

This article was downloaded by: [Ohio State University Libraries]

On: 11 January 2013, At: 05:31

Publisher: Routledge

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



Health Communication

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/hhth20>

Severity, Efficacy, and Evidence Type as Determinants of Health Message Exposure

Matthias R. Hastall^a & Silvia Knobloch-Westerwick^b

^a Institute of Media and Education Technology, University of Augsburg

^b School of Communication, The Ohio State University

Version of record first published: 18 Jul 2012.

To cite this article: Matthias R. Hastall & Silvia Knobloch-Westerwick (2012): Severity, Efficacy, and Evidence Type as Determinants of Health Message Exposure, *Health Communication*, DOI:10.1080/10410236.2012.690175

To link to this article: <http://dx.doi.org/10.1080/10410236.2012.690175>

PLEASE SCROLL DOWN FOR ARTICLE

Full terms and conditions of use: <http://www.tandfonline.com/page/terms-and-conditions>

This article may be used for research, teaching, and private study purposes. Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae, and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand, or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

Severity, Efficacy, and Evidence Type as Determinants of Health Message Exposure

Matthias R. Hastall

*Institute of Media and Education Technology
University of Augsburg*

Silvia Knobloch-Westerwick

*School of Communication
The Ohio State University*

This cross-cultural experiment examined the effectiveness of three health message characteristics to foster or inhibit selective exposure to health information. An online magazine was created with eight articles about various health risks. Four articles were manipulated regarding (1) severity of the described health threat (low versus high), (2) suggested efficacy to avoid or minimize negative consequences (low versus high) and (3) type of evidence presented (statistical information versus exemplar information). Respondents from the U.S. and from Germany ($n = 301/298$) browsed through the magazine while selective exposure was unobtrusively logged. Findings reveal country-specific exposure patterns. A positive main effect of severity was only found for U.S. respondents. Independent of respondents' country, significantly more time was spent with low-severity/high-efficacy messages and high-severity/low-efficacy messages than with articles featuring the often-recommended high-severity/high-efficacy message combination. Respondents generally read more exemplar messages than those with statistical evidence, especially when high efficacy was suggested. Implications of these exposure patterns for the real-life effectiveness of health messages are discussed and an improved theoretical conceptualization of message effectiveness is proposed.

Attracting the target audience's attention to messages about health risks remains one of the most challenging objectives in health communication (Pease, Brannon, & Pilling, 2006; Rimal & Adkins, 2003). Even though many factors have been established as affecting selective exposure in the contexts of political communication, general news, and entertainment (see overviews by Donsbach, 2009, and Knobloch-Westerwick, 2006, 2008), much less evidence is at hand for the realm of health information. Many health campaigns are hindered by insufficient exposure (Hornik, 2002; Noar, 2008), and very little is known about the potential of health message features to foster or inhibit selective exposure. Building on persuasion theories and research, the

current investigation addresses this research gap and focuses on three health message characteristics that have been repeatedly postulated to influence health behavior and are thus frequently used in health message design. As related effects research was often conducted in forced-exposure settings, it is not clear yet to what extent the observed effectiveness patterns also apply to everyday media use: "Although laboratory studies can tell us a great deal about how to develop persuasive appeals that have maximum impact on individuals who are exposed to them, they provide only limited information about the effectiveness of persuasion in a mass media context. In real life, audiences can actively or passively avoid exposure to health messages" (Stroebe, 2000, 64).

Based on a thorough literature review, three frequently incorporated health message characteristics were chosen to be included in this analysis: the severity of a health risk, the efficacy to avoid a threat or to minimize its negative outcome, and finally the type of presented evidence (statistical

Correspondence should be addressed to Matthias R. Hastall, University of Augsburg, Institute of Media and Education Technology, Universitätsstraße 10, 86135 Augsburg, Germany. E-mail: Matthias.Hastall@phil.uni-augsburg.de

information versus exemplar information). Drawing on persuasion research, these characteristics and their presumed relationship to health message exposure and avoidance are discussed next. The derived hypotheses are then tested in a cross-cultural experiment.

SEVERITY AS MESSAGE CHARACTERISTIC AND SELECTIVE EXPOSURE

The term *severity* is subsequently used for message cues that emphasize a serious threat potential of health risks (e.g., “Swine flu leads to death!”). Emphasizing the severity of a health threat is a communication strategy frequently employed by journalists and health communication practitioners to increase individuals’ awareness of risks (Kline & Mattson, 2000; Peinado, 2009; Sheer & Chen, 2008; Witte, 1992). Perceived severity refers to the “magnitude of harm believed to be a likely consequence of the threat” (Murray-Johnson & Witte, 2003, p. 478). Popular persuasion and health behavior models such as the Protection Motivation Theory (Rogers, 1975), the Extended Parallel Process Model (Witte, 1992), the Health Belief Model (Rosenstock, 1960), and the Precaution Adoption Process Model (Weinstein, 1988) all share the assumption that individuals need to perceive a health risk as threatening before they consider engaging in health-protective behaviors. Health threats are often conceptualized in health communication as a function of severity and susceptibility (Rosenstock, 1960; Witte, 1992). We subsequently focus on message severity, because it constitutes a crucial component of many health messages with important implications for recipients’ risk perceptions (Witte & Allen, 2000) and behavior change according to several theoretical frameworks in health communication and persuasion research.

Yet it is unclear how threat as a health message factor might affect selective exposure to health information. Are messages more likely to be considered for reading merely because of suggested high threat levels? Applying the available theoretical approaches to answer this question reveals inconsistent answers. For example, the Informational Utility Model (Knobloch-Westerwick, 2008), the Extended Parallel Process Model (Witte, 1992), and various news value classifications (Eilders, 2006) imply that higher levels of threat should lead to increased selective exposure. According to the Stage Model of de Hoog, Stroebe, and de Wit (2007), the “severity of a risk can . . . operate as a motivational factor that increases the likelihood of systematic processing, even when vulnerability is low” (p. 262). As Witte and Allen (2000) note, the “vivid and often gruesome pictures (as part of the manipulations)” of many fear appeals are “likely to be novel and attended to more carefully than other less striking features of the message” (pp. 602–603). In contrast, theoretical approaches like Terror Management Theory (Goldenberg & Arndt, 2008),

Mood Management Theory (Zillmann, 2000), Theory of Cognitive Dissonance (Festinger, 1957), Parallel Response Model (Leventhal, 1970), and the Information Management approach (Brashers, Goldsmith, & Hsieh, 2002) explain why individuals may be occasionally motivated to avoid contact with unpleasant, fear-arousing or death-related messages. Empirical evidence regarding this topic is scarce and inconsistent (e.g., Rimal & Real, 2003; Turner, Rimal, Morrison, & Kim, 2006). In light of the conflicting assumptions and evidence regarding the effects of severity of suggested health threats on message exposure and message avoidance, we examine the following competing hypotheses.

H1a: Media users prefer health messages describing severe health threats compared to messages suggesting low-severity threats.

H1b: Media users avoid health messages describing severe health threats compared to messages suggesting low-severity threats.

