influential in shaping attitudes toward the vaccine, as well as actual vaccination behavior. One concern is that despite the potential influence they have on parents and patients, doctors themselves may not have adequate knowledge or resources to make such recommendations or adequately answer questions and respond to concerns about the vaccine (Zimet et al., 2006).

However, knowledge may not necessarily influence whether a doctor actually recommends the vaccine. Instead, other factors can potentially influence such recommendations. For example, in a summary of four separate studies, doctors generally demonstrated a preference for vaccinating girls over boys, and older over younger teens (Kahn et al., 2010). Doctors who spent more time with adolescents and who had more sexually active teen patients were more likely to express acceptability for the vaccine. Such attitudes are cause for concern, as the vaccination appears to be most effective when administered to pre-teens and teens prior to becoming sexually active (generally, between

ages 10–13), and is now approved for both male and female adolescents. Moreover, doctors were more likely to recommend the vaccine if it was endorsed by other health professionals and particularly professional health organizations. Therefore, health providers should carefully consider how they communicate with patients and families about this important health decision. Health communicators might also consider developing messages that address the concerns and questions of health providers, in addition to targeting parents and young adults.

Learning From Past Campaign Evaluations

Early attempts to evaluate HPV vaccination campaigns, and mass media messages more generally, have taken many analytical forms, including content analysis (e.g., Johnson, Sionean, & Scott, 2011) and feminist discursive analysis (Mamo, Nelson, & Clark, 2010). Persuasion scholars are particularly concerned with the empirical evaluation of theoretically-oriented and research-drive health campaigns. Many campaigns have been implemented with good intentions but ultimately, minimal effects on vaccination behavior. One downfall of many public health efforts is failure to collect and analyze data on the outcomes of the campaigns. Prior to executing my own study of HPV vaccination messages, it is important to examine existing campaigns for which data has been collected and made publically available, allowing for empirical evaluation of the message strategies likely to influence vaccination behaviors.

Because the vaccinations have been widely available for over 7 years, the literature describing and evaluating early campaigns to increase awareness and as well as actual uptake of vaccination has grown exponentially since 2006. Many of these

campaigns have focused on increasing awareness of the vaccine as well as promoting

vaccination to parents of pre-teen and teenage girls (e.g., Shafer, Cates, Diehl, &

Hartmann, 2011). Fewer campaigns have focused on older girls and young women

eligible for vaccination. Two campaigns in particular offer valuable insights that will

inform my own approach to the design, implementation, and assessment of narrative

messages for young adult women about HPV vaccination. The following discussion

provides examples of two recent public health campaigns that utilized narrative HPV

vaccination messages aimed at young adult women as well as parents of teen girls. Both

campaigns shed light on methodological approaches and challenges that will inform my

dissertation project.

Campaign 1: Culturally Tailored HPV Video Messages

Hopfer (2012) conducted a longitudinal study (2 months) of female college

students to examine the impact of culturally appropriate video messages on HPV

vaccination behavior. The researchers obtained contact information for 1000

unvaccinated women from the college health center. Ultimately, 40% of the women

participated in the study. This study applied culture-centric narrative theory (Larkey &

Hecht, 2010) and exemplification theory (Zillmann, 1999) to examine how prototypical

narratives and the sources of those narratives can influence HPV vaccination behavioral

outcomes.

Prior to the development of campaign messages, Hopfer (2012) first conducted

interviews with women aged 18–26 to identify prototypical narratives about HPV

vaccination that circulated among this population. Next, common or typical narratives

condensed and developed into scripts to be used in the actual construction of campaign materials. The scripts were delivered on camera by three different sources: a peer, a health provider, or a combination of peer and provider. This variation allowed researchers to investigate the effectiveness of narratives as persuasive HPV vaccination message strategies and whether the source of a health narrative may impact the persuasive appeal of the message.

Ultimately, Hopfer (2012) found support for narratives as an effective message strategy for increasing behavioral outcomes. Additionally, evaluation of this campaign found the source of the message to be an influential component in whether vaccination behavior was initiated. Messages engaging a combination of peer- and provider-delivered narratives were significantly more influential than either source alone or a non-narrative control condition. Assessment of the campaign also sheds light on one of the mechanisms through which narrative health messages can persuade. Specifically, the HPV narratives appeared to increase vaccination uptake indirectly through increasing self-efficacy of the participants. The researchers suggest that narratives can boost self-efficacy by normalizing HPV vaccination and modeling behaviors that overcome common barriers to vaccination, including increasing awareness of how the vaccine works, where the vaccine can be obtained on campus, and how to schedule an appointment for the vaccination.

This study suggests several important facets of narrative health messages to be considered in the design and assessment of future campaigns. At the same time, the study also points to some limitations future projects can work to avoid. The study suggests the utility of a longitudinal design in order to measure both intention to vaccinate as well as initiation of the vaccination series. However, the 2-month length of the experiment did

not span enough time to examine whether the vaccination series was completed by participants. Longitudinal studies spanning 6 or more months are needed to determine whether persuasive appeals are effective in motivating participants to begin and complete all three vaccines.

Campaign 2: HPV Vaccination Radionovelas

Kepka and colleagues (2011) utilized a culturally tailored Spanish language program to promote HPV vaccination to parents in south-central Washington state. This campaign used the radionovela format, an inherently narrative-based message structure, which has been shown to be an effective delivery platform for other health prevention promotion efforts (e.g., Wilkin, Valente, Murphy, Cody, Huang, & Beck, 2007). The campaign entailed a multistep development process for message development, testing, and implementation of HPV vaccination messages targeted toward Spanish-speaking parents of girls ages 9–14. First, the research team conducted focus groups with parents to generate themes for the novella content. Themes were narrowed into fotonovelas (stories told through photograph depictions). Focus groups again selected the top two fotonovelas, which were then developed into radionovelas (dramatic audio stories for radio broadcast). Focus groups also provided feedback on the final radionovelas.

Finalized radionovelas were then distributed through a local Spanish-language radio station, during regularly programmed broadcasts. An experiment was conducted, in which a convenience sample of parent participants were randomly assigned to either intervention (HPV novela) or control (non-novela prostate message) to determine if exposure to the intervention message influenced beliefs and decision-making factors

about HPV vaccination for their daughters. Participants were surveyed at two times, before receiving the message and after the message. Responses across the conditions and the two time periods were analyzed to determine if the message conditions altered beliefs about the HPV vaccine in Spanish-speaking parents of teenage girls. The intervention message condition (culturally-tailored novela) significantly increased parental beliefs that their daughters were not too young to get the vaccine and beliefs that the other (nonsurveyed) parent would support the vaccine. The novela message not generally improve self-efficacy or perceived likelihood of getting vaccine over the next year, although slight increases were seen in parents demonstrating higher rates of acculturation.

This campaign evaluation offers valuable insights by addressing some of the key social components likely to influence parental decision to vaccinate their daughters. The campaign incorporated narrative components drawn directly from target population into public messages that are culturally tailored to the group. The culturally tailored approach had varying degrees of success. Assessment of message effects included measurement of participant acculturation level, and small but significant results suggest that acculturation may be a variable of interest for future narrative campaign researchers. One limitation of this campaign example is that actual components of the narrative were not manipulated. Although the overall effects of the radionovelas were observed, it remains unclear which features of the novelas may be most influential and can be translated into successful messaging in the future. The campaign's success is also limited by the lack of additional narrative-processing and behavioral outcome variables. Future research can expand upon this study design by including measures that examine the relationships between message features, audience characteristics, and the processes through which narratives appear to

influence behaviors (such as transportation). Additionally, the project focused on shifts in parental beliefs about the health behavior, but did not extend the study to include intentions and implementation of the vaccine. Future studies should consider more longitudinal designs that track participants over longer periods of time in order to determine how campaigns can influence the trifecta of beliefs, intentions, and ultimately behaviors as well.

Together, these two campaigns illustrate the importance of systematic, theory-based approaches to health message design and campaign evaluations (Shafer et al., 2011). Past research has shown the Health Belief Model to offer valuable constructs, such as perceived threat, self-efficacy, benefits, and barriers, which can be incorporated into both components of HPV vaccination messages as well as in evaluations. Such theoretically-grounded approaches demonstrate the value of research-oriented approaches at both the preproduction message stage and in message testing prior to the launch of a widespread campaign (Shafer et al., 2011). For narrative researchers, the use of interviews and focus groups can help identify stories that are likely to resonate with target audiences because they are culturally appropriate and prototypical of audience experiences. Additionally, message testing can help researchers identify the structural components that are central to the crafting of effective messages (such as narrative message source), and the psychological mechanisms through which narratives are likely to persuade audiences (such as modeling behaviors that overcome barriers). This approach places importance on precampaign research and extensive message testing, steps that my two-study dissertation design will encompass.

Overall, research on predictors of HPV vaccination sheds light on several key

theoretical variables, although findings on psychosocial predictors, as well as the varied influences of doctors, parents, and patients themselves are quite mixed. The discrepancies among study findings are in part due to methodological limitations, including a variety of methodologies employed across studies, making meta-analysis or systematic summaries difficult to produce, as well as small and nonrepresentative sample sizes. Additionally, studies have varied widely in the health outcome measures used. Earlier studies primarily examined acceptability of vaccination as an outcome, more of an attitude than actual behavior. Other studies have examined intentions to vaccinate, while few have conducted longitudinal studies evaluating actual vaccination behavior spanning the full series of all three vaccinations. As a result, the limitations of the current literature make it challenging to develop theoretically-grounded messages and campaigns. Researchers should be careful not to base interventions on singular study findings. More attention should also be given to the use of multiple health outcomes.

Despite these shortcomings, both the general literature on HPV vaccination predictors and existing evaluations of early narrative HPV vaccination campaigns suggest some interesting and productive directions for my future research. An interesting but flawed recommendation from much of the literature has emphasized the lack of general knowledge about HPV and the HPV vaccination. As a result, these studies have called for campaigns to increase knowledge and awareness. However, correlations between knowledge and vaccination acceptability or intention appear to be in many cases weak or inconsistent (Brewer & Fazekas, 2007). Although the logic behind the educational campaign approach is clear, the empirical evidence suggests that educational campaigns alone will not be enough to persuade unvaccinated populations to engage in HPV

vaccination. Therefore, I intend to examine factors beyond awareness that can ultimately shape the uptake of HPV vaccination behavior, although it will also be important to continue to track measures of knowledge and awareness as we close in on a decade of vaccine promotion. Research that engages psychosocial and behavioral elements of vaccination uptake is better-positioned to reach out to target groups who undervaccinate. Campaigns incorporating messages that address social, psychological, and logistical concerns can utilize narratives in culturally appropriate contexts to more effectively engage audiences, reduce obstacles to receiving the vaccine, and promote meaningful communication to dismantle negative social perceptions of the vaccine. Campaigns of this nature hold promise as more effective health communication tools for generating positive beliefs and attitudes, increasing intentions, and ultimately promoting preventive behaviors that will benefit individual and public health.

CHAPTER THREE

A REVIEW OF NARRATIVE PERSUASION RESEARCH

The following chapter synthesizes the literature on narrative communication into a brief history of the historical study of narratives broadly across the communication discipline and provides a theoretical foundation for the current operationalization of narrative in empirical narrative persuasion research. A central goal of theory within the study of communication is to explain causal processes and to identify the circumstances of how and why message features can produce persuasive effects (Slater & Gleason, 2012). Therefore, the second half of the chapter summarizes three existing process-oriented models of narrative persuasion and health behavior and proposes a move to integrate these models into a more comprehensive theoretical approach of narrative features, processes, and effects.

Defining Narrative in Health Communication

Differentiating narratives from other forms of communication is a useful distinction in efforts to enhance the efficacy of persuasive narrative communication. In the broadest sense, a narrative is a story and is easily distinguishable from information presented in non-narrative formats (Kreuter et al., 2007). However, it is helpful for narrative persuasion scholars to develop a more specific and comprehensive definition

that can be usefully operationalized into empirical research designs.

Fisher (1984) defined narration as "a theory of symbolic actions – words and/or deeds – that have sequence and meaning for those who live, create, or interpret them" (p. 2). Narratives have also been simply described in the literature as the "symbolic representation of events" (Bilandzic & Busselle, 2013, p. 201). This succinct definition casts a wide net that can include short statements, such as "I went to the store," as well as more extensive and multifaceted descriptions of series of occurrences experienced by multiple characters. However, I argue that a functional definition of narrative for quantitative scholars must narrow down these broad parameters. To this end, we can draw upon scholars from literature, cognitive science, social psychology, and communication studies to guide the development of a more specific definition.

Schank and Berman (2002) root their understanding of narratives in cognitive science. In this view, stories are defined as cases of experiences that operate as useful memory devices. Here, stories are not simply collections of assorted details from a given time period. Instead, stories or narratives present well-constructed cases of these experiences. As our minds piece together details and events in a sensical fashion, this information is stored collectively as a case, allowing for mental indexing of these experiences that facilitates recall. Formally, Schank and Berman (2002) define a story as "a structured, coherent retelling of an experience or a fictional account of an experience" (p. 288).

As scholars piece together this evolution of a definition, several key points become clear. There appear to be some consistent structural elements that we can agree exist in a cohesive narrative message. As well, narratives appear to serve some basic

communication functions, such as providing explanation of events in a way that makes coherent sense of an assortment of story elements. Bilandzic and Busselle (2013) elaborate on the possible functions of narratives, stating that they can be "thought of as a description of events and characters . . . presented possibly to enlighten, certainly to entertain" (p. 200). This definition describes narratives primarily in terms of the presence of a few basic features (events, characters) and the functions the narrative accomplishes (enlightening and entertaining). Similarly, Moyer-Guse and Nabi (2010) note that story-based messages contain, "an identifiable beginning, middle, and end that provides information about scene, characters, and conflict; raises unanswered questions or unresolved conflict; and provides resolution" (p. 29).

Schank and Berman (2002) identified several consistently key elements of stories to be goals, expectations of failures, opportunities for learning, and explanations of occurrences (p. 300). Bilandzic and Busselle (2013) state that the events depicted in narratives may be presented explicitly through description or implicitly through other elements of the narrative. The example of "I fell down" implies a previous event not explicitly stated for the reader, that one was standing up prior to the fall. Even in this simple example, we see the traditional structure of a narrative emerge, in which events take place in a linear and often causal sequence for a central character (the narrator). Hence, narratives can include both implicitly and explicitly articulated elements.

Kreuter et al. (2007) usefully define narrative more specifically as "a representation of connected events and characters that has an identifiable structure, is bounded in space and time, and contains implicit or explicit messages about the topic being addressed" (p. 222). This working definition will guide my own research of

narratives in cancer communication.

The present approach to narratives draws heavily from the existing conceptualizations posed by these quantitative health communication scholars. Green (2006) argues, "Part of the power of narratives is their ability to give concrete form to abstract ideas" (p. S169). Therefore, it is imperative that my working definition of narratives not only capture the nature of narratives as essential tools for persuasive human communication, but also encompass tangible elements that comprise narrative structures. In my work, a health narrative is defined as *an organized representation of connected events and characters with an identifiable structure and components, containing implicit or explicit messages about a health behavior, to produce persuasive outcomes*. A definition of this nature illustrates the function of narratives as communicative tools that integrate events into comprehendible accounts and provides a roadmap of measurable narrative features that may be operationalized, analyzed, and developed through empirical research.

Scholars regularly encounter narratives in conveying and exchanging health information, whether through a patient explaining health symptoms to a doctor or one family member relaying a course of health-related events to another, yet the uptake of narratives as a rigorous approach to the study of persuasive health communication has been widely overlooked until quite recently. Hinyard and Kreuter (2007) note that despite the ubiquity of storytelling, narrative research has been largely overshadowed by persuasive studies on the effects of various didactic message strategies. As narratives have gained more attention as a strategy with significant potential for enhancing health message design, much of the research has taken the approach of asking which is better,

narratives or more traditional argument-based messages. Studies of this nature have typically compared information presented in statistical or other didactic form to similar information presented in narrative format. Examples of such research include the testing of narrative versus statistical messages to decrease tanning bed use (Greene & Brinn, 2003; Greene, Campo, & Banerjee, 2010), reactions to narrative and statistical organ donation messages (Kopfman, Smith, Ah Yun, & Hodges, 1998), and experiments examining the impact of narrative and statistical images on comprehension of social determinants of health (Lundell, Niederdeppe, & Clarke, 2012).

This collection of studies has yet to produce a definitive answer to the question of whether the narrative or the didactic message is the best persuasive approach. Over a decade ago, Allen and Preiss (1997) conducted a meta-analysis of 15 narrative-versus-statistical message studies and concluded that overall, statistical messages outperformed narrative messages in terms of persuasive effects. As the literature on narrative messages has matured, the criteria from this meta-analysis has been called into question, as the inclusion criteria categorized messages as "quantitative" (i.e., statistical) or "non-quantitative" (i.e., narrative) information. More recent studies have produced results that challenge the meta-analytical findings. For example, Greene, Campo, and Banerjee (2010) found both social normative and anecdotal (narrative) messages to outperform statistical messages in discouraging tanning bed use. Conflicting responses to the "which is best" question have redirected scholarly efforts toward more productive questions about the nuances of message features and unique effects that result from differing message strategies.