EFFICACY AS MESSAGE CHARACTERISTIC AND SELECTIVE EXPOSURE

According to health behavior theories like the Extended Parallel Process Model, the revised protection motivation theory (Maddux & Rogers, 1983), or the revised Health Belief Model (Rosenstock, Strecher, & Becker, 1988), messages depicting severe health threats are more likely to motivate behavior changes if they include efficacy information. In the following, we use the term *message efficacy* to refer to a message characteristic that may increase an individual’s belief that a recommended behavior change is effective in terms of threat avoidance (response-efficacy) and the belief that one is capable to perform the advocated action (self-efficacy; e.g., Witte, 1992). Efficacy and related constructs are central components of several health behavior or persuasion theory frameworks (e.g., revised Health Belief Model, revised Protection Motivation Theory, Extended Parallel Process Model, Theory of Planned Behavior: Ajzen, 1991; Social Cognitive Theory: Bandura, 2004) and have been shown to be a key determinant of behavior changes in numerous investigations (Bandura, 2007). The majority of supporting studies, however, were conducted in forced-exposure settings and thus were unable to account for respondents’ potential individual exposure preferences regarding these messages. The current study aims to address this shortcoming and furthermore intends to shed light on possible interactions between severity and efficacy with respect to health message exposure and avoidance.

Although empirical findings overall indicate that individuals prefer messages for reading that suggest high levels of efficacy rather than low levels (e.g., Knobloch, Grimmer, Hastall, & Brück, 2004; Lee, Hwang, Hawkins, & Pingree, 2008), to our knowledge, health messages have not

specifically been examined in experimental investigations regarding this question. Based on the positive relationship between message efficacy and message exposure suggested by the Information Utility Model (Knobloch-Westervick, 2008), we propose the following hypothesis regarding selective exposure.

H2: Media users prefer health news suggesting high levels of efficacy to avoid health threats or to minimize its negative consequences, compared to messages implying low efficacy levels.

Furthermore, theoretical approaches to persuasion like the Extended Parallel Process Model, the revised Protection Motivation Theory, and the Risk Perception Attitude Framework (Turner, et al., 2006) predict a specific interaction between threat and message efficacy with respect to health behavior changes. According to these models, health messages are most persuasive if they emphasize both the severity of a health threat and individuals' efficacy to avoid said threat. Regarding selective exposure, the question remains, however, of whether such an interaction emerges instead of the hypothesized main effects of message severity and message efficacy (H1 and H2) or in addition to them. We address this interaction from a selective exposure perspective with our third hypothesis.

H3: Media users prefer health messages suggesting high severity and high efficacy simultaneously, compared to messages featuring other combinations of these message characteristics.

EVIDENCE TYPE AS MESSAGE CHARACTERISTIC AND SELECTIVE EXPOSURE

Even though severity and efficacy are recognized as important message components in many health communication frameworks, health journalists are likely to focus strongly on other message elements such as a "human angle" to facilitate the communication of medical information in a comprehensible, credible, and appealing manner (Viswanath et al., 2008). Two strategies, the depictions of individuals who have "suffered from a certain disease, faced a problem with the health care system, or participated in a clinical trial" and the presentation of "data or statistics" about this health issue, are particular common (Hinnant, 2009, p. 692). Both personal accounts and statistics were repeatedly contrasted as two prototypical types of evidence and have been extensively studied by communication and psychology scholars (e.g., Allen & Preiss, 1997; de Wit, Das, & Vet, 2008; Hoeken, 2001).

Statistical evidence, on one hand, is considered to be a rather valid type of evidence that holds limited intuitive appeal due to its rather abstract character. Personal case descriptions ("exemplars") that exemplify the experience of a single person, on the other hand, are viewed as more vivid

and attention-grabbing, yet less valid and likely misleading regarding the significance or consequences of threats (Zillmann & Brosius, 2000). Exemplars, which can also function as behavioral models, can be easily incorporated in health messages to signify the severity of a threat, to demonstrate the effectiveness of recommended responses, or to strengthen other parts of the argumentation (de Wit, Das, & Vet, 2008; Zillmann, 2006). Moreover, exemplars or narrations can also be used to adapt messages to cultural specifics of a target group (Kreuter, 2008) and to minimize counterarguing and psychological reactance (Knowles & Linn, 2004; Limon & Kazoleas, 2004).

Compared to statistical evidence, Exemplification Theory (Zillmann, 2006; Zillmann & Brosius, 2000) and Narrative Theory (Hinyard & Kreuter, 2007; Larkey & Hecht, 2010) assume exemplar and narrative evidence as more powerful to influence recipients' risk perceptions and health-related attitudes. Bandura's (1986) Social Cognitive Theory likewise emphasizes the importance of behavioral models for conveying new behavioral patterns and health behavior changes. Overall, research findings regarding the relative effectiveness of both evidence types remained inconsistent (Allen & Preiss, 1997; Reinhart & Feeley, 2007). Findings from investigations in the area of risk communication suggest, however, that individuals tend to disregard available statistical information and that exemplars are more powerful to influence recipients' risk perceptions and intentions for behavior changes (e.g., de Wit, Das, & Vet, 2008; Zillmann, 2006). Handbooks like the World Health Organization (2005) field guide for media communication during public health emergencies advise one to "personalize risk data by using stories, narratives, examples and anecdotes" and also recommend that one "avoid distant, abstract and unfeeling language about harm, deaths, injuries and illnesses" (p. 53). These considerations have been built on persuasion research, and the available findings are almost exclusively based on forced-exposure studies. Thus far, the effectiveness of exemplars versus statistics to foster selective exposure or avoidance has not yet been tested. Given that theoretical frameworks and empirical evidence suggest an advantage of exemplars over statistics in this regard, we posit the following hypothesis.

H4: Media users prefer health messages featuring exemplar evidence, compared to messages featuring statistical evidence.

Although the three message characteristics of severity, efficacy, and evidence type are conceptually different, they are likely to jointly influence recipients' attitudes or behaviors. The combined influence of severity and efficacy was already discussed earlier and is addressed in H3. But how are these message types related to the two evidence types, statistics and exemplars? Both evidence types can be incorporated in health messages to illustrate the severity of threats and individuals' efficacy to avoid negative health consequences. But even purposely distinct manipulations of these three

message features cannot guarantee that recipients will not perceive them as interdependent. "An exemplar in which a person suffers the consequences may increase the perceived threat, but at the same time reduce the perceived efficacy. An exemplar in which the person performs the recommended behavior can increase the perceived efficacy but at the same time reduce the perceived threat" (Hoeken, 2004, p. 12). The same likely holds true for statistical evidence. A recent review of interaction effects among Protection Motivation Theory constructs likewise indicates that severity and efficacy may influence each other in several ways (Cismaru & Lavack, 2007). One aim of the current investigation is to explore the direct and interaction effects of these three message factors on recipients' health message exposure or avoidance, which may also vary for readers of different cultural background.

CULTURAL CONTEXTS

The importance of considering cultural differences for effective health communication has been widely acknowledged (e.g., Kazarian & Evans, 2001; Kreuter, 2008). To our knowledge, however, no cross-cultural experiment has been conducted so far that investigated the impact of health message features on selective message exposure or avoidance. As the current investigation is the first to experimentally test the influence of the three already-described message characteristics on actual selective exposure behavior, we are also interested in the cross-cultural robustness of potential effects. Two countries, the United States and Germany, were included in this analysis. Although both belong to the so-called Western culture, they differ remarkably with respect to specific health care structures, health care access, health insurance prevalence, and perceived individual responsibility for own health.

For example, while both countries belong in the worldwide top five regarding expenditures on health as percentage of gross domestic product, the prevalence of certain diseases, mortality rates, and the available medical infrastructures vary considerably (Organisation for Economic Co-operation and Development, 2010; World Health Organization, 2010). The United States has a market-oriented health care system, in which a large portion of the population has no insurance. In contrast, all Germans are by law insured, with the majority being covered by publicly owned health insurance organizations with basically unlimited and mostly free access to most types of medical services (Henke, 2009; Shi & Singh, 2010). The health information environments in the two countries are fundamentally different. Health campaigns are much more common in the U.S. mass media than in Germany (Jerusalem, 2002). Health-related public service announcements (PSAs) are virtually unknown in Germany; advertisements for medicine products or medical services are strictly regulated and the use of strong fear appeals in

commercials for medical products is prohibited (Gelbrich & Schröder, 2008). Finally, health information search behaviors and related online environments also differ between the two countries. More U.S. citizens than Germans search for online health information regularly, and considerably more online health information services are available in the United States than in Germany (Blödorn, Gerhards, & Klingler, 2005; Fox, 2005). In addition to differences regarding the media and health system as well as regulations toward the communication of health threats, the two countries differ in many other cultural, social, and educational aspects, which might lead to dissimilar exposure preferences for health information.

It must be emphasized, however, that the goal of our cultural comparison is not to explain differences between respondents from the United States and from Germany, which would be impossible due to the vast amount of differences between both countries, but instead to explore the cross-cultural stability of message effects on health news exposure for the first time.

RQ1: To what extent do respondents from the United States and from Germany show similar approach and avoidance patterns with respect to effects suggested in hypotheses H1–H4?

METHOD

Overview

Respondents browsed through an experimental online magazine that featured eight articles about health threats. Four articles were manipulated regarding the severity of the described health threat (low versus high), the suggested efficacy to avoid or minimize negative consequences (low versus high), and the type of presented evidence (statistical versus exemplar evidence), resulting in an $2 \times 2 \times 2$ between-group factors design. Selective exposure to article pages and the overview page were unobtrusively logged through server-based Perl scripts. An online questionnaire was automatically uploaded after a 4-minute browsing period.

Sample

Respondents were 301 students from a U.S. university (61.5% female; age: $M = 20.9$ ($SD = 1.6$)) and 298 students from a German university (47.3% female; age: $M = 21.5$ ($SD = 2.0$)). Although the use of college students as research participants is debatable (Peterson, 2001), students are the target group of many health communication activities and their response patterns are thus suitable for testing the present hypotheses. Even though a t -test indicated that the age difference between U.S. and German respondents is statistically significant ($p < .05$), it seems unlikely that an age difference of 0.6 years would produce relevant differences

in exposure between respondents from the United States and Germany.

Participants were recruited in university classes and on the university campus and received either course credit (United States) or five EUR (Germany) as compensation for study participation. The different compensation styles in the two countries resulted from the fact that offering extra credit is essentially unheard of at German universities. Although this difference might have affected magazine exposure, it again seems unlikely that it might produce systematic differences in terms of reactions toward message manipulations.

Stimulus Material

The online health magazine was named “Health News” and displayed the subtitle “Test Version.” Respondents were randomly assigned to one of the eight experimental conditions. In order to increase the external validity of the experimental setting, the online magazine layout and its navigation options mimicked popular health news outlets on the Internet. The middle section of the overview page displayed the eight article leads, which consisted of the article headlines and subheadlines as well as the first sentence of each article. To measure the impact of the three message factors regardless of topic interest and to be able to assume greater robustness for detected effects, four different health topics were chosen for article manipulations. To keep the complexity manageable, a between-group factor manipulation was conducted. Manipulations for three within-group factors across several topics would have resulted in a large number of possible treatment combinations, further amplified by potential effects of article lead positions on the overview page.

The four manipulated articles were all approximately 400 words long (United States: $M = 401$ ($SD = 0.8$); Germany: $M = 402$ ($SD = 0.5$)) and discussed the following health threats: contaminated air in airplanes, glaucoma, stress, and poisoned salmon. Severity was always manipulated in the article headline by mentioning either highly threatening (e.g., heart attacks, cancer, loss of vision) or less threatening outcomes (e.g., dizziness, headaches). Message efficacy was manipulated in the subheadlines (e.g., “Effective treatments widely available” versus “Scientists still don’t know how to cure”). Further, the last paragraph of each article (roughly 50 words) served to manipulate message efficacy and provided information pertaining to response efficacy and self-efficacy. Finally, evidence type was manipulated in the first article paragraph, which was also about 50 words long. The statistics version contained quantitative information about the number of affected individuals, while the exemplar condition presented a short description of a personal experience with the particular health threat, introduced by a quote. The exemplars’ sex was rotated to control for sex-based article exposure preferences.

Likewise, the articles’ placement on the overview page was counterbalanced to control for placement effects. Eight article placement versions were created for this purpose, which contained each article in a different position. Respondents were randomly assigned to the experimental conditions. The four unmanipulated buffer articles served as competing reading material and averaged about 300 words apiece (United States: $M = 302$ ($SD = 1.4$), Germany: $M = 302$ ($SD = 1.8$)). All articles were culled from real health news sources on the Internet and were edited for equal length and to incorporate the experimental manipulations. Overall, we included health topics that should be of equal relevance and interest for students in both countries, although interindividual variations in interest can be expected. Such thematic preferences are beyond the scope of this investigation, however, and almost irrelevant if the impact of message features on selective exposure is analyzed based on aggregated exposure data, as in the current investigation. We furthermore included only topics with relatively low media coverage during the time of the investigation.

Pretests

Pretests in Germany and the United States were conducted to ensure effective article manipulations. Severity and message efficacy were pretested in the United States ($n = 24$; 62% female; age: $M = 21.5$ ($SD = 2.5$)) and in Germany ($n = 32$; 56% female; age: $M = 22.5$ ($SD = 3.1$)). Respondents were presented with the main headlines of the four manipulated articles in a paper-and-pencil questionnaire and were asked to indicate their agreement with two statements (“The consequences of the health threat indicated in this headline are severe”; “The consequences of the health threat indicated in this headline are easy to prevent”) on a 7-point scale (1 = *do not agree at all*, 7 = *absolutely agree*). The exemplification manipulation was pretested only in Germany ($n = 32$; 50% female; age: $M = 20.4$ ($SD = 1.7$)). Respondents saw the news leads (as described earlier) of the four manipulated articles in a paper-and-pencil questionnaire and were asked to indicate on a 7-point-scale (1 = *not at all*, 7 = *definitely*) the extent to which these article featured “personal accounts” and “statistical information” (translated).