Narrative Features, Effects, and Audiences

As the literature discussed above outlines, initial efforts to investigate the function of narratives in health have followed several focused paths. First, narrative scholars have critically analyzed constructions of health, such as the ways health providers construct and use narratives to recount symptoms and present diagnoses and treatments to patients in interpersonal health communication settings. Second, narrative scholars have investigated the ways health messages are interpreted and given meaning, for example, as patients participate in the construction of narratives about their own health and treatment decision-making. A patient may confirm a provider's initial narrative or challenge it with an alternative story. Because of the innate appeal of narratives about health and the common usage of narratives to structure interpersonal communication about health, it makes sense that such a form of communication could translate into an effective way to reach audiences through larger-scale communicative efforts, such as public health campaigns.

As scholars have tested the question of "narratives versus didactic messages" (as illustrated through the examples mentioned above), this body of literature has produced mixed and often conflicting results about the efficacy of these two broad categories of message approaches. In response, Hinyard and Kreuter (2007) suggest that the question of *which is better* ought to be replaced with more fruitful inquiries of *when,* or *in what context*, are each of these persuasive communication approaches most appropriate for the goal at hand, *what elements* enable a narrative to persuade, and *what effects* do they produce. These questions have opened the door for a recent influx of studies examining narrative message design features and social psychological characteristics driving

individual processing of narrative information.

In entertainment research, narratives have often been studied in terms of the outcomes they produce. These outcomes are primarily focused on behavior changes, as well as shifts in beliefs, attitudes, and behavioral intentions. Entertainment researchers have studied the narrative effects of popular mass media programming, as well as more targeted health campaigns, and have provided support for the role of narratives in shifting outcomes in a variety of health contexts. For example, Morgan, Movius, and Cody (2009) found narratives to operate as powerful persuasive devices for promoting organ donation in plotlines of popular medical dramas. Additionally, Slater (2002) describes how entertainment-educational (E-E) programming provides opportunities for intentionally delivering health messages to large audiences through more implicit messages embedded in mass media content ranging from comic books to television dramas. Successful E-E programming captivates audiences with entertaining stories, with the effect that messages are absorbed with minimal resistance (Slater & Rouner, 2002).

Narratives have demonstrated several different promising effects, or outcomes, toward the promotion of healthful behaviors. Health narrative scholars have identified four primary functions or capabilities of narratives: overcoming resistance, facilitating information processing, providing surrogate social connections, and addressing emotional and existential issues (Kreuter et al., 2007). Building on these findings, the National Cancer Institute (NCI) Working Group on Narrative Communication in Cancer Prevention and Control has proposed specific questions future researchers should consider in regards to the study of narrative cancer communication (Kreuter et al., 2007). In particular, this leading group of scholars emphasizes that narratives show promise as a

way to help overcome initial resistance to cancer prevention behaviors. However, the group has stated that additional research is crucial to explicate the narrative – message resistance relationship, noting that, "too little is known about exactly what aspects of narrative messages might make them more valuable for addressing one or another barrier" (Kreuter et al., 2007, p. 224).

In addition to decreasing message resistance, narratives show promise in lessening barriers to health behaviors. A handful of studies have attempted to identify narrative message features that reduce barriers to prevention activities. For example, Anderson (2000) found characters who demonstrated prevention behaviors were effective in boosting perceived self-efficacy to perform breast self-examinations, suggesting that the modeling component of a narrative may be one mechanism through which narratives work. However, the majority of studies of health narrative studies have focused on the effects of narratives, rather than the features of narrative messages themselves. As a result, many of the past efforts to test the efficacy of health narratives have often relied on creative writers to develop narratives thought to be inherently "good stories" (e.g., Hartling, Scott, Pandya, Johnson, Bishop, & Klassen, 2010) and/or relied on real examples of patient stories as outlines for narrative messages. While some of these narratives are ultimately effective, they do not reveal the underlying strengths and weaknesses of the message features.

Narrative Features

Arguably then, a productive and theoretically-grounded direction for narrative-based communication research should attempt to define various message features that are

likely to be present in the narrative context of interest. The working definition of narrative that I utilize highlights five specific categories of narrative communication features that future research can and should explore (sequences, characters, structures, space/time, and message production). Specifically, Kreuter et al. (2007) note

> Some of these attributes have been tested in message effectiveness research, but few have been tested in the context of narrative communication specifically. Evidence of how they work in narrative compared to non-narrative messages is limited. Even more limited is empirical evidence of how these elements work independently versus in combination to produce desired health outcomes. (p. 229)

The feature-based definition provides a solid conceptual foundation on which to base my doctoral research project for several reasons. First, it will align my work with that of established narrative health communication scholars, as the NCI's working group on narratives and cancer communication has promoted this definition. Moreover, this definition transfers well into a rigorous study design, as it suggests several types of message features that can be manipulated in experimental conditions.

Characters are a key feature of narratives in need of additional empirical investigation. Narrative campaigns are often targeted toward noncompliant individuals to get them to engage in a health behavior such as cancer screening. Research on the role of narratives in cancer communication has shown that stories perceived to be more realistic are generally more effective (Green, 2006). A study following this line of thought might ask what sorts of characters are perceived as most realistic and resonate the most with audiences. For instance, does the audience relate best to "ideal" individuals who tend to screen and engage in other healthy behaviors or to stories with "similar others" (i.e., "noncompliant" characters who generally avoid such tasks)?

Additionally, narrative research should go beyond the characters to investigate

how modeling operates through the characteristics of the storyline itself. Stories may incorporate different narrative structures, or storylines, such as whether the story addresses barriers to screen or whether a character ultimately complies with the suggested health behavior or not. Narratives have been associated with increased perceptions of health risks (Dillard, Fagerlin, Dal Cin, Zikmund-Fisher, & Ubel, 2010), and it is possible that different variation of a narrative might shape such perceptions to differing degrees. Two possible variations of a narrative could alternately convey a story of failure to overcome a barrier to screen or a story about success in obtaining a cancer screening. It follows that researchers might draw from framing theories in testing message frames to see if compliant or noncompliant narrative plots produce more desirable outcomes (such as intentions and behaviors) in an audience for specific health issues such as cervical cancer prevention.

Dillard and colleagues (2010) provide a more nuanced example of how an empirical study might test a theoretically-driven narrative structure. The study examined how narrative messages contributed to intentions to screen for colon cancer by reducing perceived barriers to screen. The team found that narratives structured according to affective forecasting theory were effective in mitigating barrier perceptions among participants. Dillard et al. (2010) concluded, "More studies that systematically explore the effects of narratives including those that use experimental paradigms and develop narratives according to theoretical predictions are needed" (p. 51).

In the context of cancer control, a key narrative message feature may be whether the main character dies. Narratives about death – referred to henceforth as "death narratives" – convey a story in which a character or characters perish. For example, a

successful colorectal cancer screening campaign conducted in the state of Utah told the

story of Doug Miller, a well-known local Salt Lake City news reporter who lost his battle

with colorectal cancer in 2006 after failing to screen at the recommended age of 50.

Death is a good example of a narrative message feature as the communicator chooses to

tell a story in which a character dies, presumably because that aspect of the narrative is

thought to make a story compelling, and thus have an impact on the audience. Consistent

with this idea, a recent message experiment found that narratives foreshadowing and

containing the death of a main character increased intentions to engage in monthly skin

self-exams compared to narratives in which the main characters lived (Jensen, Yale,

Krakow, John & King, under review). Contextualizing this narrative message feature

within a larger theoretical framework, and explicating the mechanism of effect, are both

discussed in the next section.

Promising Theoretical Frameworks for Narrative Persuasion

Health communicators know that despite one's best efforts, many didactic

messages fail to achieve desired behavioral changes. However, identifying the source of

message failure presents a daunting task in effects-driven research. Effects-driven

research is effective in showcasing that a message feature *does* work, but not *how* it

works (or fails to work). O'Keefe (2003) argues that research focused on message effects,

rather than intrinsic message features, can impede the development of theory about the

mechanisms through which message features successfully persuade or fail to do so

(O'Keefe, 2003). When variables such as message features are defined according to the

effects they produce, researchers miss an opportunity to understand the processes through

which messages operate.

Perhaps the least studied and potentially most compelling aspects of persuasive storytelling are the underlying mechanisms driving effective encounters between individual message recipients and health narratives. The "how" of how a message produces an effect is often referred to as a mechanism, or within the world of statistical modeling, as a mediating variable (Slater & Gleason, 2012). Often, mediating variables are incorporated into studies as manipulation checks of message feature variations. However, O'Keefe notes that this approach overlooks the utility of such variables as explanatory processes that can be theorized to explain the relationships between features and effects. More fruitful for extending communication theory are approaches that define the intrinsic features of messages and theorize the mediating processes that drive message effects as features are varied (O'Keefe, 2003).

A looming question for health communication scholars is how narrative persuasion studies can connect to and extend theoretical frameworks of health communication that model pathways of psychological message processing. Hinyard and Kreuter (2007) note that traditional theories of health behavior change, such as the Elaboration Likelihood Model (Petty & Cacioppo, 1986) and the Heuristic Systematic Model (Chaiken, Liberman, & Eagly, 1989), emphasize psychological processes typically associated with didactic message processing. When a narrative is effective, an individual is deeply engaged in the story and his or her capacity for mental processing is centrally focused on the story's unfolding events (Green & Brock, 2000). Thus, in their current states, these persuasion theories are not sufficient in explaining how narrative-based messages are processed when cognitive assessments of elements, such as argument

salience or evaluations of argument quality, are tempered by engagement with a story (Bilandzic & Busselle, 2013).

Narratives appear to function in theoretically and cognitively different ways from didactic messages. Therefore, theories generated to explain didactic message processing tend to fall short in providing sufficient explanatory descriptions of the mechanisms through which narrative messages may achieve persuasive ends. While didactic messages typically frame information as facts, empirical truths, and rationally-structured arguments, narratives rely on deep engagement with the audience and the generation of mental imagery to help make sense of the information being presented. Japp, Harter, and Beck (2005) describe this process as a "co-construction" of a story and a collaboration between message designer and message recipient, claiming that, "[s]tories do not merely present themselves to us. We actively construct important aspects of narratives" (p. 13). The sense-making process that occurs during interaction with a story-based message requires active engagement on behalf of the message recipient, and in this sense, narratives are theoretically incomplete until they are engaged by the audience.

Despite the limitations of these persuasion theories, some existing theoretical tools can help shed light on how narrative persuasion works and point in productive directions for more theory development. One basic and well-established framework through which narratives appear to operate is Bandura's (1971) social cognitive theory. This theoretical lens has guided the developed of much entertainment education programming, which incorporates persuasive information about healthy behaviors and other topics into entertaining programming. The social cognitive theory approach suggests that narratives operate by modeling behaviors and providing vicarious learning

experiences (Slater & Rouner, 2002). *Sesame Street* is one popular example of this programming approach, which incorporates a variety of prosocial messages into highly entertaining children's programming. However, this theoretical framework focuses resulting research primarily on message effects, rather than mechanisms that mediate the message-behavior relationship. Additionally, Slater and Rouner (2002) have argued that applications of social cognitive theory in early narrative persuasion research were necessary steps, yet not sufficient in accounting for the complex processing of narrative-based messages.

Emerging findings from narrative research appear to connect well with other elements of existing persuasion and health communication theories. Narrative persuasion scholars have recently begun to work toward theories that specifically address the psychological mechanisms driving engagement with and processing of narrative information. Much of this work has focused on the role of narrative involvement. Put another way, research suggests that the degree to which a person becomes involved or engaged in a narrative will influence the degree to which a narrative is persuasive for that individual. Forms of involvement include processes such as identification with characters (Cohen, 2001), transportation into a story (Green & Brock, 2000), and the degree to which a story is deemed believable (Yale, 2013). For example, Cohen (2001) proposed identification as a central process through which audiences engage with narrative messages. This perspective moves message recipients out of a passive "spectator" role and into active roles as interpreters. These forms of involvement are conceptualized as more active psychological processes, or mechanisms in which "audience members experience reception and interpretation of the text from the inside, as if the events were

happening to them" (Cohen, 2001, p. 246).

Cohen (2001) argued that because of this active participation, narratives may effectively solicit greater involvement than non-narratives, and some narrative elements should be more successful in eliciting audience engagement than others. These forms of narrative involvement are significant processes for persuasion researchers because they can potentially work to override one's tendency to hold onto a singular perspective of an issue, such as whether to engage in a health behavior. Instead, narrative involvement processes allow the audience to engage in other perspectives through the eyes of the characters in the narrative with whom he or she identifies or to become deeply absorbed into a story. In this way, narratives allow the audience to safely experience alternative courses of action without directly contradicting pre-existing attitudes and beliefs. The discovery of underlying mechanisms driving narrative persuasion has led to the emergence of narrative-specific social psychological and persuasion-oriented theories.

Transportation Imagery Theory

One of the more prominent frameworks attempting to uncover the psychological processes underlying such narrative effects draws from the study of literary transportation. In communication, these efforts are led by scholars such as Melanie Green (Green, 2006; Green & Brock, 2002). This work explores the ways that audiences engage in transporting experiences that "carry them away" into a story, effectively reducing the ability to argue against health messages. Transportation imagery theory investigates both transportation (a state in which one is transported by a specific story) and transportability (a trait or quality denoting a general tendency to be carried away by stories) as individual

differences that may explain in part how narratives engage and influence message recipients. Specifically, transportation imagery theory posits that the experience of transportation is a process specific to narrative-based messages and is a qualitatively different cognitive process from mechanisms through which didactic, argument-based messages persuade (Green, 2006).

Green (2006) suggests three possible means through which the transporting effect of stories may persuade. She argues that transportation serves to foster connections with story characters, reduce counterarguing by the receiver, and make stories seem like real experiences to various degrees for individual narrative message recipients (increased realism). In this model, transportation is hypothesized as the central mechanism mediating the relationship between narrative messages and behavioral outcomes (Figure 1). Although the mediating pathways are clearly articulated by this model, the Transportation Imagery approach falls short of a comprehensive persuasion theory. The model only emphasizes one dominant pathway and does not incorporate other theorized predictors of narrative effects.

The Story Model

The Story Model also depicts a central mechanism through which narrative persuasion may occur. In its original form, this model aimed to predict whether a legal narrative would be accepted or rejected by jurors (Pennington & Hastie, 1992). The model was initially developed to explain how jurors generate and evaluate stories from the evidence presented in court. As the model has developed, applications of the model have been extended into contexts beyond the courtroom, and it has proven useful as a

model for evaluating pre-existing stories presented to audiences.

The model posits that the structure of stories plays an essential role in an audience's comprehension and evaluation of information. Specifically, several facets of stories, termed certainty principles, are posited as mechanisms mediating narratives and story-driven outcomes: story coverage, coherence, and uniqueness (Figure 2). Story coverage is the degree to which a story accounts for the evidence presented. A story in which an outcome leaves some events unaccounted for would be low in coverage. Coherence consists of three elements: consistency (lack of internal contradictions), plausibility (correspondence with the audience's real world knowledge), and completeness (a story contains all parts necessary to support logical inferences). In other words, a coherent story should present all of the elements needed to logically support the sequence of events and should align with the audience's real world expectations. Finally, uniqueness describes a story's ability to uniquely explain its components, and to do so more convincingly then possible competing explanations of the events at hand. The model argues that as coverage, coherence, and uniqueness increase, story-influenced outcomes should increase.

The first four principles have collectively been referred to as narrative believability and have shown promise when operationalized as such (Yale, 2013). Yale (2013) recently developed the narrative believability scale, in which coverage, consistency, plausibility, and completeness comprise four underlying components through which a story's believability is evaluated. Recent applications of the story model have determined its utility in positively predicting narrative believability, which in turn drives story-consistent outcomes, such as narrative acceptance, over and above other

theorized narrative persuasion mechanisms, such as transportation (Yale, 2013).

The Role of Message Resistance

Although the goal of persuasive messages is to influence attitudes, intentions, and behaviors, theory can also help explain why persuasive appeals may fail to induce the desired behavioral changes in audiences. Resistance to messages has long been a "white whale" for persuasion scholars (Moyer-Guse & Nabi, 2010). Research on resistance, and more specifically reactance, to persuasive messages has identified a number of reasons why recipients may actively reject, or even fight against a message, such as the formation of counterarguments or low levels of perceived vulnerability to the issue (Moyer-Guse, 2008). Early research reveals that narratives hold promise to mitigate resistance to persuasive messages. Moyer-Guse and Nabi (2010) studied the power of narratives to counter such resistance in the context of entertainment-education television programming, and this line of research has begun to uncover some of the underlying mechanisms through which narratives appear to work around message resistance.

Building upon persuasive theories such as the Extended Elaboration Likelihood Model, Moyer-Guse's (2008) Entertainment Overcoming Resistance model (EORM) suggests that various forms of narrative involvement (such as transportation, identification, and parasocial action) each reduce specific types of message resistance, such as reactance, counterarguing, and perceived susceptibility. The EORM posits that increased involvement in a narrative will reduce forms of message resistance. In turn, as resistance decreases, story-consistent attitudes and behaviors should increase (Moyer-Guse, 2008).

Other scholars have also taken up the "overcoming resistance" approach to the study of narrative mechanisms. For example, one way that well-constructed narratives may effectively convey health information by reducing counterarguments is through reduction of bias processing (Dal Cin, Zanna, & Fong, 2004). However, these authors note that the mechanisms are still largely unknown and untested by narrative persuasion scholars.