Procedure

All data collection sessions were conducted in computer labs on the respective university campus that were regularly used by many students for Internet access and that thus constitute a testing environment that offers high levels of control and an Internet use setting with high external validity. Up to 16 students participated simultaneously. After arriving in the computer lab, respondents were thanked for study participation and informed that they would see a test version of an online health magazine. Respondents were asked to switch off their mobile phones to avoid distractions. The

experimenter made sure that respondents did not access other websites during the predefined magazine exposure time span, but no such behavior was noted.

To encourage selectivity, participants were told to read whatever they find interesting and were informed that the available time would not be sufficient to read all articles. In order to create a selection situation, the time span for reading had to be restricted. Pretests were used to determine a time span in which all respondents were occupied with reading and showed no signs of boredom or distraction. A time span of 4 minutes appeared as suitable for this purpose and has also been proven effective in previous studies (Knobloch, Grimmer, Hastall, & Brück, 2004; Knobloch-Westerwick & Hastall, 2006). Nielsen data on online newspaper use show that readers spend about 3.9 minutes on an online newspaper site visit and 56 seconds on average on an online news page (Newspaper Association of America, 2011, data for March 2011); thus, participants in the present study were able to view about half of the available pages in the scheduled time span for the typical length of time. Hence, selectivity was ensured and total exposure time resembled the amount of time people spend on an online news site in everyday life situations.

The experimental procedure was started by clicking on an icon on the computer desktop. The first screen page repeated the verbal instructions. Respondents then initiated the browsing phase by clicking on a "continue" button. This unobtrusive observation of health news exposure behavior does not rely on respondents' self-reports, introspection, or recall and is therefore to a much lesser extent, if at all, impaired by social desirability considerations. After the predefined 4 minutes of browsing, an online questionnaire was automatically uploaded and prompted respondents to indicate their gender, age, satisfaction with health status, and liking of articles. After completing the questionnaire, respondents were debriefed and received the earlier mentioned compensation for participation.

Measures

Selective exposure. Every navigation decision of the respondents (e.g., loading an article or returning to the overview page) was recorded. Such clickstream data allow the complete reconstruction of respondents' exposure behavior. Selective exposure to a specific article was operationalized as starting when a person clicked on the hyperlink that led to the article page and ending when the "back to overview" button on that article page, or the browser's back-button, was clicked. If a person returned to an article that had been viewed before, the additional viewing time was added to the selective exposure time for that article. Two indicators for selective exposure were generated from the exposure data stream and served as dependent variables in the following analyses: first, the number of selected manipulated articles for reading, and second the time that respondents

spent reading manipulated articles, subsequently referred to as "reading time" and reported as a percentage of overall browsing time. The two indicators were correlated at $r = .57$ ($p < .001$).

Interest. For each manipulated article, respondents indicated their agreement with the statement "This article is interesting" on a 7-point scale (1 = *not at all*, 7 = *absolutely*).

Health satisfaction. Respondents indicated their satisfaction with their personal health status in the last 4 weeks in four domains (physical condition, ability to relax/inner peace, energy level/enjoyment of life, being free from discomfort and pain), which were derived from the health module of the Questions on Life Satisfaction (FLZ^M) questionnaire (Henrich & Herschbach, 2000), on a 7-point scale (1 = *not at all satisfied*, 7 = *absolutely satisfied*).

RESULTS

Pretest Manipulation Checks

For each manipulated article, high-severity versions were perceived in both countries as describing more severe health threats than the low-severity versions (overall: $M = 5.1$ ($SD = 1.4$) versus $M = 3.2$ ($SD = 1.4$); $p < .01$). Likewise, all high-efficacy articles—in contrast to their low-efficacy versions—were perceived in both countries as describing health threats that are significantly easier to prevent (overall: $M = 5.4$ ($SD = 1.6$) versus $M = 3.3$ ($SD = 1.8$); $p < .01$). Finally, all statistical evidence articles were perceived as containing significantly more statistical information than personal accounts (overall: $M = 5.8$ ($SD = 1.7$) versus $M = 3.0$ ($SD = 1.6$); $p < .01$), while exemplar articles were perceived as containing more personal accounts than statistics (overall: $M = 2.8$ ($SD = 1.5$) versus $M = 5.6$ ($SD = 1.7$); $p < .01$). These findings thus establish the effectiveness of all three experimental stimulus material manipulations.

Preliminary Analyses

Selective exposure. During the predefined exposure time span of 4 minutes, respondents read 2.9 articles on average ($SD = 1.0$), of which 1.3 ($SD = 0.7$) were manipulated. On average, 52.6 seconds ($SD = 20.2$) was spent on the overview page. Respondents spent almost equal time with manipulated ($M = 94.0$ seconds, $SD = 50.0$) and unmanipulated articles ($M = 93.2$ seconds, $SD = 48.5$), and 90.3% of the participants read at least one manipulated article.

Interest. For three of the four manipulated articles, independent-sample t -tests indicated no significant country difference with respect to ratings for interest ($p > .05$). Only one article (on "polluted air on airplanes")

was evaluated as more interesting by U.S. respondents ($M_{USA} = 4.1$, $SD = 1.6$ versus $M_{Germany} = 3.6$, $SD = 1.7$; $p < .001$). However, all subsequent analyses are conducted on the aggregated level—across all four manipulated articles—for which no significant country difference was observed ($p < .05$).

Impacts of Severity, Message Efficacy, and Exemplification on Health Message Exposure

Two univariate analyses of variance with the three manipulated health message characteristics (message severity, message efficacy, and evidence type) and country as between-group factors, respondents' age and health satisfaction as covariates, and the two exposure indicators (number of selected manipulated articles and reading time) as dependent variables were conducted. The covariates age and health satisfaction did not influence health news exposure ($p < .05$) and were thus dropped from the model.

Number of selected manipulated articles. The analysis of variance (ANOVA) for the number of selected manipulated articles yielded main effects for evidence type ($F(1, 583) = 11.8$, $p < .001$, $\eta^2 = .018$; $M_{\text{exemplar}} = 1.44$, $SD = .75$, vs. $M_{\text{statistics}} = 1.23$, $SD = .73$), as exemplar evidence fostered article selection more than statistical evidence, as predicted in hypothesis H4, and country ($F(1, 583) = 31.66$, $p < .001$, $\eta^2 = .048$; $M_{\text{Germany}} = 1.17$, $SD = .70$, vs. $M_{\text{USA}} = 1.50$, $SD = .76$), with Americans selecting more manipulated articles than German respondents. A severity \times country interaction ($F(1, 583) = 4.87$, $p < .05$, $\eta^2 = .007$) emerged, indicating that only U.S. respondents selected more articles when message severity was high (compared to low). Hypothesis H1a is thus supported only for U.S. respondents (Figure 1).

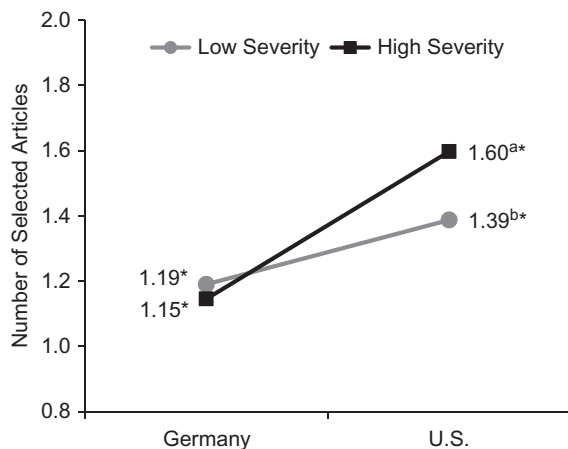


FIGURE 1 Number of selected manipulated articles as a function of country and severity. Means within a country group with different lower case letters differ at $p < .05$. Means within a severity group with asterisks differ at $p < .05$.

The ANOVA also yielded a severity \times efficacy interaction ($F(1, 583) = 8.97$, $p < .01$, $\eta^2 = .014$). In contrast to hypothesis H3, media users clearly preferred articles suggesting low levels of efficacy when severe health threats were described. In contrast, when low severity was suggested, respondents selected significantly less low-efficacy articles (Figure 2).

Furthermore, an efficacy \times evidence type interaction emerged ($F(1, 583) = 5.13$, $p < .05$, $\eta^2 = .008$), indicating that articles suggesting high efficacy were more frequently selected if they featured exemplar evidence instead of statistical evidence (Figure 3). The exposure-fostering effect of exemplar evidence was thus established twice in this analysis, as a main effect as predicted in hypothesis H4 and as an additional interaction effect for high-efficacy messages.

Reading time. Similar to the findings for the number of selected manipulated articles, this analysis yielded main effects for evidence type ($F(1, 583) = 9.4$, $p < .01$, $\eta^2 = .013$; $M_{\text{exemplar}} = 41.7\%$ of browsing time, $SD = 20.6$, vs. $M_{\text{statistics}} = 36.6\%$ of browsing time, $SD = 20.8$), with exemplar articles attracting longer reading times, and country ($F(1, 583) = 22.1$, $p < .001$, $\eta^2 = .031$; $M_{\text{Germany}} = 35.5\%$ of browsing time, $SD = 22.7$, vs. $M_{\text{USA}} = 42.8\%$ of browsing time, $SD = 18.2$), with Americans spending more time on manipulated articles overall. Moreover, a severity \times country interaction ($F(1, 583) = 20.0$, $p < .001$, $\eta^2 = .028$; see Figure 4) and a severity \times efficacy interaction ($F(1, 583) = 31.0$, $p < .001$, $\eta^2 = .044$; see Figure 5) materialized. While respondents from the United States spent most time with health messages indicating high severity, German participants favored low-severity messages (Figure 4). Independent of the respondents' origin, high-efficacy messages were preferred in the low-severity

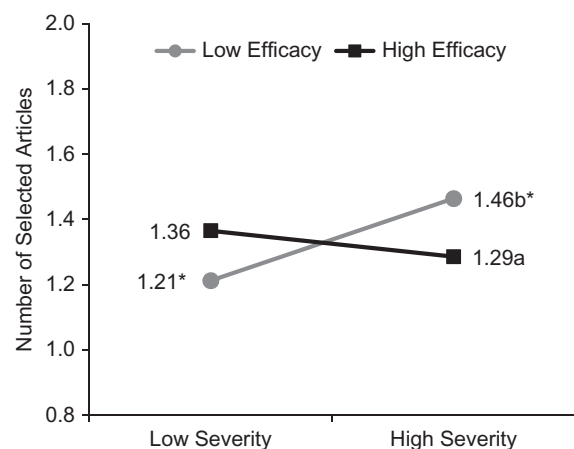


FIGURE 2 Number of selected manipulated articles as a function of severity and efficacy. Means within a severity group with different lower case letters differ at $p < .05$. Means within an efficacy group with asterisks differ at $p < .05$.

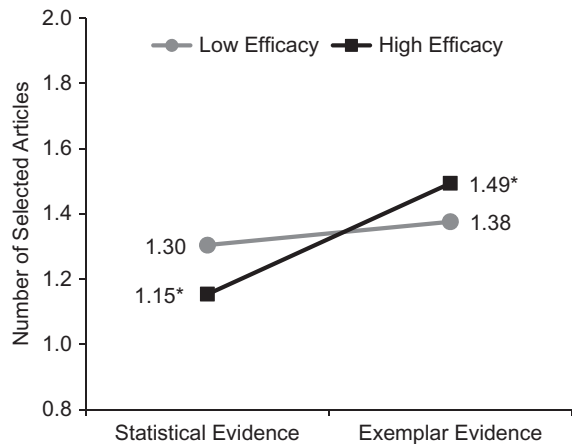


FIGURE 3 Number of selected manipulated articles as a function of efficacy and evidence type. Means within an evidence type group with different lower case letters differ at $p < .05$. Means within an efficacy group with asterisks differ at $p < .05$.

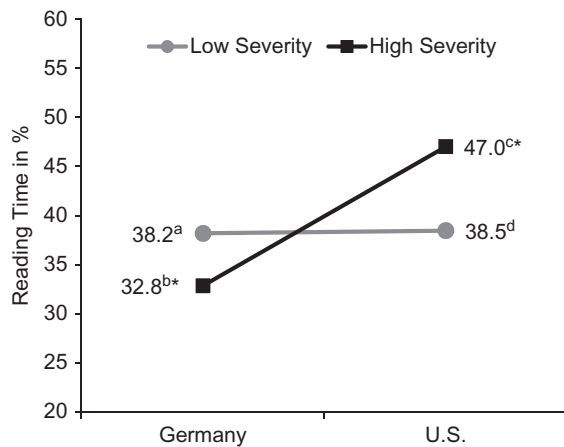


FIGURE 4 Article reading time (%) as a function of country and severity. Means within a country group with different lower case letters differ at $p < .05$. Means within a severity group with asterisks differ at $p < .05$.

condition and low-efficacy messages in the high-severity condition (Figure 5).

Additionally, an efficacy \times evidence type interaction ($F(1, 583) = 15.6, p < .001, \eta^2 = .022$) and an efficacy \times country interaction ($F(1, 583) = 10.3, p < .01, \eta^2 = .015$) emerged, which both were qualified by a three-way interaction between efficacy, evidence type and country ($F(1, 583) = 8.2, p < .01, \eta^2 = .012$; see Figure 6). While German respondents spent more time reading high-efficacy (compared to low-efficacy) messages independent of the incorporated evidence type, U.S. respondents spent more time with low-efficacy messages if they featured statistical evidence or with high-efficacy messages including exemplar evidence. Respondents of both countries spent most time with high-efficacy messages that featured exemplar evidence.