Ultimately, applications of resistance in narrative persuasion face several limitations. First, existing models are unclear in indicating the relationship between narrative message features and forms of narrative involvement. For example, narrative involvement is presented upstream in the EORM model, as story features or components of the narratives themselves (Moyer-Guse, & Nabi, 2010), rather than as mediating processes resulting from independent message components. This presentation is inconsistent with other theoretical explanations of narrative processing. To date, the EORM has not been fully tested (as noted by Moyer-Guse & Nabi, 2010). However, early empirical applications of the model have begun to suggest specific relationships between various forms of narrative involvement and forms of overcoming resistance (such as perceived persuasive intent and reactance, transportation and counterarguing, and identification and perceived vulnerability).

Interestingly, early results suggest these relationships may at times be inconsistent with other theorized explanations of narrative persuasion. For example, Moyer-Guse and Nabi (2010) found transportation to increase counterarguing, rather than reduce arguments as hypothesized. One possible explanation for this inconsistency is the conceptual distinction between education entertainment formats and other forms of

narrative messages, generating debate over whether models of message resistance can or should be applied in other narrative contexts not intended to serve as entertainment media (such as public health messages).

Still, resistance and reactance may offer a key part to explaining why a narrative fails achieve persuasive ends. Hence, narrative persuasion scholars should consider how key resistance-oriented constructs might be combined with existing models of persuasion. Of the theorized processes through which resistance may be overcome, counterarguing appears the most potent. However, as Moyer-Guse and Nabi (2010) note, instruments for measuring counterarguing are in need of further development, and exactly just what counterarguments consist of may remain unclear in closed-ended measures. Additionally, findings suggest that not only is there a need to examine downstream variables, such as counterarguing, but to also turn attention upstream to the narrative features that drive these processes from the start and to examine these relationships more comprehensively.

The Health Belief Model

In addition to theorized mechanisms of narrative persuasion, additional constructs from behavioral health models also hold promise in explaining the inner workings of narrative processing. For example, as discussed at the end of Chapter Two, Hopfner found that video narratives influenced college students' intentions to obtain the HPV vaccine by addressing barriers and increasing self-efficacy for the target behavior. As suggested by Hopfner (2012) and other scholars on HPV vaccination messages, narrative mechanisms for this health context align with the logic of health promotion models such as Rosenstock's (1988) Health Belief Model (Figure 3). These connections are

promising, but also call for more studies to help build out and/or adapt current theoretical models into more extensive representations of narrative message processes.

Narrative Persuasion Theory Testing and Development

Ultimately, each of these theoretical frameworks and models identifies one or more mediating processes through which narrative messages may induce persuasive effects in audience attitudes, beliefs, intentions, and/or behaviors. However, these models currently remain disconnected and incomplete in addressing the need for a cohesive theory of narrative persuasion. Needed is a more comprehensive model that integrates these isolated constructs into a more complex theory of narrative message features and psychological processes (see Figure 4).

The current study will manipulate two narrative message features in order to test the individual models, propose an integrated model of narrative persuasion, and explore whether components from the Health Belief Model may enhance the predictive power of the integrated model. Put another way, this study examines how narratives influence narrative processing and behavioral outcomes and how some narrative features may moderate the effects of others. Additionally, the study investigates how existing, discrete models of persuasion and behavior change may work together to more thoroughly explain the processes or mechanisms through which stories influence audiences toward healthy behaviors. To this end, the current project posits process-oriented variables as potential parallel mediators to explore whether these approaches may be effectively combined into a parsimonious and comprehensive moderated mediation model of narrative persuasion.

The Present Study: Death Narratives, HPV,

and Narrative Persuasion Theory

The current study will examine the mediating processes through which two narrative message features are proposed to influence young women's HPV vaccination behaviors (H1a–c). More specifically, the study will manipulate story outcomes as *survival narratives* in which the central character lives or as *death narratives* in which the character is foreshadowed to die and passes away at the story's end (Feature 1). Additionally, the study manipulates narrative barriers presented as obstacles characters encounter to the health behavior, in which the character faces a *social* or *structural barrier* to obtaining the HPV vaccine (Feature 2). The first set of hypotheses presents anticipated direct effects of these features on behavioral intention.

- H1a: Death narratives will increase HPV vaccination intentions more than survival narratives.

- H1b: Stories featuring social barriers will increase HPV vaccination intentions more than stories featuring structural barriers.

- H1c: Barriers will moderate the direct effect of narrative outcomes on HPV vaccination intentions.

As research sheds light on promising narrative features, new questions about the mechanisms through which these features achieve persuasive ends emerge. A new and important question in cancer prevention narratives asks what is it about inclusion of a character's death that seems to increase the persuasive effect of a message? For example, it is possible that death is a message feature that enhances one's engagement in the story or activates behavioral processes from the Health Belief model. Foreshadowing a

character's death may serve to magnify the perceived susceptibility and severity of a health threat, and in turn, peak threat drives intentions and subsequently, prevention behaviors. On the other hand, the effects of such a feature might be best explained by narrative processing constructs such as transportation or believability, such that inclusion of a character's death increases absorption into the story or makes the story feel more complete or plausible for the reader.

These questions point toward the utility of generating process-oriented models that illuminate the cognitive mechanisms through which features can drive narrative effects. To this end, the present study examines the impact of message features on mediating narrative and health communication processes, and in turn, the ability of these processes to drive health behaviors.

Testing Process Models of Narrative Persuasion

The development of narrative persuasion theory can and should occur through several possible routes for theory testing. First, research should clearly identify and test mediating pathways through which narrative persuasion constructs are theorized to operate (O'Keefe, 2003). Because no comprehensive theory has yet to unify the isolated variables identified in each model, a first logical step for theory testing is to examine the comparative ability of individual models in predicting one or more outcomes. This step allows the researcher to compare the process-oriented model with traditional models of behavior change, such as the Health Belief Model. In other words, such tests can help to identify the predictive power narrative models can lend above and beyond the constructs already identified in the health communication literature.

To this end, the current study first examines the ability of existing narrative persuasion models to predict HPV vaccination behavior in young adult women. The ability of each of the theorized processes to positively mediate the effect of narrative features on behavioral outcomes will be tested in the narrative and health communication models that have been articulated in this chapter.

Hypotheses for the Transportation Imagery Model (H2a–c, Figure 5) posit narrative transportation as a mediator of the message-outcome relationship.

- H2a: Death narratives will increase transportation more than living narratives.

    H2b: Narrative barriers will moderate the effect of life/death narratives on

    transportation.

- H2c: As transportation increases, HPV vaccination intentions will increase.

    The Story Model (H3a–o, Figure 6) is a second narrative-focused process model, which posits four narrative believability constructs as mediators.

- H3a–e: Death narratives will increase coverage, consistency, plausibility, and

    completeness more than living narratives.

- H3f–j: Narrative barriers will moderate the effect of life/death narratives on

    coverage, consistency, plausibility, and completeness.

- H3k–o: As coverage, consistency, plausibility, and completeness increase, HPV

    vaccination behavior will increase.

    The present study also examines two components drawn from entertainment research on message resistance (H4a–b, Figure 7). Here, two processes of message resistance, counterarguing and reactance, are positioned as mediators.

- H4a: Counterarguing will mediate, such that as messages that as messages reduce

counterarguing, intentions to vaccinate will increase.

H4b: Reactance will mediate, such that as messages reduce reactance, intentions to vaccinate will increase.

An additional model examines the role of behavioral health constructs drawn from The Health Belief Model (H5a–r, Figure 8).

- H5a–f: Death narratives will increase perceived susceptibility, severity, perceived efficacy, perceived benefits, and cues to action and decrease barriers more than survival narratives.

- H5g–l: As perceived susceptibility, severity, perceived efficacy, perceived benefits, and cues to action increase and perceived barriers decrease, HPV vaccination intentions will increase.

- H5m–r: Narrative barriers will moderate the effect of narrative outcome on perceived susceptibility, severity, perceived efficacy, perceived benefits and barriers, and cues to action.

Each of these models provides a theoretical basis for predicting how narrative messages may influence HPV vaccination behavior. The goal of these hypotheses is to examine which mechanisms are most potent in predicting behavioral outcomes, if these models can be integrated into a combined model of narrative persuasion, and whether the addition of behavioral variables from the Health Belief Model increase the explanatory power of the model (H6).

Testing an Integrated Model of Narrative Persuasion

Next, the study seeks to examine whether the existing models of narrative processes and message resistance constructs can be effectively combined into a more comprehensive, integrated model. That is, the integrated model investigates the combined predictive power of the mediating processes suggested by all three narrative persuasion approaches.

The study also seeks to examine whether any variables in the Health Belief Model may increase the predictive power of the model. To this end, variables of the HBM that significantly predict HPV vaccination behavior in the previous modeling testing segment will be added to the integrated model. A concern in process-driven models is the complexity and uncertainty of variable ordering. Applications of the Health Belief Model have highlighted the challenges of translating theoretical relationships among constructs into testable models (Jensen et al., under review). For example, does perceived susceptibility to a threat result in narrative transportation, or is it more likely that increased transportation heightens threat perception? Despite this complexity, creation of a coherent model necessitates an initial set of hypotheses about how narrative persuasion and health belief variables work in conjunction. The focus of this study is on the central role of these processes in persuasion and therefore, the initial variable ordering proposes a simple parallel mediation arrangement of these variables (Figure 9).

- H6: The integrated model of narrative persuasion will predict more variance in HPV vaccination behavior than each of the models alone.

- RQ1: What, if any, variables from the Health Belief Model can increase the predictive power of the Integrated Model of Narrative Persuasion?

Procedures for collecting data to test these research questions and hypotheses are outlined in Chapter Four. The applied statistical methods engaged to analyze the data and the results of these tests are presented in Chapter Five. The implications of the study results are then discussed in Chapter Six.
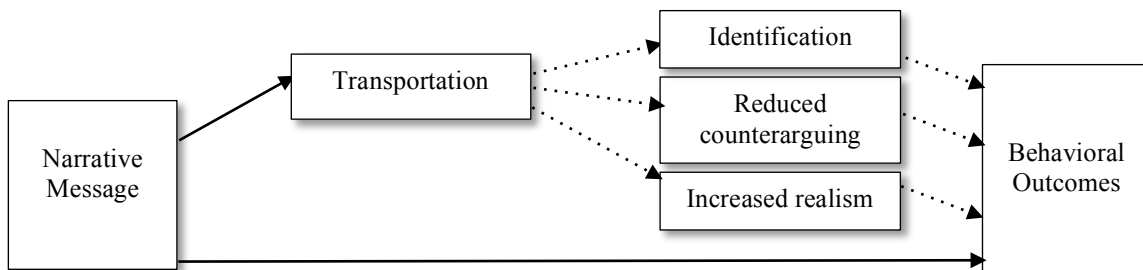
Figure 1. The Transportation Imagery Model

Note: Identification, reduced counterarguing, and increased realism are represented by dotted lines, as these pathways are included in Green's conceptual model, but often not included in empirical tests of transportation.
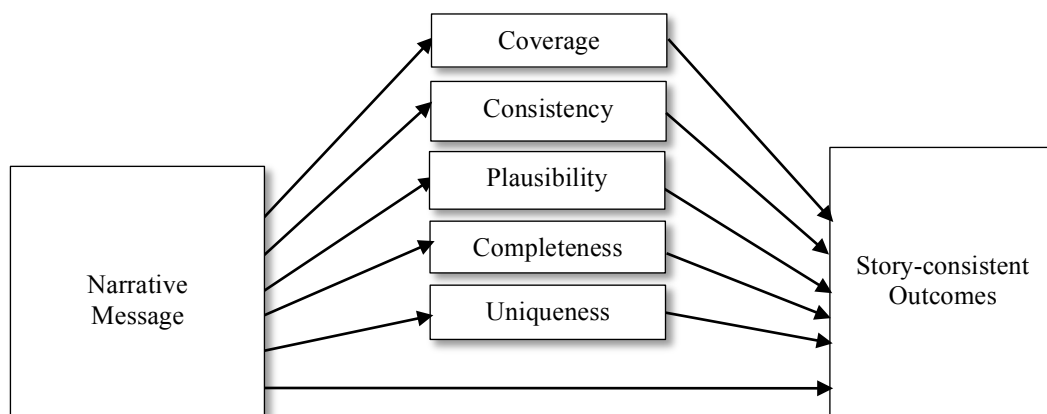
Figure 2. The Story Model

Note: The conceptual model of the Story Model is presented here. Yale's (2013) narrative
believability scale operationalizes this model into four dimensions: coverage,
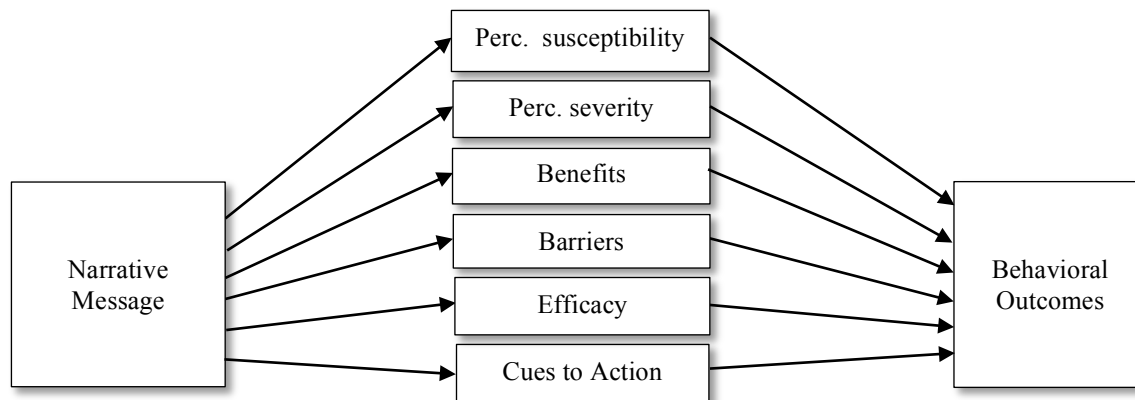consistency, plausibility, and completeness.

Figure 3. The Health Belief Model

Note: The Health Belief Model consists of two threat perceptions (perceived susceptibility to a threat to one's health, and perceived severity of that threat) and evaluations of the health behavior in responses (perceived benefits and barriers of the behavior and perceived self-efficacy to engage in the behavior), as well as environmental cues to action.
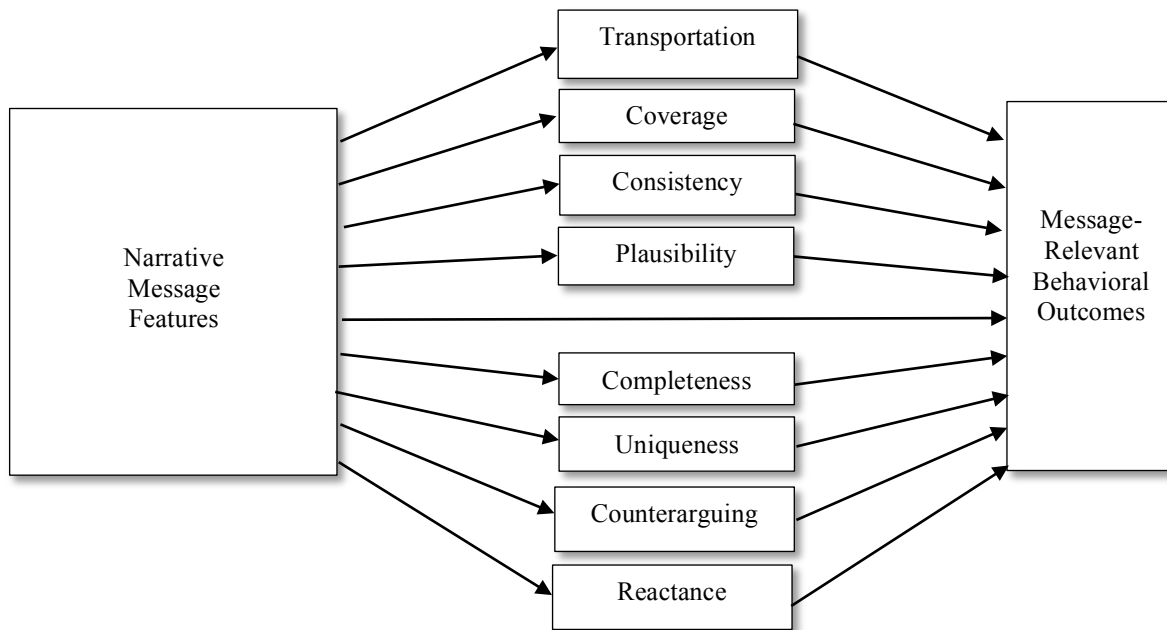
Figure 4. Integrated Model of Narrative Persuasion

Note: The above figure is a theoretical presentation of the Integrated Model, in which narrative processes are positioned in parallel as mediators of the message-behavioral outcome relationship.