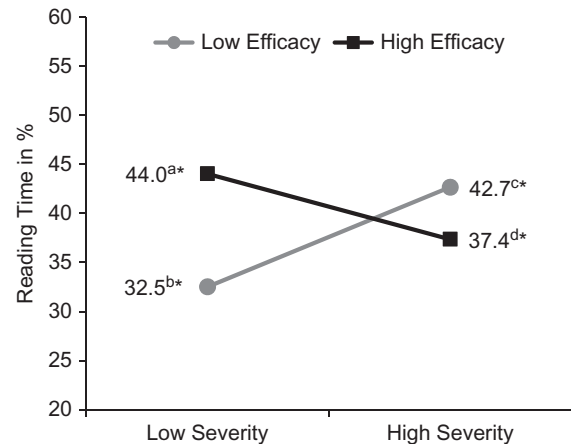


FIGURE 5 Article reading time (%) as a function of severity and efficacy. Means within a severity group with different lower case letters differ at $p < .05$. Means within an efficacy group with asterisks differ at $p < .05$.

DISCUSSION

The investigation presented here examined impacts of three health message characteristics (severity, message efficacy, and evidence type) on recipients' decisions to read or avoid said messages. Culture-specific exposure patterns were observed for the United States and Germany. A direct and positive effect of severity, as presumed in hypothesis H1a, was only observed for U.S. participants (Figures 1 and 4). No direct evidence was found that messages about severe health threats were avoided, as hypothesized in hypothesis H1b. Likewise, selective exposure was not greater for high-efficacy messages, so hypothesis H2 was not supported.

Although a severity \times efficacy interaction emerged for both selective exposure measures, the observed exposure differed from the hypothesized patterns (Figures 2 and 5). In contrast to hypothesis H3, health messages suggesting high levels of severity and low levels of efficacy were clearly more frequently selected and more time was spent with them than with messages featuring the often-recommended high severity/high efficacy combination. Thus, hypothesis H3 was not corroborated.

A main effect for evidence type emerged for both selective exposure measures, the number of selected manipulated articles and article reading time. In line with our assumption derived from Exemplification Theory, respondents preferred health messages featuring exemplar evidence, thus supporting hypothesis H4. However, findings also suggest that the impact of evidence type may be moderated by message efficacy (Figure 3) and country (Figure 6). U.S. respondents clearly spent more time with messages featuring exemplar evidence when high efficacy was suggested, whereas articles featuring statistical evidence were preferred when low efficacy was suggested (Figure 6).

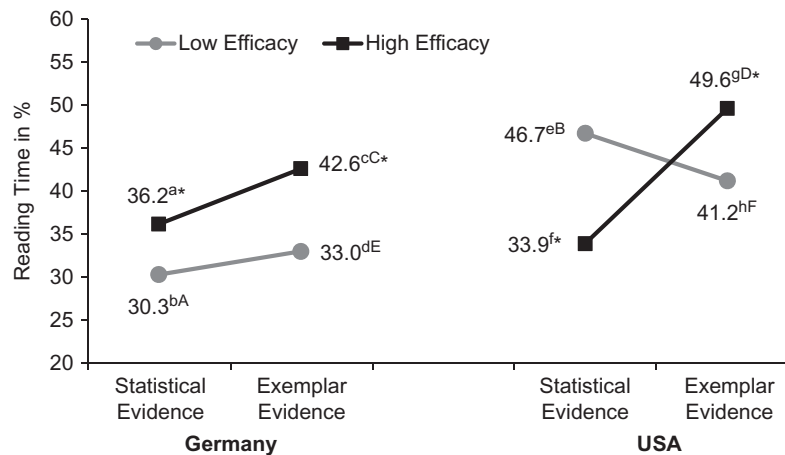


FIGURE 6 Article reading time (%) as a function of efficacy, evidence type, and country. Means within an evidence type group with different lower case letters differ at $p < .05$. Means within an efficacy group with asterisks differ at $p < .05$. Means of the same evidence type \times efficacy condition (e.g., statistical evidence and low efficacy) with different capital letters differ between respondents from the United States and from Germany at $p < .05$.

Particularly the findings regarding severity and efficacy deserve further attention. The observed exposure patterns can be viewed as rather maladaptive—at least from the standpoint of popular health behavior models. More research is required to examine why respondents spent considerably more time with low-efficacy messages than with high-efficacy messages in the high-severity condition. It cannot be ruled out that individuals avoid the presumed effective high-severity/high-efficacy messages in order to assure themselves that nothing can be done about a health threat anyway or by to ignore the existence of serious health threats altogether. In any case, the obtained findings raise doubt that health messages featuring a high-severity/high-efficacy characteristic are actually effective in the real-world media environment with regard to changing health behaviors (for related findings on persuasion effects see Nabi, Roskos-Ewoldsen, & Carpentier, 2008; Roskos-Ewoldsen, Yu, & Rhodes, 2004). Moreover, our results highlight not only the importance of considering exposure preferences when designing effective health messages, but also the value of cross-cultural examinations.

Limitations

A number of limitations must be noted. Respondents could sample from eight articles, which all dealt with health topics. Hence, a forced-exposure situation was created that did not allow avoiding health information altogether. Due to the student sample used, the findings cannot be generalized for other demographic groups. The subsamples from the two countries differed in recruiting incentive and by 0.6 years in age. Although we do not think that the country impacts resulted from this relatively minor difference, we cannot rule this possibility out. Future research should tackle more specifically the underlying factors that may produce country differences: for instance, attitudes toward

health care and self-responsibility for health matters. While the pretest results attested to successful text manipulations, it should be noted that the pretest data were collected in a different setting and with a different display mode than the main experiment (paper-pencil questionnaire instead of online questionnaire). In the main experiment, we did not measure perceptions or recall of the lead texts, as it can be argued that message manipulation checks are not required if manipulations are defined as intrinsic message features and not as audience states (O’Keefe, 2003). However, future research should consider establishing effective experimental manipulations while using a presentation mode that is more similar to the setting of the selective exposure situation, as well as different presentation modes such as radio or TV (e.g., Dillman Carpentier, 2008). The culture-specific and hypotheses-inconsistent findings for message severity and message efficacy illustrate the need for replications and further examinations in different cultural settings. Our analysis was also limited to only three message factors. Future investigations should also test the influence of other threat (e.g., susceptibility) or efficacy (e.g., response efficacy) components and other evidence types or formal message feature on recipients’ selective exposure to health messages. Particularly susceptibility as a health message factor should be included in such investigations, as it is likely that individuals will ignore messages about health threats if they do not perceive themselves to be at risk, and vice versa (e.g., Witte, 1992).

Toward Improved Assessments of Health Messages’ Real-Life Effectiveness

As discussed, deriving hypotheses about health message effectiveness solely from forced-exposure media effect studies is problematic, since such investigations cannot account for humans’ strong “tendency to avoid, ignore, or deny

information” (Case, Andrews, Johnson, & Allard, 2005, p. 354) in real-live media use settings. The current investigation indeed demonstrated that using recommendations from popular health behavior models regarding health message development could result in health messages that the audience may rather circumvent than actually read. Message effectiveness examinations from a selective exposure perspective like the current study, however, are similarly limited. While they can reveal exposure or avoidance preferences, which naturally limit or enhance health messages’ effectiveness, they usually do not provide any quantification of intended or unintended health message effects (e.g., adaptation of health-protective behaviors, knowledge acquisition, or reactance). In order to develop effective messages that are better suited to motivate recipients to protect themselves from easily preventable health risks, it seems overdue to integrate the traditional concepts of message exposure (e.g., selective exposure paradigm) and message effectiveness (e.g., experimental media effects paradigm) into a cohesive framework that can guide health communication efforts. In theoretical terms, a health message’s potential to foster or limit selective exposure should be acknowledged as a vital precondition of its overall effectiveness and therefore explicitly incorporated in effectiveness judgments as well as in related theoretical frameworks. Message effectiveness assessments should not be solely based on forced-exposure studies but instead should take the target group’s specific exposure and avoidance preferences into account. Albeit theoretically compelling, such integration is not without serious empirical challenges. Information about individuals’ specific health message exposure or avoidance patterns is still hardly available, while the incorporation of valid measures for both message exposure and message effects in experimental investigations presents challenges. The advantages of a theoretical as well as empirical integration of both research traditions are manifold, however, and socially significant. We currently cannot rule out that huge resources are wasted every year by communicating suboptimal health messages that work—to some extent—in forced-exposure settings, but much less in real-world media environments in which other message types might be much more effective. A stronger focus on exposure and avoidance preferences and how they differ by cultures and target groups is therefore essential to improve the real-world effectiveness of health messages.

REFERENCES

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50, 179–211.
- Allen, M., & Preiss, R. W. (1997). Comparing the persuasiveness of narrative and statistical evidence using meta-analysis. *Communication Research Reports*, 14, 125–131.
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice Hall.
- Bandura, A. (2004). Health promotion by social cognitive means. *Health Education & Behavior*, 31, 143–164.
- Bandura, A. (2007). Self-efficacy in health functioning. In S. Ayers, A. Baum, C. McManus, S. Newman, K. Wallston, J. Weinman & R. West (Eds.), *Cambridge handbook of psychology, health and medicine* pp. 191–193. Cambridge, UK: Cambridge University Press.
- Blödmann, S., Gerhards, M., & Klingler, W. (2005). Informationsnutzung und Medienauswahl: Ergebnisse einer Repräsentativbefragung zum Informationsverhalten der Deutschen [transl.: Information use and media choice: Findings of a representative survey about Germans’ information use]. *Media Perspektiven*, 12/2005, 638–646.
- Brashers, D. E., Goldsmith, D. J., & Hsieh, E. (2002). Information seeking and avoiding in health contexts. *Human Communication Research*, 28, 258–271.
- Case, D. O., Andrews, J. E., Johnson, J. D., & Allard, S. L. (2005). Avoiding versus seeking: The relationship of information seeking to avoidance, blunting, coping, dissonance, and related concepts. *Journal of the Medical Library Association*, 93, 353–362.
- Cismaru, M., & Lavack, A. M. (2007). Interaction effects and combinatorial rules governing protection motivation theory variables: A new model. *Marketing Theory*, 7, 249–270.
- de Hoog, N., Stroebe, W., & de Wit, J. B. F. (2007). The impact of vulnerability to and severity of a health risk on processing and acceptance of fear-arousing communications: A meta-analysis. *Review of General Psychology*, 11, 258–285.
- de Wit, J. B. F., Das, E., & Vet, R. (2008). What works best: Objective statistics or a personal testimonial? An assessment of the persuasive effects of different types of message evidence on risk perception. *Health Psychology*, 27, 110–115.
- Dillman Carpentier, F. R. (2008). Applicability of the informational utility model for radio news. *Journalism and Mass Communication Quarterly*, 85, 577–590.
- Donsbach, W. (2009). Cognitive dissonance theory—A roller coaster career: How communication research adapted the theory of cognitive dissonance. In T. Hartmann (Ed.), *Media choice: A theoretical and empirical overview* (pp. 128–149). New York, NY: Routledge.
- Eilders, C. (2006). News factors and news decisions: Theoretical and methodological advances in Germany. *Communications*, 31, 5–24.
- Festinger, L. (1957). *A theory of cognitive dissonance*. Stanford, CA: Stanford University Press.
- Fox, S. (2005). *Health information online*. Washington, DC: PEW Internet & American Life Project.
- Gelbrich, K., & Schröder, E.-M. (2008). *Werbewirkung von Furchtappellen: Stand der Forschung* [transl.: Advertisement effects of fear appeals: The state of research]. Ilmenau, Germany: ProWiwi.
- Goldenberg, J. L., & Arndt, J. (2008). The implications of death for health: A terror management health model for behavioral health promotion. *Psychological Review*, 115, 1032–1053.
- Henke, K.-D. (2009). Health service research in Germany. In R. M. Mullner (Ed.), *Encyclopedia of health services research* (pp. 571–573). Thousand Oaks, CA: Sage.
- Henrich, G., & Herschbach, P. (2000). Questions on life satisfaction (FLZ^M): A short questionnaire for assessing subjective quality of life. *European Journal of Psychological Assessment*, 16, 150–159.
- Hinnant, A. (2009). Health and medicine journalism. In C. H. Sterling (Ed.), *Encyclopedia of journalism* (S. 691–695). Los Angeles, CA: Sage.
- Hoeken, H. (2001). Anecdotal, statistical, and causal evidence: Their perceived and actual persuasiveness. *Argumentation*, 15, 425–437.
- Hoeken, H. (2004, May). *The influence of exemplars in fear appeals on the perception of self-efficacy and message acceptance*. Paper presented at the annual meeting of the International Communication Association (ICA), New Orleans, LA.
- Hornik, R. C. (2002). Public health communication: Making sense of contradictory evidence. In R. C. Hornik (Ed.), *Public health communication: Evidence for behavior change* (pp. 1–19). Mahwah, NJ: Lawrence Erlbaum Associates.
- Hinyard, L. J., & Kreuter, M. W. (2007). Using narrative communication as a tool for health behavior change: A conceptual, theoretical, and empirical overview. *Health Education & Behavior*, 34, 777–792.