Figure 5. Hypothesized Pathways in the Transportation Imagery Model

Note: This figure represents hypotheses H2a–c.
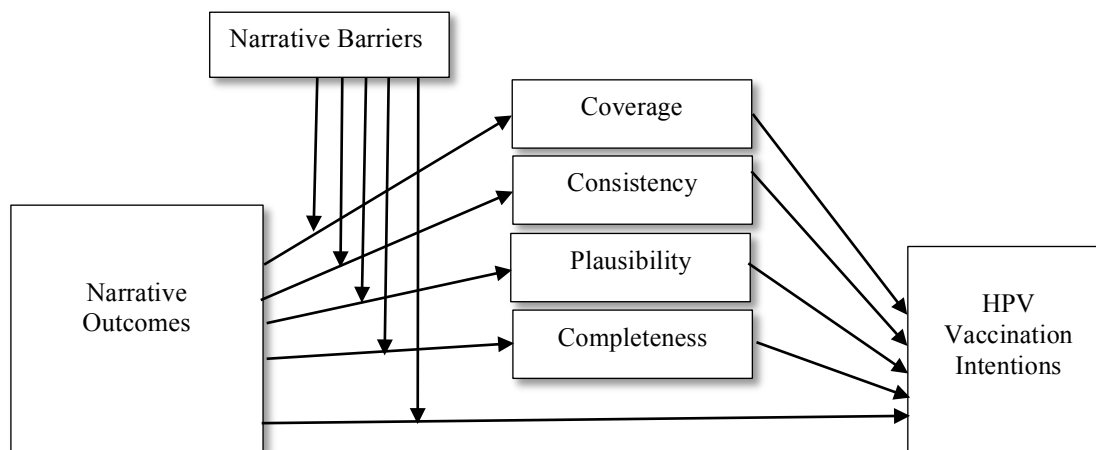
Figure 6. Hypothesized Pathways of Narrative Believability

Note: This figure represents hypotheses H3a–o.
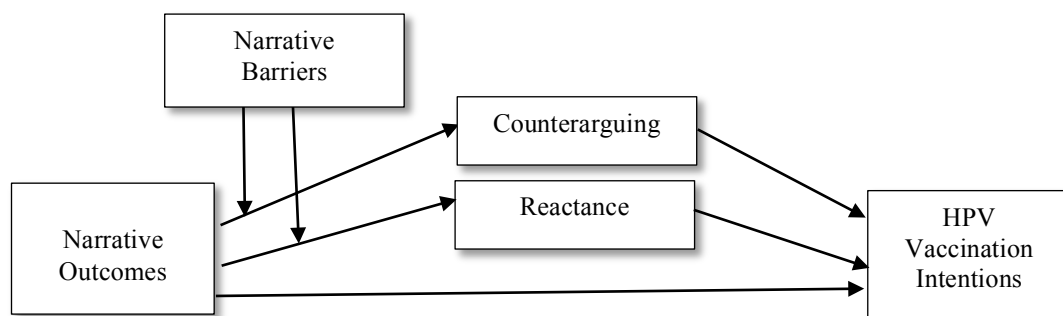
Figure 7. Hypothesized Pathways of Message Resistance

Note: This figure represents hypotheses H4a–b, in which message resistance processes are positioned as mediators of the message–intention relationship.
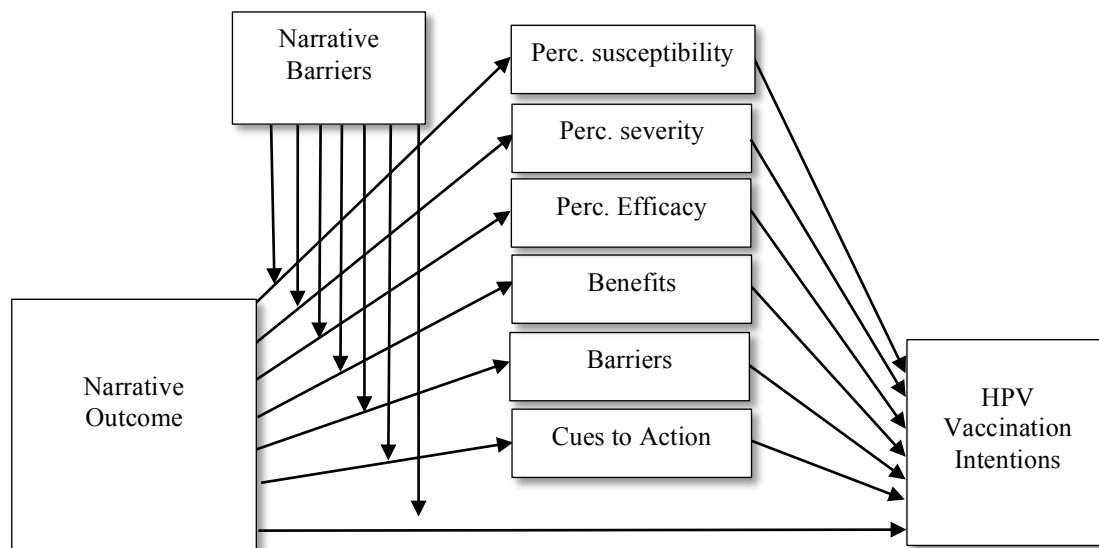
Figure 8. Hypothesized Pathways in the Health Belief Model

Note: This figure represents hypotheses H5a–r, which address each construct of
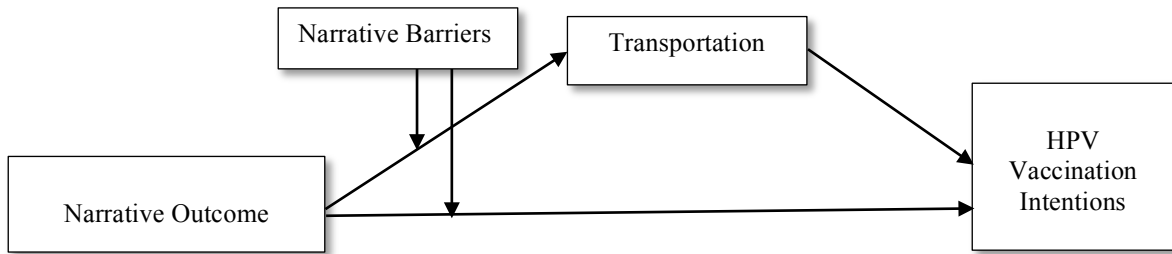the Health Belief Model as a potential parallel mediator of the message features–
intentions relationship.
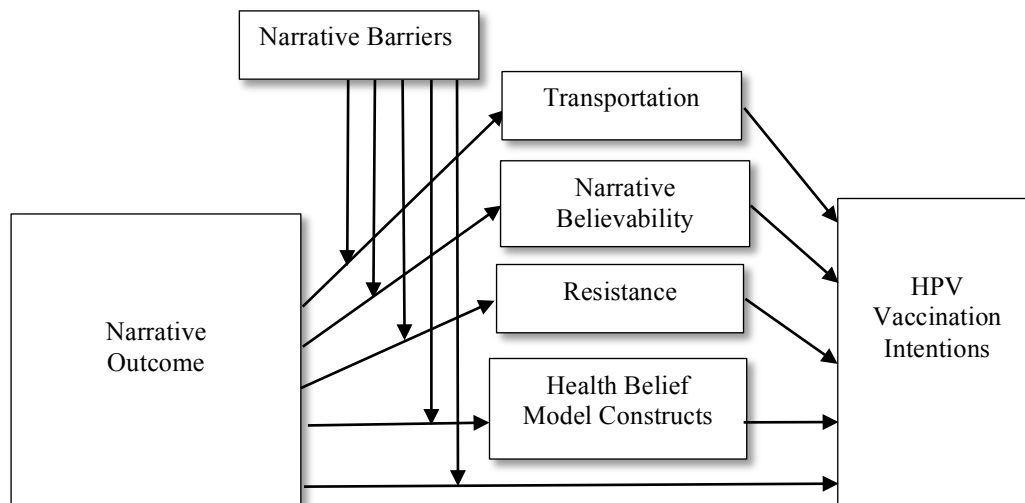
Figure 9. The Integrated Model of Narrative Persuasion with Health Belief Constructs

Note: In this iteration of the Integrated Model, health belief variables are incorporated as additional parallel mediators of the message–intention relationship. Combined, these pathways represent H6 and RQ1.

CHAPTER FOUR

METHOD

A central question for persuasion scholars is whether one type of message can be "more effective than another in meeting a specified objective" (Jackson, 1992, p. 2). The experiment provides an empirical approach to investigate such questions about narrative messages. First, the experimental study will utilize story elements that have shown promise in past narrative-based cancer prevention efforts. Within these messages, theoretically-identified narrative features can then be tested (Kreuter et al., 2007).

Dominant persuasion theories emphasize the degree to which individuals engage in cognitive processing of explicit message arguments as the central mechanism through which messages persuade. However, narratives operate a bit differently, as the goal of an effective narrative is to draw the reader into a story in which arguments are more subtly woven and implicitly presented (Green, 2006). Alternate theoretical frameworks (outlined in Chapter Three) have recently emerged to better explain the psychological mechanisms that are specific to narrative-driven persuasion. Thus, this study draws upon these efforts within social psychology and communication to examine the underlying mechanisms through which these features influence health behaviors surrounding HPV vaccination. An experimental study that manipulates two levels of message factors across two story variations in a 2 x 2 factorial design offers the most pragmatic design for

investigating the research questions and hypotheses outlined in the previous chapter.

Under approval from the University of Utah's Institutional Review Board, an

experimental survey was carried out to collect data for the dissertation.

Experimental Factors

The study engages an experimental approach to test the effects of narrative

features on message processing and behavioral outcomes. All participants in the

experiment received one of four narrative message types. Two versions of each narrative

type will be created, to avoid confounding effects of any details specific to individual

narratives (for example, a character's name). This will allow me to collapse narrative

conditions to first test for the general effect of narrative outcomes beyond the specifics of

any one story.

Factor 1: Narrative Outcomes

In the context of cancer control, a key narrative message feature may be whether

the main character lives or dies. Past research has examined the content and effects of

survivor or survival narratives (e.g., Kreuter et al., 2008; McQueen & Kreuter, 2010;

McQueen, Kreuter, Kalesan, & Alcaraz, 2011; Thompson & Kreuter, 2013), but little

work has explored the impact of character death. Narratives about death – referred to

henceforth as "death narratives" – convey a story in which a series of events culminates

in the loss of a central character or characters at the story's end. Consistent with this idea,

a recent message experiment found that death narratives foreshadowing the death of a

main character to melanoma increased intentions to engage in monthly skin self-exams

compared to narratives in which the main character survived the diagnosis (Jensen et al., under review). Death narratives may impact psychological processes, for instance, increasing the reader's transportation into the story (Green & Brock, 2000), or enhancing the believability of a story (Yale, 2013). For example, Green and colleagues found a story about a little girl who was brutally murdered at a mall to substantially increase narrative transportation in comparison to story about the same little girl when the story concluded happily with her laughing at bubbles (Green & Brock, 2000).

Kreuter and colleagues (2007) posit that plot development (e.g., whether events lead to a character's survival or death) may be a key attribute of a story's potential to model real world health behaviors (for example, demonstrating how to overcome a barrier to prevention behaviors) and increase a reader's self-efficacy toward the prevention behavior. Therefore, the present study examines whether cervical cancer death narratives influence narrative processes (e.g., transportation, believability) and health communication variables (e.g., perceived benefits, barriers, and self-efficacy) and intentions to get the HPV vaccine.

Narrative persuasion researchers are still exploring the narrative mechanisms through which outcome-oriented story elements such as foreshadowing death may operate. Therefore, the first factor will manipulate the type of character outcome presented in the narrative, that is, whether the character lives or dies in the story. Within this factor, I will examine two possible narrative storylines with differing health outcomes to see what type of narrative resonates more effectively with the target audience. In one story, the character will live after making a decision about whether to vaccinate against HPV. In the second version, the character will develop cervical cancer

and pass away after making the decision. This story will contain a sentence foreshadowing the character's death. Both stories present actual medical outcome possibilities. However, the goal of this manipulation is to determine if living or foreshadowed death narratives are more effective in facilitating involvement with narrative messages.

Factor 2: Behavioral Barriers

Barriers to HPV vaccination are a significant concern in efforts to improve cervical cancer prevention (Holman et al., 2014; Rambout, Tashkandi, & Tricco, 2014). Barriers may be broadly grouped into two categories – structural and social concerns. Structural barriers are individually oriented and include logistical obstacles to obtaining the vaccine, such as cost and/or lack of insurance coverage (Holman et al., 2014) and deterrents, such as discomfort associated with needles. Social barriers revolve around social perceptions of the health behavior, such as concern about perceived promiscuity associated with the vaccine (Krakow et al., 2015).

At the same time, engaging health stories often revolve around a series of events in which a character faces a challenge or dilemma to overcome. These obstacles or barriers may serve as opportunities to model health behaviors (Bandura, 2004), as characters encounter challenging circumstances, evaluate consequences, and make decisions about their health. In one such example, Dillard and colleagues found that colorectal screening narratives in which characters discussed barriers to screening decreased perceived barriers and increased intentions to screen for participants compared to comparable non-narrative information (Dillard et al., 2010).   Modeling operates

through the plot elements in the storyline itself. Different types of challenges, such as whether a character faces a structural barrier (fear of needles, inability to schedule a doctor's appointment) or a social barrier (concern about social perceptions associated with HPV) to obtaining the HPV vaccine, may affect reader involvement with a story. Therefore, the manipulation of social and structural barriers may be an influential component of narrative storylines in efforts to increase HPV vaccination.

Study Procedure

Study Design

The present study evaluates the effect of these two key message features on narrative and health communication mediators and HPV vaccination behaviors. The study utilized a 2 (narrative outcome: survival vs. death) × 2 (barriers: structural vs. social) factorial design with two message replications (Rosie's story and Jennie's story) to test the effects of the two message components.

In all, eight narratives were constructed to include the four manipulation conditions across two replications. All of the narrative conditions were comparable in reading level and word count (word count $M = 748$, range = 710–799), with readability scores indicating stories consistently comprised a late seventh to early eighth grade reading level (Flesch-Kincaid score $M = 7.9$, range = 7.5–8.1). Participants completed a survey in which they were randomly assigned to read one of eight narratives and then complete a series of narrative, health communication, and demographic questions. The study was approved and supervised by the University of Utah Institutional Review Board.

Participants

Women aged 18–26 were recruited through Amazon Mechanical Turk (MTurk) to participate in an online study over the course of 1 week. MTurk is a service run by the Amazon.com company, where users can perform small tasks posted to the website by requesters, and earn money for each task completed. Previous research has established a strong precedent for use of MTurk as a participant recruitment tool for survey and experimental research across the social sciences (Berinsky, Huber, & Lenz, 2012). Experimental research can be cost-prohibitive and time for recruitment can be lengthy. MTurk benefits researchers by offering a recruitment tool at a relatively low cost and with a relatively short implementation time (Berinsky, Huber, & Lenz, 2012**).** Additionally, in a comparative study Berinsky, Huber, and Lenz (2012) found MTurk to provide a more nationally representative study sample than convenience sampling, although MTurk results fell short of achieving the representativeness of more costly national probability samples.

In health communication, researchers have begun using MTurk as a crowdsourcing recruitment tool to test a diverse range of health-related messages, including skin cancer narratives (Jensen et al., under review), medical pictograms (Yu, Willis, Sun, & Wang, 2013), and health promoting mobile app designs (Halko & Kientz, 2010). Based on the successes of this previous research, MTurk was utilized for the current project. In the present study, individuals who participated in the survey received $0.50 and entry into a $100 lottery as compensation for their participation. Individuals who did not meet study requirements were redirected to an alternate approved study with the same compensation set up.

A total of 348 participants from 43 states and the District of Columbia completed the survey. The mean age was 23.3 years old ($SD = 2.16$ years). Three quarters of the participants were White, 9.2% were Black, 6.6% Asian, 5.2% Hispanic/Latino, 3.7% reported multiple or mixed race, and 0.3% Native American. The majority of women reported completing some college or a college degree as the highest level of education attained. More specifically, 2.3% reported completing some high school without a diploma, 11.2% reported earning a high school diploma or equivalent (e.g., a GED), 35.9% reported some college credit, 11.2% completed an associate's degree, 36.8% had a bachelor's degree, 2% had a master's degree, and 0.6% completed technical or vocational training.

Household income was measured in increments of $10,000. The mean household income among participants was between $25,000–$34,999. A total of 11.2% of the participants indicated a household income of less than $10,000, followed by $10,000–$14,999 (9.2%), $15,000–$24,999 (15.8%), $25,000–34,999 (15.8%), $35,000–49,999 (18.15), $50,000–74,999 (14.9%), $75,000–99,999 (6.9%), $100,000–149,999 (5.2%), $150,000–199,999 (2%), and $200,000 or more (0.9%). Most women in the sample (81.9%) had no children, 12.4% had one child, 4.3% had two children, and 1.4% had three children.

Of the total group of initial respondents, 246 participants had not begun or completed the HPV vaccination series. Only women in the nonvaccinated subgroup were included in the analyses, as the outcome variables assessed intentions to begin the vaccination series.

Stimuli

Participants were randomly assigned to read one of eight cervical cancer narratives. Larkey and Hecht (2010) note that stories drawn from target group are likely to contain naturally compelling elements. Therefore, two personal narratives were adapted from real stories published and publically available on the websites of two cervical cancer advocacy organizations. The researcher manipulated two key aspects of the selected stories (whether the character lived or died and whether the character faced a social or structural barrier to vaccination) in order to generate eight narrative conditions.

 The stories featured one of two main characters, Rosie or Jennie. In the narratives, each young woman experienced a cervical cancer diagnosis, underwent treatment, and opted to share their stories with other young women. Within this narrative structure, each character faced unique experiences as she battled cancer. For example, "Rosie" was a junior high health teacher and young mother who received her diagnosis at age 26. The "Jennie" story featured a young woman diagnosed with abnormal cells on her cervix at age 20 while in a relationship with her college boyfriend. Because the original stories were shared by survivors, the story endings were modified to include the character's death in half of the conditions. For example, in the narrative condition in which Rosie died, the ending was modified to read

> Rosie wanted to beat cervical cancer. She wanted to become a survivor. However, the cancer continued to spread. During this time, Rosie was so exhausted and overwhelmed, she broke down several times as she was fighting against the cancer. Rosie worked hard to overcome the mental and emotional stress of her cancer battle, and ensure that she spent as much quality time with her children and family as she could.

> As her condition worsened, Rosie realized that although she would not be able to become the survivor she wanted to be, she knew she had a story to tell and a mission to eradicate this cancer through education and HPV

awareness. Ultimately, Rosie lost her battle with cervical cancer. Toward the end of her life, she shared a message on her website to educate and encourage other young women:

"I was 25 years old when the HPV vaccine first became available for girls and women. I remember hearing about it, but I was too concerned that my friends at church would disapprove of the vaccine and think it meant I was being promiscuous. Years later, I have been through so many difficult conversations about my health and my life with my friends, and face fears much worse than someone's disapproval. I can't even believe that such a minor worry about what people would think kept me from getting an important vaccine that could have prevented my cancer. I'm grateful for the extra time my doctors and treatments have given to me, and at the same time hopeful that people will hear my story and get vaccinated against HPV so they do not have to go through what I experienced. Those three little shots could add years to your life."

Recent research has demonstrated that readers are adverse to cancer narratives that do not allude to the possibility of a main character's death. In a study of skin cancer narratives among adults, Jensen and colleagues (under review) found that stories that included a brief statement foreshadowing the possibility of death at the beginning of the narrative fared better than stories with identical endings that excluded this small statement. Following this example, an additional sentence was also added to the beginning of each foreshadowed death narrative: "Not everyone who gets cervical cancer survives." The remainder of each character's narrative was the same in both survival and death conditions. The full text of these narratives is provided in Appendix A.

Measures

For a complete list of all survey items and instruments, see Appendix B.

Controls: Sociodemographic variables. The survey included questions about age, sex, ethnicity/race, education level, household income, and prior sexual activity (whether the participant had ever had sexual intercourse).

Controls: Prior health behaviors. A series of single item measures asked participants if they have ever been vaccinated for the flu or Hepatitis B, had ever had an abnormal Pap test, had an HPV infection in the past, had genital warts, or been diagnosed with cervical, oral, or anal cancer.

Mediator: Narrative transportation. Transportation is a psychological mechanism analogous to becoming absorbed or "carried away" by a story. This process engages the reader in vivid images, emotions, and attention of a narrative. Collectively, these facets of transportation can lead narrative messages to influence individual beliefs and behaviors. The 11 general items from the narrative transportation scale are scored on a 7-point scale anchored by endpoints *not at all* and *very much* (Green & Brock, 2000) and include statements such as "I could picture myself in the scene of events described in the narrative." For this sample, scale $M = 4.83$, $SD = .86$, alpha = .737.

Mediator: Narrative believability. The narrative believability scale (NBS-12) has been shown to be a psychometrically robust measure of believability, capable of predicting narrative persuasion outcomes in the context of jury decision-making (Yale, 2013). Twelve statements are evaluated on a 7-point Likert scale. The instrument consists of four subscales of narrative believability (with 3 items per subscale): coverage ($M = 5.30$, $SD = 1.16$, $\alpha = .652$), plausibility ($M = 5.95$, $SD = 1.03$, $\alpha = .818$), consistency ($M = 5.66$, $SD = 1.13$, $\alpha = .848$), and completeness ($M = 5.97$, $SD = .99$, $\alpha = .664$). Subscale items are presented as statements, such as, "I believe this story could be true" and "The information given in this story was consistent."

Mediator: Counterarguing. Five items drawn from Nabi, Moyer-Guse, and Byrne (2007) measured counterarguments against the narrative message. Items include

statements such as "I found myself actively agreeing with the author's points" and are assessed on a 5-point scale ranging from *strongly disagree* to *strongly agree* (M = 2.09, SD = .73, α = .778)

Mediator: Reactance. Two sets of questions drawn from Dillard and Shen (2005) measured cognitive and emotional components of psychological reactance. A five-item scale measured perceived threat to participants' freedom (M = 2.15, SD = .92, α = .889), and four items measured emotional reactance (M = 2.04, SD = 1.24, α = .884). Items asked about participants' reactions to reading the narrative, including emotional responses (anger, irritation, annoyance, and aggravation, e.g., "I felt angry while reading the story") and cognitive assessments (e.g., "The story tried to force its opinions on me" and "I wanted to argue against the story as I read through it.")

Mediators: Health belief model variables. Items to measure HBM constructs were adapted from Champion's (1984) Health Belief Model Constructs Instrument and Champion's (1999) Revised Susceptibility, Benefits, and Barriers Scale to fit the context of HPV vaccination and cervical cancer prevention. Participants responded to all items on a scale from 1 to 5. Five items measured perceived risk susceptibility (M = 2.40, SD = .86, α = .74) and two items measured perceived risk severity (M = 4.38, SD = .74, α = .808). Seven items measured benefits (M= 3.44, SD = .86, α = .891), 11 measured barriers (M = 2.21, SD = .67, α = .86), and eight measured efficacy (M = 3.78, SD = .83, α = .925). All items for the HBM are included in Appendix B.

Behavioral outcomes: HPV vaccination intentions. Behavioral intention statements regarding the HPV vaccine using a 7-point (strongly agree-strongly disagree) scale were drawn from research by Carcioppolo and colleagues (2013). These items

measure intentions to talk to friends, family, and doctors, search online for information, and begin the HPV vaccination series following exposure to the message. A systematic review of educational cervical cancer interventions found that the effect of most cervical cancer campaigns is sustained up to 3 months after initial message exposure (Shepherd, Peersman, Weston, & Napuli, 2000). Intentions to talk about the vaccine with a physician have also been shown to lead to vaccination behavior, as talking with doctors often translates into a recommendation for the vaccine (Rosenthal, Weiss, Zimet, Ma, Good, & Vichnin, 2011). Consistent with these findings and with outcome measures used in related studies (e.g., Jensen, Yale, Krakow, King, & John, under review), final analyses for the present study include two statements to assess behavioral intentions related to the HPV vaccine, asking participants to rate their intention to talk to a doctor about the vaccine in the next 2 weeks ($M = 2.23$, $SD = 1.20$) and intention to begin the HPV vaccination series in the next 3 months ($M = 2.16$, $SD = 1.05$).

Subject participation in the experiment concluded after completion of the survey. Procedures for statistical analysis of the experimental data are presented in Chapter Five.

CHAPTER FIVE

ANALYSIS AND RESULTS

The current study first sought to examine the effects of two narrative message features – life and death narratives, and social and structural barriers – as well as the interaction of these features, directly on young women's intention to vaccinate for HPV in the next 3 months (H1a–c). In addition to exploration of these key message features, the study also examined whether these feature effects replicated in stories featuring the characters, Rosie and Jennie. The second goal of the study was to investigate how narratives are processed by readers. To this end, the experiment was designed to test and integrate process models in narrative persuasion and health communication. To this end, the study first tested whether theorized mechanisms in existing models mediated the narrative message–HPV vaccination intention relationship. Next, the study integrated two existing models of narrative persuasion, message resistance constructs, and key constructs from the Health Belief Model into a singular theory-driven, parallel process model. The study evaluates the potential of key mechanisms working together to see if the integrated narrative model offered explanatory power over and above the variables theorized by the Transportation Imagery Model, the Story Model, and/or the Health Belief Model individually.

These models were tested using PROCESS, a conditional modeling program for

SPSS developed by Andrew Hayes (Hayes, 2012). Model 8 in PROCESS tests moderated mediation. As the first four models depict both mediating processes as well as a moderating message feature, Model 8 is an effective and appropriate tool for this portion of the analysis. This model is a parsimonious approach that simultaneously tests the effects of two narrative features and possible mediators of the relationship between narrative messages and behavioral outcomes. Model 8 was also used to test the integrated model of narrative persuasion. Results can compare the variance explained by a combination of mediating processes to determine if the integrated model can predict vaccination above and beyond any singular theorized mechanism.

Post Hoc Power Analysis

Power is crucial consideration in experimental research, as it determines whether the study design holds the ability to reject null hypotheses and detect the presence of relationships and effects among variables. G*Power was utilized to calculate the power of the current study design to detect significant effects in analyses of covariance ($\alpha = .05$, 8 groups, 16 outcome variables, $N = 246$). Three power analyses were conducted for three standard effect sizes, small ($f^2 = .01$), medium ($f^2 = .04$), and large ($f^2 = .16$; Faul, Erdfelder, Buchner, & Lang, 2009). The design had excellent power to detect a large (.96) or medium effect (.95), but little power to detect a small effect (.36).

When a sample is not large enough to provide power to detect small effects, a researcher is in danger of committing a Type 2 error. That is, true effects present in the data may go undetected. To avoid errors of this nature, the following reported results make note of effects and relationships that approached but failed to meet standard

threshold for statistical significance (i.e., $p = .05$). P-values less than .1 are noted both in text with reported p-values provided in parentheses and in tables and figures with a small cross symbol.

Covariate Analysis

First, a three-way multivariate analysis of variance (MANOVA) was conducted to determine whether narrative outcome (survivor or death), narrative barrier (structural or social), narrative replications across two characters (Rosie or Jennie), or interactions of any of these features were related to demographic variables that could serve as potential covariates in subsequent analyses (age; race; relationship status; housing status; number of children; reported education level; household income level; past flu vaccination; past Hepatitis B vaccination; history of abnormal Pap test; history of past HPV infection; history of genital warts; history of cervical, anal, and oral cancers; having begun but not completed the HPV vaccination series; and past sexual activity).

Main Effects

A statistically significant multivariate effect was observed for narrative character, Pillais' Trace $= .131$, $F(15, 172) = 1.723$, $p = .050$, suggesting that one of the characters shaped a more effective narrative than the other. As a result, differences among the story replications featuring the two different characters were examined via univariate tests to determine how the replications differed. Multivariate tests were not significant for narrative outcome, Pillais' Trace $= .074$, $F(15, 172) = .919$, $p = .544$, or narrative barrier, Pillais' Trace $= .040$, $F(15, 172) = .480$, $p = .948$.

Univariate Tests of Message Features

Narrative outcome (survival or death) and narrative barriers (structural or social) were not significantly related to any of the dependent demographic variables. The variation in narrative character (Rosie or Jennie) was significantly related to education level, history of abnormal Pap test, and vaccination for Hepatitis B. Narrative outcome was also marginally related ($p = .052$) to prior flu vaccination. Bonferroni post hoc tests revealed that participants who read about Jennie's character had higher education levels, and an increased likelihood of a past abnormal Pap test. Those who read Rosie's story were more likely to have received a flu shot in the past, and more likely to have been vaccinated for Hepatitis B.

Message Feature Interactions

There was a significant narrative outcome × barrier interaction for income, $F(1, 194) = 6.320$, $p = .013$, past flu vaccination, $F(1, 194) = 6.520$, $p = .011$, and past sexual activity, $F(1, 194) = 3.956$, $p = .048$. Those in the foreshadowed death–social barrier narrative condition had higher household incomes ($M = 5.04$, $SD = .31$) than those in the death–structural barrier condition ($M = 4.00$, $SD = .29$). This group also reported higher rates of past flu vaccination ($M = 1.99$, $SD = .12$) than those in the death–structural barrier condition ($M = 1.63$, $SD = .13$), while those in the survivor–social group fared better in flu vaccination ($M = 1.79$, $SD = .13$) than those in the survivor–structural group ($M = 1.50$, $SD = .13$). Finally, the death–social barriers condition had a greater likelihood of having engaged in past sexual activity ($M = 1.21$, $SD = .06$) than the death–structural barriers group ($M = 1.08$, $SD = .055$).

Finally, there was one barrier × narrative character interaction for history of past HPV infection, $F(1, 194) = 4.346$, $p = .038$. Those who read Rosie's structural barriers narrative ($M = 2.84$, $SD = .08$) were more likely to have reported a past HPV infection than Jennie's structural barriers ($M = .27$, $SD = .08$), and those who read Rosie's social barriers condition were lower ($M = 2.77$, $SD = .09$) than those in Jennie's social barriers condition ($M = 2.94$, $SD = .08$).

Given these initial results, seven covariates were included in subsequent analyses: reported education level, household income level, past flu vaccination, past Hepatitis B vaccination, history of abnormal Pap test, history of past HPV infection, and past sexual activity.

Identifying Potential Mediators

H1a–H5r asked whether the two narrative message features (outcomes and barriers) or interactions among these components influenced narrative persuasion and health communication outcomes and vaccination intentions. A three-way multivariate analysis of covariance (MANCOVA), including the seven covariates, was conducted to test these questions.

Statistically significant multivariate effects were observed for narrative outcome, Pillai's Trace = .129, $F(16, 216) = 2.004$, $p = .014$, consistent with the notion that whether characters in cancer-centered stories live or die matters (Jensen et al., under review). The multivariate test neared significance for narrative character, Pillai's Trace = .107, $F(16, 216) = 1.615$, $p = .067$, consistent with results of the first analysis, suggesting that the character in the story influenced one or more outcome variables.

Tables 1–3 report the results by dependent variable. Narrative outcome was significantly related to plausibility, consistency, coverage, self-efficacy and barriers. Bonferroni post hoc tests indicated that each of these outcomes fared better when the character in the story survived (see Table 1).

Barrier condition (structural or social) was significantly related to risk susceptibility, and marginally related to intention to talk to a doctor about the vaccine ($p = 0.085$, see Table 2). Bonferroni post hoc tests revealed that structural barriers increased perceived risks susceptibility and intention to talk to a doctor.

Narrative character condition was significantly related to transportation, emotional reactance, benefits, risk susceptibility, and intention to get the HPV vaccine within the next 3 months and marginally related to perceived barriers ($p = .094$, see Table 3). Bonferroni post hoc tests indicated that Rosie's story significantly increased character identification and transportation, while Jennie's story increased emotional reactance among participants. Additionally, the message replication featuring Rosie's story produced a significant increase in perceived benefits, perceived barriers, risk susceptibility, and greater intentions to receive the HPV vaccination in the next 3 months. In sum, Rosie's story had a more persuasive narrative effect than stories featuring Jennie.

Three interactions were significant in the analysis. The narrative outcome × barrier interaction was significantly related to transportation (see Figure 10) and marginally related to plausibility ($p = 0.071$) and risk severity ($p = 0.054$; see Figure 11). In survival stories featuring social barriers, transportation, plausibility, and perceived severity increased. The narrative outcome × character interaction was significantly related to risk severity, narrative consistency, and intention to vaccinate in the next 3

months. Stories in which Jennie died were rated as less consistent. Stories in which Rosie died served to increase perceived severity, and stories in which Rosie survived resulted in increased vaccination intentions. Finally, the barriers × character interaction was significantly related to identification, transportation, plausibility, and consistency, and marginally related to completeness ($p = .068$). Across the board, stories in which Jennie faced a structural barrier to vaccination scored lower on all of these variables.

Given the significant differences between these two character versions of the stories and the interactions of these story replications with other narrative features, narrative character was included in subsequent analyses as an additional covariate. Controlling for the differences between the Rosie and Jennie versions of the stories produced following analyses, in which the natural variation across individual cervical cancer narratives was separated from the impact of the manipulated story features.

Moderated Mediation

In light of MANCOVA results linking variations in narrative components to narrative processing, health belief variables, and vaccination outcomes, moderated mediation analysis was conducted to examine whether these mechanisms explained the narrative message–health behavior relationship. Tests of moderated mediation explore whether the indirect (mediated) effects of narrative features (such as narrative outcome) on intentions to vaccinate are moderated by some additional variable, such as whether that character faces a structural or social barrier and allow for analysis of the impact of patterns of narrative features in combination on narrative processing.

Moderated mediation was tested using a conditional process modeling program,

PROCESS, that utilizes an ordinary least squares path analytical framework to test for

both direct and indirect effects (Hayes, 2012). PROCESS is ideal for analyzing the

current data because it allows researchers to explore a variety of models including

mediated and moderated pathways. All indirect effects were subjected to follow-up

bootstrap analyses with 1000 bootstrap samples and 95% bias corrected confidence

intervals.

Study hypotheses queried whether any of the theorized narrative or health

communication variables mediated the relationship between narrative messages and

vaccination intentions. To test these hypotheses, moderated mediation analysis was

conducted via PROCESS Model 8, with narrative outcome entered as the independent

variable (X), narrative barrier entered as the moderator variable (W), intention to

vaccinate in the next 3 months as the dependent variable (Y), and 10 process-oriented

variables from the three models (transportation, narrative believability, and health belief

constructs) entered as parallel mediator variables (M), and eight previously identified

covariate and message replication variables (narrative character, education, income, past

flu vaccination, past Hepatitis B vaccination, history of abnormal Pap test, history of

HPV infection, and past sexual activity) entered as controls (see Figure 12).