- Jerusalem, M. (2002). Gesundheitsförderung in Schule und Elternhaus [transl.: Health promotion in school and at home]. In R. Schwarzer, M. Jerusalem, & H. Weber (Eds.), *Gesundheitspsychologie von A bis Z: Ein Handwörterbuch* [transl.: Health psychology from A to Z: A dictionary] (pp. 171–174). Göttingen, Germany: Hogrefe.
- Kazarian, S. S., & Evans, D. R. (Eds.). (2001). *Handbook of cultural health psychology*. San Diego, CA: Academic Press.
- Kline, K. N. & Mattson, M. (2000). Breast self-examination pamphlets: A content analysis grounded in fear appeal research. *Health Communication*, 12, 1–21.
- Knobloch, S., Grimmer, D., Hastall, M., & Brück, J. (2004, May). *Predicting selective exposure to media information: The efficacy dimension in the informational-utility model*. Paper presented at the annual meeting of the International Communication Association (ICA), New Orleans, LA.
- Knobloch-Westerwick, S. (2006). Mood management: Theory, evidence, and advancements. In J. Bryant & P. Vorderer (Eds.), *The psychology of entertainment* (pp. 239–254). Mahwah, NJ: Lawrence Erlbaum Associates.
- Knobloch-Westerwick, S. (2008). Informational utility. In W. Donsbach (Ed.), *International encyclopedia of communication* (pp. 2273–2276). Oxford, UK: Wiley-Blackwell.
- Knobloch-Westerwick, S. & Hastall, M. (2006). Social comparisons with news personae: Selective exposure to news portrayals of same-sex and same-age characters. *Communication Research*, 33, 262–284.
- Knowles, E. S., & Linn, J. A. (2004). Approach–avoidance model of persuasion: Alpha and omega strategies for change. In E. S. Knowles & J. A. Linn (Eds.), *Resistance and persuasion* (pp. 117–148). Mahwah, NJ: Lawrence Erlbaum Associates.
- Kreuter, M. W. (2008). Culture and health communication. In W. Donsbach (Ed.), *The international encyclopedia of communication* (pp. 1133–1137). Malden, MA: Wiley-Blackwell.
- Larkey, L. K., & Hecht, M. (2010). A model of effects of narrative as culture-centric health promotion. *Journal of Health Communication: International Perspectives*, 15, 114–135.
- Lee, S. Y., Hwang, H., Hawkins, R., & Pingree, S. (2008). Interplay of negative emotion and health self-efficacy on the use of health information and its outcomes. *Communication Research*, 35, 358–381.
- Leventhal, H. (1970). Findings and theory in the study of fear communication. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 5, pp. 119–186). New York, NY: Academic Press.
- Limon, M. S., & Kazoleas, D. C. (2004). A comparison of exemplar and statistical evidence in reducing counter-arguments and responses to a message. *Communication Research Reports*, 21, 291–298.
- Maddux, J. E., & Rogers, R. W. (1983). Protection motivation and self-efficacy: A revised theory of fear appeals and attitude change. *Journal of Experimental Social Psychology*, 19, 469–479.
- Murray-Johnson, L., & Witte, K. (2003). Looking toward the future: Health message design strategies. In T. L. Thompson, A. M. Dorsey, K. I. Miller, & R. Parrott (Eds.), *Handbook of health communication* (pp. 473–495). Mahwah, NJ: Lawrence Erlbaum Associates.
- Nabi, R. L., Roskos-Ewoldsen, D., & Carpentier, F. (2008). Subjective knowledge and fear appeal effectiveness: Implications for message design. *Health Communication*, 23, 191–201.
- Newspaper Association of America. (2011). *Aggregated U.S. newspaper web site audience: comScore*. Retrieved from <http://www.naa.org/TrendsandNumbers/Newspaper-Websites.aspx>.
- Noar, S. M. (2008). Communication in health campaigns. In W. Donsbach (Ed.), *The international encyclopedia of communication* (pp. 2063–2070). Oxford, UK: Blackwell.
- Organisation for Economic Co-Operation and Development. (2010). *Health at a glance 2010: OECD indicators*. Paris: OECD.
- O'Keefe, D. J. (2003). Message properties, mediating states, and manipulating checks: Claims, evidence, and data analysis in experimental persuasive message effects research. *Communication Theory*, 13, 251–274.
- Pease, M. E., Brannon, L. A., & Pilling, V. K. (2006). Increasing selective exposure to health messages by targeting person versus behavior schemas. *Health Communication*, 19, 231–240.
- Peinado, S. (2009, May). *Threat and efficacy messages in newspaper articles on heart disease and type 2 diabetes*. Paper presented at the annual meeting of the International Communication Association (ICA), Chicago, IL.
- Peterson, R. A. (2001). On the use of college students in social science research: Insights from a second-order meta-analysis. *Journal of Consumer Research*, 28, 450–461.
- Reinhart, A., & Feeley, T. (2007, November). *Comparing the persuasive effects of narrative versus statistical messages: A meta-analytic review*. Paper presented at the annual meeting of the NCA 93rd Annual Convention, Chicago, IL.
- Roskos-Ewoldsen, D. R., Yu, H., & Rhodes, N. (2004). Fear appeal messages affect accessibility of attitudes toward the threat and adaptive behaviors. *Communication Monographs*, 71, 49–69.
- Rimal, R. N., & Adkins, A. D. (2003). Using computers to narrowcast health messages: The role of audience segmentation, targeting, and tailoring in health promotion. In T. L. Thompson, A. M. Dorsey, K. I. Miller, & R. Parrott (Eds.), *Handbook of health communication* (pp. 497–513). Mahwah, NJ: Lawrence Erlbaum Associates.
- Rimal, R. N., & Real, K. (2003). Perceived risk and efficacy beliefs as motivators of change. *Human Communication Research*, 29, 370–399.
- Rogers, R. W. (1975). A protection motivation theory of fear appeals and attitude change. *Journal of Psychology*, 91, 93–114.
- Rosenstock, I. M. (1960). What research in motivation suggests for public health. *American Journal of Public Health*, 50, 295–302.
- Rosenstock, I. M., Strecher, V. J., & Becker, M. H. (1988). Social learning theory and the health belief model. *Health Education Quarterly*, 15, 175–183.
- Sheer, V. C., & Chen, L. (2008). Intrinsic characteristics of health-related fear appeals from Chinese print OTC ads: Implications for fear message construction. *International Journal of Communication*, 2, 936–958.
- Shi, L., & Singh, D. A. (2010). *Essentials of the U.S. health care system*. Boston, MA: Jones & Bartlett.
- Stroebe, W. (2000). *Social psychology and health*. Buckingham, UK: Open University Press.
- Turner, M. M., Rimal, R. N., Morrison, D., & Kim, H. (2006). The role of anxiety in seeking and retaining risk information: Testing the risk perception attitude framework in two studies. *Human Communication Research*, 32, 130–156.
- Viswanath, K., Blake, K. D., Meissner, H. I., Saiontz, N. G., Mull, C., Hesse, B., & Croyle, R. T. (2008). Occupational practices and the making of health news: A national survey of U.S. health and medical science journalists. *Journal of Health Communication*, 13, 759–777.
- Weinstein, N. D. (1988). The precaution adoption process. *Health Psychology*, 7, 355–386.
- Witte, K. (1992). Putting the fear back into fear appeals: The extended parallel process model. *Communication Monographs*, 59, 329–349.
- Witte, K., & Allen, M. (2000). A meta-analysis of fear appeals: Implications for effective public health campaigns. *Health Education & Behavior*, 27, 591–615.
- World Health Organization. (2005). *Effective media communication during public health emergencies: A WHO field guide*. Geneva, Switzerland: World Health Organization.
- World Health Organization. (2010). *World health statistics 2010*. Geneva, Switzerland: WHO Press.
- Zillmann, D. (2000). Mood management in the context of selective exposure theory. In M. E. Roloff (Ed.), *Communication yearbook 23* (pp. 103–123). Thousand Oaks, CA: Sage.
- Zillmann, D. (2006). Exemplification effects in the promotion of safety and health. *Journal of Communication*, 56, S221–S237.
- Zillmann, D., & Brosius, H.-B. (2000). *Exemplification in communication: The influence of case reports on the perception of issues*. Mahwah, NJ: Lawrence Erlbaum Associates.