Narrative outcome was significantly related to transportation, $b = -.75$, $SE = .35$, $t =$

-2.13, $p = .03$, self-efficacy, $b = .66$, $SE = .29$, $t = 2.26$, $p = .02$, and marginally related to

coverage, $b = .92$, $SE = .48$, $t = 1.94$, $p = .054$. Narrative barrier was not significantly

related to any of the potential mediators. Consistent with MANCOVA findings, the

interaction of narrative outcomes and barriers was significantly related to transportation,

$b = .52$, $SE = .22$, $t = 2.36$, $p = .02$, and marginally related to plausibility, $b = .46$, $SE =$

.27, $t = 1.72$, $p = .09$, and perceived severity, $b = .36$, $SE = .19$, $t = 1.87$, $p = .06$, in the process model.

In turn, the model assessed the relationship between these mechanisms and the behavioral outcome. Intention to vaccinate in the next 3 months was positively predicted by transportation, $b = .17$, $SE = .09$, $t = 2.08$, $p = .04$, and risk susceptibility, $b = .28$, $SE = .08$, $t = 3.46$, $p < .000$, perceived severity, $b = -.23$, $SE = .09$, $t = -2.52$, $p = .-123$, and benefits, $b = .50$, $SE = .08$, $t = 5.90$, $p < .000$.

Next, indirect effects of the interaction were examined to determine if mediation successfully carried through these potential pathways. Two variables fully mediated the narrative outcome–behavioral intention relationship: transportation and risk severity. The direct effect of the narrative outcome x barrier interaction on vaccination intentions was mediated in part by transportation, $b = .1089$, bootstrapped $SE = .0661$, 95% CI: .0196, .2630 and by risk severity, $b = -.0835$, bootstrapped $SE = .0496$, 95% CI: -.2089, -.0105. To understand these relationships, the interactions were probed at two levels of the moderator (social and structural barriers). An examination of this conditional indirect effect through transportation revealed that the survival narrative featuring a social barrier generated greater transportation, which in turn increased intentions to vaccinate in the next 3 months (see Figure 10). Additionally, probing the second interaction effect revealed that survival narratives featuring social barriers increased perceived risk severity, which led to a reduction in intentions to vaccinate (see Figure 11).

Model 8 also represents an initial test of the integrated model of narrative persuasion with the addition of health belief variables. Ultimately, when core constructs from theorized models – the Transportation Imagery Model, the Story Model, and the

Health Belief Model – were combined into a more comprehensive parallel mediation process model, two key variables (transportation and risk severity) emerged as mediators of the narrative–intention relationship.

Table 1

One-Way ANOVAs with Narrative and Health Communication Constructs as Dependent Variables and Narrative Outcome as the Independent Variable

	Levene's	ANOVA	Survival	Foreshadowed Death
				M (*SD*)
	F	*F*	*M* (*SD*)	
Transportation	1.04	.09	4.84 (.88) [a]	4.81 (.85) [a]
NBS – Plausibility	1.35	6.24*	6.11 (.95) [a]	5.80 (1.08) [b]
NBS - Completeness	1.61	1.38	6.04 (.97) [a]	5.89 (1.02) [a]
NBS – Consistency	3.08**	5.21*	5.83 (1.06) [a]	5.49 (1.19) [b]
NBS – Coverage	.65	6.18*	5.49 (1.12) [a]	5.11 (1.18) [b]
Counterarguing	1.08	.08	2.10 (.77) [a]	2.08 (.70) [a]
Reactance – Threat to Freedom	2.23*	.002	2.12 (.99) [a]	2.17 (.85) [a]
Reactance - Emotional	1.66	.06	2.00 (1.24) [a]	2.09 (1.25) [a]
Self-Efficacy	1.23	9.28**	4.12 (.79) [a]	3.89 (.73) [b]
HBM Benefits	1.83†	.73	3.42 (.91) [a]	3.48 (.79) [a]
HBM Barriers	.42	8.27**	2.11 (.67) [a]	2.31 (.65) [b]
HBM Risk Susceptibility	1.67	.004	2.39 (.89) [a]	2.42 (.82) [a]
HBM Risk Severity	2.01†	.62	4.43 (.72) [a]	4.32 (.76) [a]
Intent to talk to doctor	1.62	.02	2.23 (1.26) [a]	2.25 (1.14) [a]
Intent to Vaccinate (3 mo.)	2.03†	.15	2.19 (1.14) [a]	2.14 (.97) [a]

Note. $N = 246$. Means that do not share superscripts are significantly different, $p < .05$. Superscripts should be read horizontally, not vertically.
†$p < .10$ *$p < .05$ **$p < .01$

Table 2

One-Way ANOVAs with Narrative and Health Communication Constructs as Dependent Variables and Narrative Barrier as the Independent Variable

	ANOVA F	Structural Barrier M (SD)	Social Barrier M (SD)
Transportation	.40	4.79 (.89) [a]	4.87 (.83) [a]
NBS – Plausibility	.02	5.92 (.98) [a]	5.98 (1.09) [a]
NBS - Completeness	.32	5.92 (1.01) [a]	6.01 (.98) [a]
NBS – Consistency	1.74	5.55 (1.20) [a]	5.78 (1.06) [a]
NBS – Coverage	.07	5.29 (1.16) [a]	5.30 (1.17) [a]
Counterarguing	.82	2.14 (.72) [a]	2.04 (.74) [a]
Reactance – Threat to Freedom	1.47	2.24 (.92) [a]	2.06 (.92) [a]
Reactance - Emotional	1.76	2.17 (1.27) [a]	1.92 (1.21) [a]
Self-Efficacy	.52	4.01 (.73) [a]	4.00 (.81) [a]
HBM Benefits	.25	3.45 (.88) [a]	3.45 (.82) [a]
HBM Barriers	.00	2.22 (.69) [a]	2.20 (.64) [a]
HBM Risk Susceptibility	4.61*	2.52 (.86) [a]	2.28 (.83) [b]
HBM Risk Severity	.32	4.33 (.76) [a]	4.42 (.72) [a]
Intent to talk to doctor	2.99†	2.35 (1.25) [a]	2.12 (1.13) [b]
Intent to Vaccinate (3 mo.)	.19	2.18 (1.05) [a]	2.15 (1.06) [a]

Note. N = 246. Means that do not share superscripts are significantly different, $p < .05$. Superscripts should be read horizontally, not vertically.
†$p < .10$ *$p < .05$ **$p < .01$

Table 3

One-Way ANOVAs with Narrative and Health Communication Constructs as Dependent Variables and Narrative Character as the Independent Variable

	ANOVA *F*	Rosie *M* (*SD*)	Jennie *M* (*SD*)
Transportation	4.45*	4.97 (.81) [a]	4.69 (.89) [b]
NBS – Plausibility	.12	5.98 (1.03) [a]	5.91 (1.04) [a]
NBS - Completeness	.01	5.97 (1.03) [a]	5.96 (.96) [a]
NBS – Consistency	.21	5.72 (1.10) [a]	5.60 (1.17) [a]
NBS – Coverage	.01	5.33 (1.07) [a]	5.26 (1.24) [a]
Counterarguing	.01	2.09 (.76) [a]	2.10 (.71) [a]
Reactance – Threat to Freedom	1.21	2.06 (.89) [a]	2.23 (.94) [a]
Reactance - Emotional	4.22*	1.90 (1.12) [a]	2.19 (1.34) [b]
Self-Efficacy	.01	4.00 (.68) [a]	4.01 (.85) [a]
HBM Benefits	4.90*	3.58 (.73) [a]	3.33 (.94) [b]
HBM Barriers	2.83†	2.28 (.66) [a]	2.14 (.67) [b]
HBM Risk Susceptibility	9.27**	2.58 (.81) [a]	2.23 (.86) [b]
HBM Risk Severity	.03	4.39 (.67) [a]	4.36 (.80) [a]
Intent to talk to doctor	2.50	2.37 (1.19) [a]	2.11 (1.20) [b]
Intent to Vaccinate (3 mo.)	6.42*	2.32 (1.06) [a]	2.02 (1.04) [b]

Note. $N = 246$. Means that do not share superscripts are significantly different, $p < .05$. Superscripts should be read horizontally, not vertically.
†$p < .10$ *$p < .05$ **$p < .01$
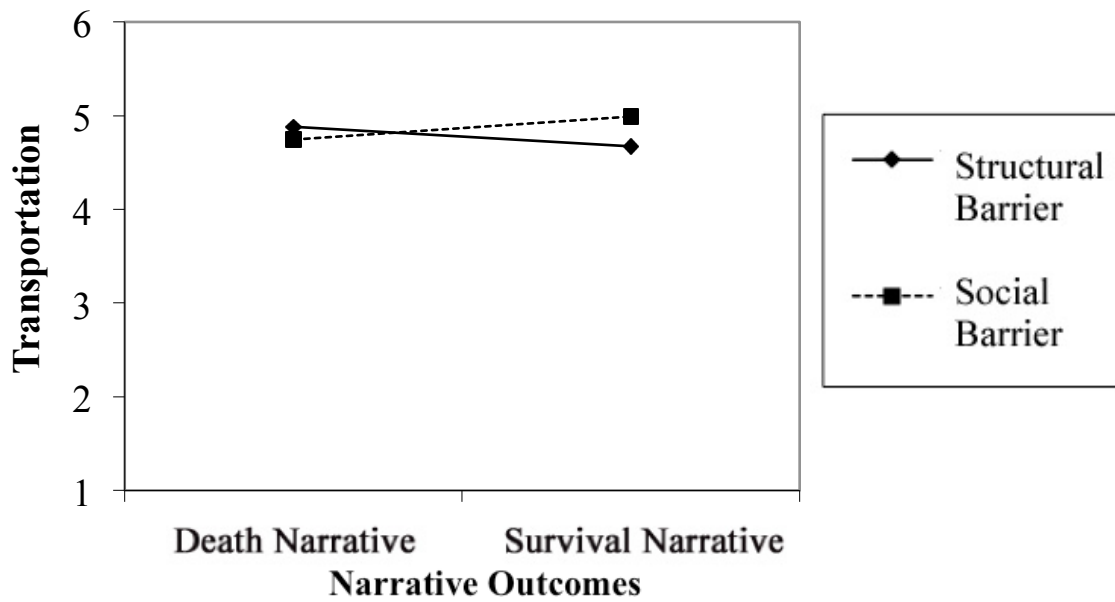
Figure 10. Interaction of Outcome and Barrier on Transportation

Note: As shown by the dotted line in the above figure, narratives featuring survival narratives paired with social barriers resulted in the greatest transportation scores among participants.
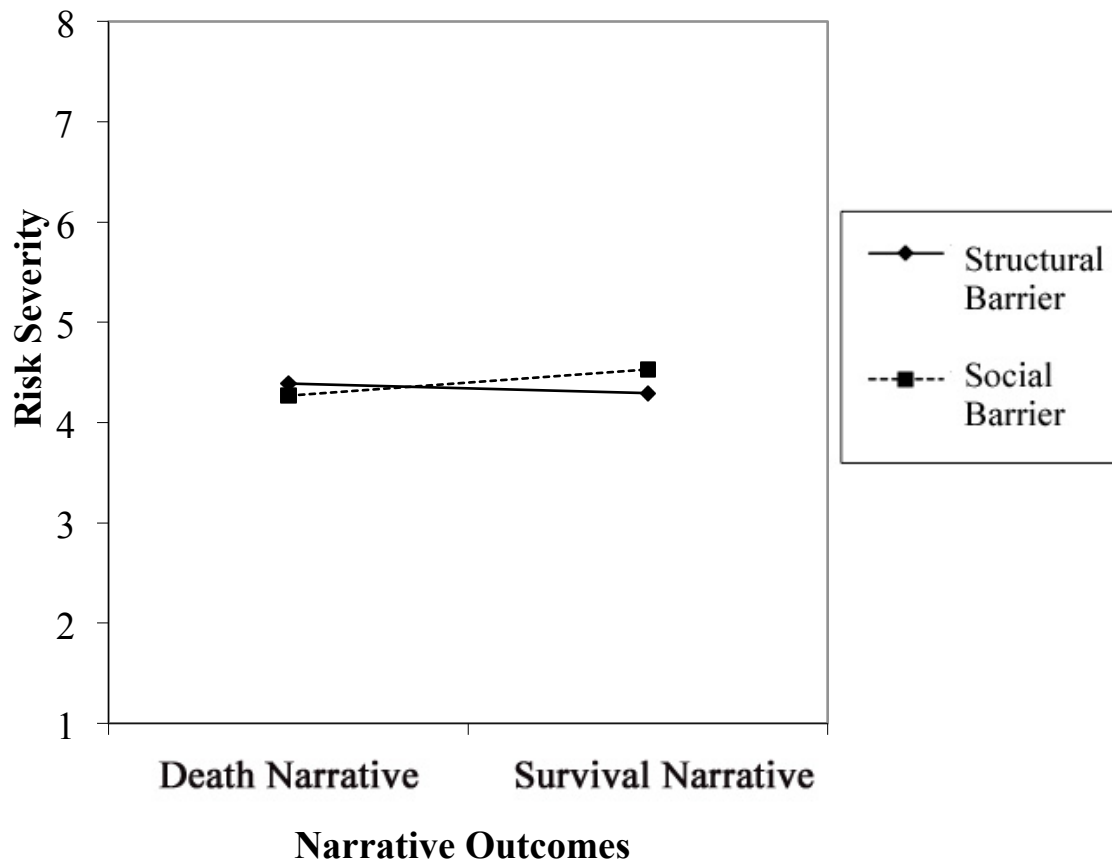
Figure 11. Interaction of Outcome and Barrier on Risk Severity

Note: As shown by the dotted line in the above figure, narratives featuring survival narratives paired with social barriers resulted in greater perceptions of risk severity among participants.
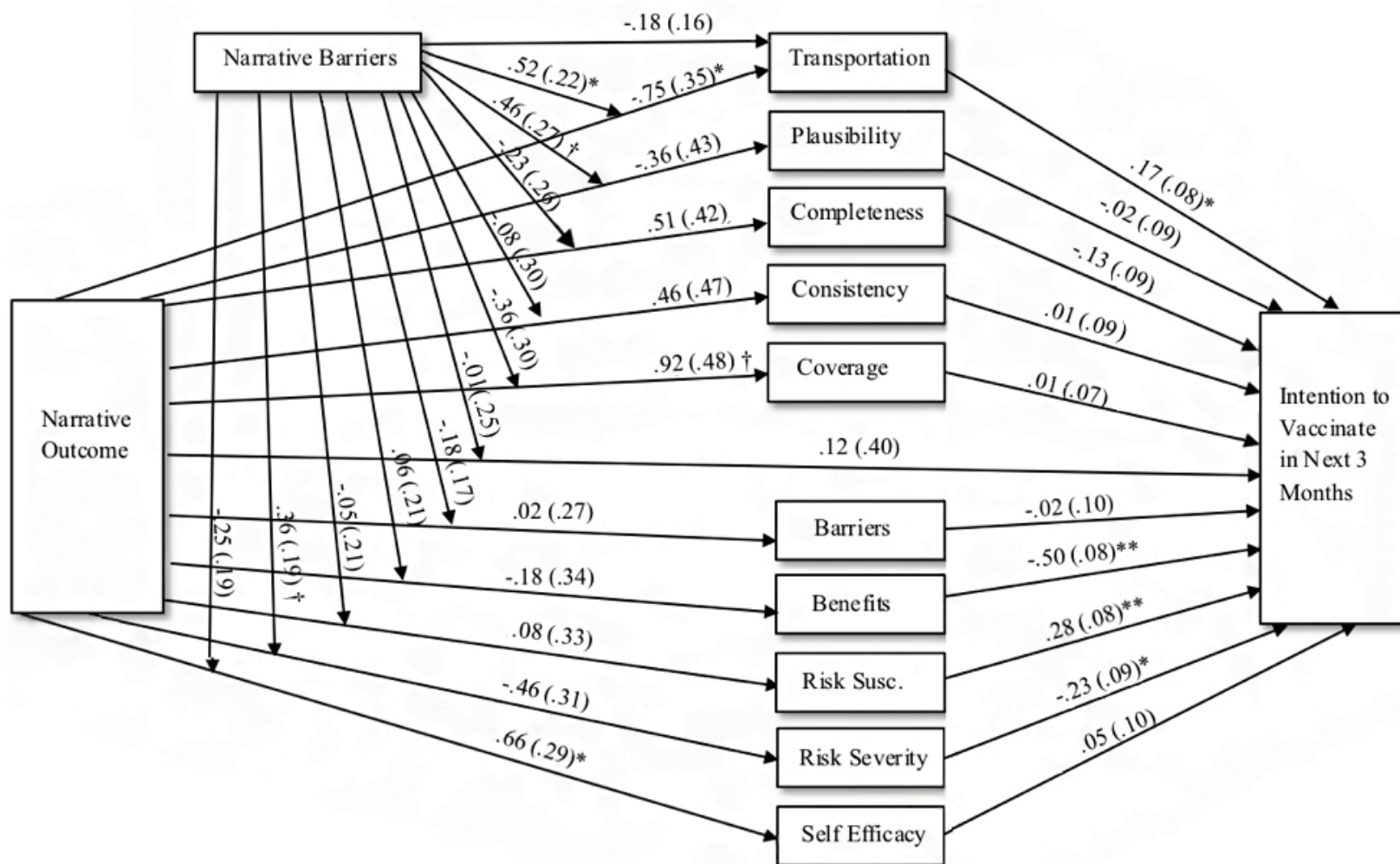
Figure 12. Moderated Mediation

Note: *N* = 246. Moderated mediation model (PROCESS model 8) with narrative outcome as the independent variable, narrative barriers as the moderator, and 10 communication and behavioral process variables as parallel mediators.
†*p* < .10   *p* < .05   **p* < .01

CHAPTER SIX

DISCUSSION

Although narratives have broadly demonstrated great potential to influence

behaviors in numerous health contexts, the efficacy of these stories may vary greatly

from one to the next. In other words, not all health stories translate into successful public

health campaigns (Kreuter et al., 2007). As such, there is a pressing need to engage in

empirical research to better understand the combination of message features that results

in effective health narratives, and the processes that explain how these messages

ultimately move audiences to action. Green (2008) has argued that "pilot testing and

formative research are essential steps" in crafting effective narrative messages. Following

this prompt, the current study examined two key components of cervical cancer

narratives and assessed theorized pathways through which these narratives indirectly

influenced young women's HPV vaccination intentions. Broadly, the current study offers

a successful example for evaluating potential public health campaigns through systematic

message testing.

Findings from this study first contribute to the study of narrative persuasion by

examining two key narrative features (survival/death and social/structural barriers) as part

of a growing effort to build out a typology of narrative message elements. Overall,

survival stories addressing a social barrier to vaccination surfaced as most effective in

increasing vaccination intentions. Of the eight cervical cancer narrative conditions tested

in the present study, one story demonstrated the greatest potential to increase young

women's intentions to vaccinate for HPV in the next 3 months by increasing narrative

transportation, or the degree to which readers were "carried away" or "absorbed into" the

story. The story depicting Rosie's cervical cancer diagnosis, treatment, and ultimate

survival, in the face of a social barrier to vaccination fared better than stories featuring

the other character Jennie, stories containing structural barriers to vaccination, or stories

depicting the death of either main character.

Message Features: The Importance of Story Outcomes

Results support story outcome as an important health narrative feature that

impacts the degree to which readers become involved in stories. Within the range of

possible storylines, whether a character lives or dies is an important consideration in the

construction of health narratives. Whether survival or death is a more effective outcome

is hinged in part of whether the outcome stimulates cognitive processes that lead to

behavioral effects. In the present study, narrative outcome was related to three

dimensions of narrative believability (plausibility, consistency, and coverage) and two

health belief variables (self-efficacy and perceived barriers). The study hypothesized that

death narratives would lead to greater story engagement than survival narratives. Counter

to these predictions, across all five variables, survival narratives increased these

processes over death narratives. This finding is important because story outcomes across

existing narrative health campaigns vary in terms of whether individuals featured in the

messages live or die. For example, the CDC's "Tips from Former Smokers" campaign

features a series of brief narratives from survivors of smoking-related health conditions discussing the negative consequences of smoking cigarettes. Other campaigns have featured death narratives, such as the recent Doug Miller colon cancer campaign in Utah.

Therefore, important questions for future research to examine are the contexts in which death and survival outcomes are preferable. Recent research by Jensen and colleagues (under review) suggests that for older adults, death narratives about melanoma are more effective than survival narratives in transporting readers into a story and positively influencing intentions to perform skin self-examinations. However, the present results suggest that cervical cancer narratives targeted to young women appear to work best in a fundamentally different combination of narrative features, emphasizing the survival of a young female character.

There are several possible explanations for the difference in preference for various story outcomes among these audiences. For young women reading about cervical cancer, the younger age range of the audience may suggest that foreshadowed death narratives do not resonate with young adult audiences for myriad reasons. Death and long-term health concern may be less salient for this population, something future studies can directly test. Findings suggest that for cervical cancer prevention, survival stories, rather than stories emphasizing mortality, may resonate more effectively with young adult female audiences. These results are also consistent with previous studies that have found survivor stories to be effective message strategies for cancer control (e.g., McQueen et al., 2011). Given these findings, the present study supports the conclusion that story outcomes matter and that which outcome is most persuasive may be audience- and context-specific. Continued research is needed to investigate the conditions under

which death or survival narrative trump as story outcomes that lead to persuasive ends.

Message Features: The Role of Story Barriers
and Feature Interactions

The findings suggested that narrative outcome was a more influential message feature than narrative barrier. Examined as individual message features, outcomes significantly influenced numerous processes, while narrative barriers had less significant impact across the board of narrative process and only demonstrated a significant relationship with one health belief variable, risk susceptibility. This finding is interesting in that a great deal of research attention has been focused on barriers to HPV vaccination (Holman et al., 2014). Yet, in this study manipulating the barrier presented in the story did not affect engagement with the story nor directly influence vaccination intentions.

Instead, study results address a more complex issue beyond a concern over individual message features. Kreuter and colleagues (2007) note that beyond the study of isolated features, "[e]ven more limited is empirical evidence of how these elements work independently versus in combination to produce desired health outcomes" (p. 229). The factorial design of the present study allows for analysis of how features work in conjunction to enhance reader engagement with a story and ultimately, its impact on health behaviors. To this effect, the study found that barriers might be more effectively conceptualized as a moderating feature within survival narratives. Put another way, the interaction or combination of two message features together formed a story that generated greater transportation for readers. More specifically, in the present set of cervical cancer narratives, social barriers proved to be more transporting than structural barriers in stories

featuring survival outcomes. This finding reiterates an important consideration in construction of public health narrative messages. Stories, by definition, contain an integrated structure comprised of multiple narrative features, including characters, plot twists, and outcomes and should therefore be assessed in terms of both individual features and in a more holistic assessment of the story structure. The interaction finding in the present study emphasizes the importance of considering features in conjunction and contributes at least one example of how narrative features can be successfully paired to increase narrative engagement.

Mediating Processes and the Integrated Model of
Narrative Persuasion

Previous work on story-based HPV vaccination campaigns has noted the need for more research on the narrative mechanisms of persuasion (Hopfer, 2012). To date, the narrative persuasion research has produced support for several psychological processes theorized to engage readers in narratives. These include transportation, the degree to which a reader is "carried away," "absorbed," or "transported" into a story posited by Transportation Imagery Theory, and narrative believability, or how a reader evaluates the plausibility, completeness, consistency, and coverage in a story, posited by The Story Model. Thus, the present study examined transportation and narrative believability as potential narrative mechanisms that could mediate the message–behavior relationship in narrative health campaigns. The study also considered additional possible mechanisms of message resistance suggested by entertainment research, counterarguing and reactance. Finally, the study examined health belief variables prevalent in health promotion

literature that could also account for differences in intentions to engage in HPV vaccination. Five constructs from the Health Belief Model, perceived susceptibility, perceived severity, benefits, barriers, and self-efficacy, were evaluated to determine if they contributed to the explanatory power of an integrated model of narrative persuasion.

Interestingly, the analysis found that the majority of constructs from existing models of narrative message processing failed to mediate the effect of narratives on vaccination intentions. In other words, most theorized narrative mechanisms failed to account for *why* survival stories with social barriers emerged as the most effective narrative about cervical cancer for young women in this sample. Analyses determined whether any of these variables successfully mediated the pathway from message to behavioral intention. Only two of the process variables, transportation and risk severity, significantly related mediated the relationship between cervical cancer narratives and intentions to vaccinate. Of these two, transportation accounted for the survivor/social barrier effect on intention and demonstrated the greater of the two mediating effects. At the same time, death narratives with structural barriers increased perceptions of the seriousness of the health issue, but this led to a decrease in intentions to vaccinate. Such mediation suggests that counter to the goal of the message (to increase health behavior), features (death and structural barriers) that increase risk severity in this way may produce a possible fear control response to the narrative message.

The observation that transportation acts as a robust mediator of narrative messaging and behavioral intent is consistent with the findings of a previous study of intentions to perform skin self-examinations to prevent skin cancer (Jensen et al., under review). From a mechanism standpoint, transportation seems to be a strong driver of how

narrative persuasion operates. Yet, transportation alone is not sufficient to account for the complex processing that results in behavior change. While transportation clearly mediates the pathway from messages to outcomes, not all readers who are transported will be moved to action. Consistent with this idea, the present study found a smaller effect across the transportation to intention path than the initial jump from narratives to transportation. While transportation accounts for whether a reader is drawn into a story, more research is needed to determine how transportation translates into persuasive outcomes, such as attitudes, intentions, and behaviors.

In terms of narrative persuasion, neither Transportation Imagery, nor story model, constitutes a comprehensive theory. Rather, it is probable that narratives operate along several and complex pathways in order to achieve health behavior outcomes. Thus, in addition to examination of individual mediators, the study proposed an integrated model of narrative persuasion that combined constructs from the Transportation Imagery Model, The Story Model, and message resistance variables from entertainment research. The study also considered whether the addition of Health Belief constructs benefited the model's ability to explain how narrative messages translate into health intentions. To this end, tests of the integrated model of narrative persuasion examined whether 10 process-oriented variables functioned as mediators of HPV intentions. This model included more potential mediators than those suggested by MANCOVA results, in order to test these processes to increase narrative persuasion in a collective and parallel fashion.

The results call attention to the limitations of existing efforts to develop narrative persuasion theory and measurement. Despite the efficacy of well-supported narrative believability and entertainment measures in other narrative persuasion contexts (e.g.,

Yale, 2013), these processes failed to emerge as significant mediators in the context of this study. This finding suggests there may be other compelling components of narrative persuasion processes yet to be identified and that narrative persuasion scholars should continue to pursue in future research.

For example, the narrative processes examined in this study do not focus on the role of affective responses to narrative messages. Oliver and Raney (2011) argue that narrative message processing may occur through one of two possible affective routes, hedonic or eudemonic. They posit that audiences who engage a hedonic approach to entertainment media seek to be entertained by stories, or seek pleasurable media experiences. Alternately, those who are eudamonically-motivated experience media as meaningful, rather than pleasant or enjoyable. This accounts, for instance, for why a movie-viewer might report "enjoying" a film such as *Schindler's List*. In the same light, health narratives are often not inherently pleasure-inducing, but may instead persuade by providing audiences with a eudemonic, or meaningful, narrative experience. Future studies should consider the role of these differing affective motivations in reader or viewer engagement with health narratives, and whether stories that are more eudamonically-driven are ultimately more persuasive.

Another process in need of greater examination is perceived realism. Since the conclusion of the present study, Cho and colleagues (2014) have developed a scale of perceived realism in narrative persuasion. This scale proposes five dimensions of realism (perceived plausibility, perceived typicality, perceived factuality, perceived narrative consistency, and perceived perceptual quality) that closely align with several of the processes included in the present study (e.g., the dimensions of narrative believability).

Because narrative persuasion is complex, more work is needed to determine whether these additional processes may work in unison with existing constructs in the model to provide a more comprehensive explanation of message processing.

Limitations and Future Directions

The present study is not without limitations. First, these findings are limited to one set of cervical cancer narratives drawn from advocacy organizations. It is possible that other narratives about cervical cancer may have very a different impact on young women, and may even be more effective in influencing vaccination outcomes. Future studies should address this limitation by testing a broader range of HPV narratives featuring diverse storylines. Results are also limited in that they cannot be generalized to other cancer communication contexts or target populations. It is likely that the interaction of story features that fared best in this analysis may not be the most effective narrative approach for audiences beyond young women who have not been vaccinated for HPV.

Additionally, the present study focused on written narrative messages. Still unknown is how other narrative formats, such as videos or photographic narratives, may influence cervical cancer prevention outcomes for this audience (Green, 2008). Given the technological access of this generation, it is possible that more media-rich narrative formats may be more effective with young women. For example, video narratives may stimulate more vivid imagery, an important component of Green and Brock's (2000) transportation imagery theory. Moreover, the study design did not allow for examination of dosage effects (Green, 2008). Women are likely to encounter a variety of narratives about HPV vaccination and cervical cancer in young adulthood. The present study

presented each participant with a single story. Future research could examine the impact that repeated exposure to a range of cervical cancer narratives, or increasing the "dose" of the messaging, has on the depth of message effects for an audience over time.

The integrated model of persuasion advances understanding of the complex pathways readers engage as they process narrative information. The integrated model brings together constructs from several approaches to narrative persuasion. However, the model is limited by the parallel nature in which potential mediators are conceptualized. As the model is refined, this limitation can be addressed through rigorous testing of alternate variable ordering. This limitation extends beyond the present model to many related conceptualizations of health behavior change. For example, the reliance on a parallel approach to mediation was recently reexamined in a study of Health Belief Model variables. Jones and colleagues (2014) argue that the HBM has generally been assumed to operate as a parallel mediation model. However, this assumption has gone largely untested, and Jones et al. (2014) suggest that the true variable ordering may be otherwise conceptualized, through chain mediation, wherein some variables occur downstream from others. In a similar light, Moyer-Guse and Nabi (2010) argue that message resistance may operate downstream from narrative processes such as transportation, such that absorption into the story then leads to reduced ability to form counterarguments. Similar to the evolution of the Health Belief Model itself, the present test of combined variables in the integrated model is a first step that can be continue to be refined through tests of alternate variable ordering.

One last important limitation to acknowledge is the cross-sectional nature of the survey. Administered at one point in time, the data collected through this survey does not

track the impact of message effects over time (i.e., it is not longitudinal), and therefore, causal claims should be interpreted with caution. Further, the present study measured intentions (to speak with a physician and to get the vaccine) as outcome variables and did not directly measure actual vaccination behaviors. This is a common limitation of experimental work of this nature and can be addressed in several ways through continued work that builds on present findings. Future research should engage a longitudinal data collection process, in which intentions are measured during the first survey and behaviors are measured at a second point in time. This allows researchers to more effectively model the pathways through which narrative messages may actually lead to behavioral change and provide a more complete evidence base for causal arguments regarding narrative persuasion processes. Incorporating both intentions and behaviors as outcome measures may shed more light on how and why narratives influence young women to engage in cancer prevention behaviors.

Despite these limitations, this study offers insight into persuasive narrative-based approaches to public health messaging. Results demonstrate the importance of evaluating cervical cancer narratives to determine the most effective features to include in future public health campaigns. More broadly, the current study also points toward several clear directions for extending this line of inquiry through future research. First, future studies should continue to work toward a more comprehensive typology of message features. Kreuter and colleagues (2007) have proposed several basic categories into which such features and qualities may be organized, such as plot development, character development, suspense, and emotional range. These qualities must be considered individually but also in terms of how they work together to create effective narratives.

The present study contributes to this typology by exploring two such components, narrative outcomes and narrative barriers. At the same time, narrative persuasion scholars are also examining many other message features, such as character stigma (i.e., whether a character is considered to be a member of a social outgroup; Chung & Slater, 2014) narrator perspective (i.e., whether a story is presented in first- or third-person narration; Nan, Dahlstrom, Richards, & Rangarajan, 2015) expand this typology, and such efforts should continue to explore such components of narrative structure.

Future studies should also begin to consider new possibilities for more complex relationships and patterns among mediating constructs, by examining alternative combinations of variable ordering. As previously mentioned, future studies could test some of the mediating constructs in the integrated model as downstream variables, rather than as parallel mediators. For example, in the present model, many theorized variables did not emerge as significant mediators acting simultaneously alongside transportation and other processes. Pertinent to the present findings, such an approach could also assist in further unpacking the impact of perceived severity. To this end, future research should engage longitudinal study designs to more effectively assess variable ordering.

Conclusion

Overall, the present research makes several clear contributions to the study of narrative persuasion in health communication. First, this work demonstrates the utility of narrative message testing for public health campaigns to identify individual message features that are likely to resonate more with target audiences than others. When crafting messages aimed at persuading the public toward healthy behaviors, communicators

should consider how the story will end. The death or survival of the main character holds potential to shape the degree to which the audience will engage with the story and ultimately be moved to engage in recommended health behaviors.

The study also demonstrated how narrative processes such as transportation and narrative believability can be employed as diagnostic tools for effective storytelling in narrative-based public health campaigns. Hence, the results of this study are also clinically significant, in that these findings offer strategies for crafting more effective messages, and ultimately reaching individuals who are not currently engaged in cervical cancer prevention. Specifically, social survival narratives were successful in increasing young women's intentions to get the HPV vaccine.

The present study also contributes to ongoing efforts to develop more robust models and theories of narrative persuasion by positing and testing an integrated model of narrative and health communication processes. Results from the present study suggest that additional processes drawn from an existing model in the behavioral health literature may serve as valuable additions in building process-driven understanding of how narratives move audiences to action in the context of a specific health behavior, HPV vaccination.

Finally, study results are also noteworthy as they draw attention to a fundamental principle of narrative-based health campaigns. That is, the effectiveness of distinctive narrative structures may be audience-specific, health issue-specific, or behavior-specific. This research makes strides toward a more complex understanding of how narratives operate in the context of cervical cancer prevention, moving the literature forward toward a more comprehensive and parsimonious theoretical model of narrative persuasion.

APPENDIX A

EXPERIMENTAL NARRATIVES

The full text of the narratives used in the present study, including feature manipulations, are included in the text below. Manipulations of survival/death outcomes and social/structural barriers are indicated for both the Rosie and Jennie character stories.

Narrative 1: Rosie's Story

 [Introduction for death condition: Not everyone who gets cervical cancer survives.]

Roselyn "Rosie" Taylor, or Mrs. Taylor as she was known to her students, taught health junior high health classes. She taught her students about human papillomavirus (HPV) – and encouraged them to get vaccinated – but never received the vaccine herself. "I'm embarrassed to admit that," Rosie revealed in a chat, "but, of course, it's obvious now. I was the worst student in the class."

It was July, 2010. Rosie was 26 years old. As the doctor examined her cervix during her annual visit, he noticed something unusual. The doctor called his partner in to take a look, and both agreed it was a simple fibroid growth. Rosie pushed to have this mass removed since it was summer, and she was off work as a school teacher. They removed the 4-centimeter "fibroid," and it fell apart in the doctor's hand. He seemed startled by that, but he still felt strongly that it was not cancer. However, as planned, he sent it to the pathologist for further review. Rosie was frustrated. She had a stack of 12 years' worth of perfect pap smears. Moreover, she had just had a C-section for her second child 9 months ago, and been told she was in great health.

The next day, Rosie received the dreaded phone call to come in to speak with the doctor. She never forgot that drive to the hospital--how her heart was beating out of her chest. As she heard the doctor explain the bad news, her life flashed before her eyes. Words such as "Radical Hysterectomy Radiation" seemed to echo as Rosie was swallowed by the reality of her cancer diagnosis. What started out as a supposed "fibroid" that was "not cancer" ended up being diagnosed as a form of cervical cancer called "Adenocarcinoma Cervical Cancer1B2." That same day, her Pap smear test results from her annual exam arrived in the mail. Her Pap test still showed normal results. Had it not looked odd to the doctor, he said she could have gone home and been dead within a year.

The next three months were a blur for Rosie. She sought out four different opinions as to how to proceed with the treatment. She ultimately had a Radical Hysterectomy on August 19, 2010. They removed her cervix, uterus, appendix, and 44 lymph nodes. She went home with a catheter hanging from her lower abdomen, and had to retrain her bladder as the surgery cut very close to the nerves. It was a very difficult time for Rosie, as her two young children had moved in with family since she was too sick to care for them or even lift them. She spent many nights crying in the baby room, missing her children. After she healed from the surgery, it was time to receive five weeks of radiation. This part of the treatment put her in a surgically induced menopause. Radiation also made her get sick, but she credited the help of wonderful medical professionals, family, and friends with getting her through the worst of it.

Death condition:

[Rosie wanted to beat cervical cancer. She wanted to become a survivor. However, the cancer continued to spread. During this time, Rosie was so exhausted and overwhelmed, she broke down several times as she was fighting against the cancer.

Rosie worked hard to overcome the mental and emotional stress of her cancer battle, and ensure that she spent as much quality time with her children and family as she could. As her condition worsened, Rosie realized that although she would not be able to become the survivor she wanted to be, she knew she had a story to tell and a mission to eradicate this cancer through education and HPV awareness. Ultimately, Rosie lost her battle with cervical cancer. Toward the end of her life, she shared a message on her website to educate and encourage other young women:]

Survival condition:

[Rosie wanted to beat cervical cancer. She wanted to become a survivor. However, the cancer continued to spread. During this time, Rosie was so exhausted and overwhelmed, she broke down several times as she was fighting against the cancer.

Rosie worked hard to overcome the mental and emotional stress of her cancer battle, and ensure that she spent as much quality time with her children and family as she could while she continued to fight the disease. Today, after several long years of hard work to rebuild her health and her life, Rosie's doctors consider her cancer-free. She recently shared a message on her website to educate and encourage other young women:]

Structural barrier condition:

["I was 25 years old when the HPV vaccine first became available for girls and women. I remember the doctor mentioning it at the time, but I have always hated needles and avoided vaccines like the flu shot. Years later, I have been poked by so many needles for my treatments and face things that are so much scarier, and it seems silly that a fear of needles kept me from getting an important vaccine that could have prevented my cancer. I'm grateful for the extra time my doctors and treatments have given to me, and at the

same time hopeful that people will hear my story and get vaccinated against HPV so they do not have to go through what I experienced. Those three little shots could add years to your life."]

Social barrier condition:

["I was 25 years old when the HPV vaccine first became available for girls and women. I remember hearing about it, but I was too concerned that my friends at church would disapprove of the vaccine and think it meant I was being promiscuous. Years later, I have been through so many difficult conversations about my health and my life with my friends, and face fears much worse than someone's disapproval. I can't even believe that such a minor worry about what people would think kept me from getting an important vaccine that could have prevented my cancer. I'm grateful for the extra time my doctors and treatments have given to me, and at the same time hopeful that people will hear my story and get vaccinated against HPV so they do not have to go through what I experienced. Those three little shots could add years to your life."]

Full text of Jennie character's narrative, including feature manipulations.

Narrative 2: Jennie's story

[Introduction for death condition: Not everyone who gets cervical cancer survives.]

Jennie was 20 years old, and in a serious relationship with her boyfriend for almost a year when it happened. He was her first sexual partner, and they used protection almost all of the time. Everything was fine. Or so she thought.

Jennie had her first Pap smear that year, and when the test results came back, her whole world changed. The doctor called Jennie herself and let her know that she had human papillomavirus, also known as HPV. The doctor told her she had the high-risk strain that could potentially cause cervical cancer.

The next couple of months were extremely hard on Jennie as she tried to return to a normal routine during the fall of her junior year. She was retested a few months into the semester and found out there were abnormal cells on her cervix. At that point, the doctor explained that Jennie needed to have LEEP surgery as soon as possible because the abnormal cells were cancer cells. LEEP stands for loop electrosurgical excision procedure. During this procedure, the surgeon used an electrified wire loop to remove abnormal tissues from her cervix and surrounding areas. Jennie said the LEEP surgery was one of the worst days of her life. She was in pain, and she felt scared and alone. She had broken up with her boyfriend shortly before the surgery day. They had been having a difficult time as she dealt with the physical and emotional stress of the diagnosis and prepared to undergo this treatment while he went to class and was busy with work in the evenings. He finally admitted that her health situation was too much for him to handle. He left a post-it note on the door of her apartment saying, "I'm sorry, but I can't do this."

It was a low point.

On the day of the surgery, she recalled going through the procedure and the grief alone. Although several good friends stopped by to check in on her, she was too overwhelmed at the time to talk much about what she was going through.

Jennie made it through the surgery successfully, and decided that it this was an opportunity for a fresh start. She was informed that she would have to see the gynecologist every three months to make sure there were no more cancer cells. After the surgery, she had a couple of Pap smears come back with normal results, which was a relief. She even felt well enough to resume classes in that spring. But at age 23, Jennie's Pap smear results came back abnormal.

 [**Transition for survival condition:** She is determined to stay cancer-free, and is working closely with her doctor to monitor the abnormal results.]

Structural barrier condition:

[Jennie recently shared her story online because she wants to encourage every teenager or young adult to get the HPV vaccine. She wrote, "This is the most crucial shot you could possibly get. This will prevent you from getting several different strains of HPV, including the ones most likely to cause cancer like mine. I remember hearing about the vaccine when I was in college, but at the time, scheduling multiple appointments for the three vaccine shots sounded like too much of a hassle. I remember I didn't want to spend all of that time going to the health clinic. But getting sick and fighting to get better has taken more time and energy than I could have imagined, and it took me an extra year to finish school – talk about a hassle! But the worst part is that I wake up every day and worry that the cancer will return. I wish I could go back in time and make those appointments."]

Social barrier condition:

[Jennie recently shared her story online because she wants to encourage every teenager or young adult to get the HPV vaccine. She wrote, "This is the most crucial shot you could possibly get. This will prevent you from getting several different strains of HPV, including the ones most likely to cause cancer like mine. I remember hearing about the vaccine when I was in college, but at the time, I was really worried about what my boyfriend would think if I got vaccinated against HPV. I was scared that he would think it meant I was thinking about cheating, or that I wanted to break up with him. Looking back, those worries seem small compared to what I have had to face over the past few years. I can't belief I let my concern about what he would think stop me from taking care of my own health. But the worst part is that I wake up every day and worry that the cancer will return. I wish I could go back in time and convince myself to get those shots."]

Death condition:

["I definitely have bad days. I still get pretty sad from time to time and wish this did not happen to me. I can say this though – I've changed into a stronger woman because of this disease. I'm much more careful about my health and my relationships, and I know it is important that I share my history with a new partner. I'm also active about getting this message out to other young women."

Ultimately, Jennie lost her life to cervical cancer. Toward the end of her battle, Jennie shared one last message on her website: "I want others to hear my story so they can avoid going through what I've been through. Spread the word to your family and friends, letting them know that getting the HPV vaccine can save you from cancer caused by HPV."]

Survival condition:

["I definitely have bad days. I still get pretty sad from time to time and wish this did not happen to me. I can say this though – I've changed into a stronger woman because of this disease. I'm much more careful about my health and my relationships, and I know it is important that I share my history with a new partner. I'm also active about getting this message out to other young women."

Today, Jennie's cancer is in remission, and she's working to become cancer-free. She also shared a recent message on her website: "I want others to hear my story so they can avoid going through what I've been through. Spread the word to your family and friends, letting them know that getting the HPV vaccine can save you from cancer caused by HPV."]

APPENDIX B

QUALTRICS SURVEY

This appendix contains a full list of items included on the Qualtrics survey questionnaire, which participants completed online. Materials for Item 7 (experimental narratives) are presented in full in Appendix A.

* An asterisk indicates measures that were included in the survey, but not included in the analyses reported in the present study. These measures may be included in future analyses to be reported elsewhere.

Demographic Questions
1. Please enter your age.
2. What is your sex? (male / female)
3. Please specify your ethnicity (select all that apply).
   a. (white / black or African American / Hispanic or Latino / American Indian or Alaska Native / Asian / Native Hawaiian or Other Pacific Islander / Other – please specify)
4. What is your relationship status?
   a. Single / Casual relationship / committed relationship / engaged / married / separated/divorced / other / decline to answer *
5. What is your housing status?
   a. Own my residence / rent my residence / live rent-free with relatives / live rent-free with friends / other – please specify. *
6. How many children do you have? (options from 0-15)

Experimental Condition

7. [Narrative condition here]

Theoretical Variables

8. Character Identification Scale
   Instructions: Thinking about the story you just read about [character], please

answer the following questions.

7-point scale from "strongly disagree" to "strongly agree"

    a. While reading the story, I felt as if I was part of the action.

    b. While reading the story about [character], I forgot about myself and was fully absorbed.

    c. I was able to understand the events in the story in a manner similar to that in which [character] understood them.

    d. I think I have a good understanding of [character].

    e. I ten to understand the reasons why [character] does the things she does.

    f. While reading, I could feel [character]'s emotions.

    g. While reading, I felt I could really get inside [character]'s head.

    h. At key moments, in the story, I felt I knew exactly what [character] was going through.

    i. While reading, I wanted [character] to succeed in achieving her goals.

    j. When things went well for [character], I felt joy, but when things went badly, I was sad.

9. Narrative Transportation Scale

Instructions: Please choose the number for each question that best represents your opinion about the story you just read about [character].

7-point scale from 1 = not at all to 7 = Very much

    a. While I was reading [character]'s story, I could easily picture the events in it taking place.

    b. While I was reading her story, activity going on in the room around me was on my mind.

    c. I could picture myself in the scene of the events described in [character]'s narrative.

    d. I was mentally involved in the narrative while reading it.

    e. After the narrative ended, I found it easy to put it out of my mind.

    f. I wanted to learn how the narrative ended.

    g. The narrative affected me emotionally.

    h. I found myself thinking of ways the narrative could have turned out differently.

    i. I found my mind wandering while reading the narrative.

    j. The events in the narrative are relevant to my everyday life.

    k. The events in the narrative have changed my life.

10. Narrative Believability Scale

Instructions: Please select the responses that best reflect your opinion about the story you just read about [character]. There are no correct answers.

7-point scale from "strongly disagree" to "strongly agree"

    a. I believe this story could be true.

    b. It was easy to follow the story from beginning to end.

    c. The information given in this story was consistent.

    d. There was important information missing from this story.

    e. This story was plausible.

    f. It was hard to follow this story.
    g. All of the facts in this story agreed with each other.
    h. There were lots of "holes" in this story.
    i. If I were writing this story, I would have organized it differently.

Instructions: Please rate the story you just read about [character].
7-point scale 1 = Very low to 7 = Very High
    j. The "coverage" of a story refers to the extent to which the story accounts for all of the information presented in the story. How would you rate this story in terms of "coverage"?
    k. The "consistency" of a story refers to the extent to which a story does not contradict itself or contradict other things you know to be true or false. How would you rate this story in terms of "consistency"?

11. Counterarguing Measures
    Instructions: For each question below, please select an answer that best represents your opinion.
    5-point scale from "strongly disagree" to "strongly agree"
    a. I found myself actively agreeing with [character]'s points in the story.
    b. I found myself disagreeing with the story.
    c. I was looking for flaws in the story.
    d. I was easy to agree with the points made in the story.
    e. I wanted to correct one or more points in the story.
    f. I wish I could respond to the author of the story.

12. Reactance Scale
    Instructions: Think about the feelings you experienced while reading the story just a few moments ago. Please select the best response for each item below.
    While reading the story, how often did you experience the following feelings?
    7-point scale 1 = Not at all, 7 = Very much
    a. I felt angry while reading the story about [character].
    b. I felt irritated while reading the story.
    c. I felt annoyed while reading the story.
    d. I felt aggravated while reading the story.

Think about the story you just read as you answer the following questions.
5-point scale, 1 = strongly disagree, 5 = strongly agree

    e. The story tried to force its opinions on me.
    f. The story tried to pressure me to think a certain way.
    g. The story triggered a sense of resistance in me.
    h. I considered advice from the story to be an intrusion.
    i. I wanted to argue against the story as I read through it.

13. Health Belief Model: Efficacy
    a. You can arrange transportation to get the HPV vaccine.

      b. You can arrange other things in your life to get the HPV vaccine.
      c. You can get the HPV vaccine even if you are worried.
      d. You can find a way to pay for the HPV vaccine.
      e. You can make an appointment to get the HPV vaccine.
      f. You know for sure you can get the HPV vaccine if you really want to.
      g. You know how to get the HPV vaccine.
      h. You can find a place to get the HPV vaccine.
      i. You can find a place to get the HPV vaccine.
      j. The HPV vaccine is an effective way to prevent HPV infections.
      k. The HPV vaccine is an effective way to prevent cervical cancer.
      l. The HPV vaccine is an effective way to prevent genital warts.

14. Health Belief Model: Benefits
      a. My family will benefit if I get the HPV vaccine.
      b. If I get the HPV vaccine, I will not worry as much about cervical cancer.
      c. If I get the HPV vaccine, I will not worry as much about getting an HPV infection.
      d. Getting the HPV vaccine is the best way to prevent cervical cancer.
      e. My friends will support my decision to get the HPV vaccine.
      f. My family will support my decision to get the HPV vaccine.
      g. Getting the HPV vaccine will improve my health in general.

15. Health Belief Model: Barriers
      a. I don't know how to go about getting the HPV vaccine.
      b. Scheduling an appointment to get the HPV vaccine is difficult.
      c. The HPV vaccine costs too much.
      d. I am too scared of needles to get the vaccine.
      e. I do not support vaccinations of any kind.
      f. My friends will judge me negatively if I get the HPV vaccine.
      g. My family will not approve of me getting the HPV vaccine.
      h. I don't need to get the HPV vaccine.
      i. I don't know enough about the HPV vaccine to get it.
      j. I don't have anyone I can talk to about the HPV vaccine.

16. Health Belief Model: Perceived Risk (Susceptibility and Severity)
      a. It is likely that I will get an HPV infection in my lifetime.
      b. My chances of getting cervical cancer are great.
      c. I feel that I will get cervical cancer sometime during my life.
      d. Cervical cancer is a serious disease.
      e. HPV is a serious health concern.

17. Behavioral Outcomes
      a. I intend to begin the HPV vaccination series in the next month. *
      b. I intend to begin the HPV vaccination series in the next 3 months.
      c. I intend to begin the HPV vaccination series in the next 6 months. *
      d. I intend to talk to my friends about the HPV vaccine within the next two

weeks. *

e. I intend to talk to my family about the HPV vaccine in the next two weeks. *
f. I intend to talk to my doctor about the HPV vaccine in the next two weeks.
g. I intend to search online for more information about the HPV vaccine in the next two weeks. *
h. I plan to book an appointment to get the HPV vaccine in the next two weeks. *

18. Past Behaviors
    a. Have you ever been vaccinated for the flu?
    b. Have you been vaccinated for the flu in the past six months?
    c. Have you ever been diagnosed with any form of genital warts?
    d. Have you ever had an abnormal Pap smear?
    e. Have you ever been vaccinated for Hepatitis B?
    f. Have you ever had an HPV infection?
    g. Have you ever been diagnosed with cervical cancer?
    h. Have you ever been diagnosed with anal cancer?
    i. Have you ever been diagnosed with oral cancer?
    j. Have you been vaccinated against HPV?
    k. I am in the process of being vaccinated for HPV (have had at least one but not all three shots).

19. Sexual Background
    a. Would you describe yourself as:
        i. (heterosexual / gay/lesbian / bisexual / transsexual / transgender / prefer not to answer) *
    b. Have you ever been someone in an intimate or sexual way? *
    c. Have you ever touched someone's genital or private parts? *
    d. Have you ever had oral sex? *
    e. Have you ever had sexual intercourse?
    f. During your life, how many people have you had sexual intercourse with? *
    g. During the past 3 months, how many people have you had sex with? *
    h. How old were you the first time you had intercourse? *
    i. The last time you had intercourse, did you or your partner use a condom? *

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