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The “celebrity canary in the coal mine for the coronavirus”: An examination of a theoretical model of celebrity illness disclosure effects

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ABSTRACT

Rationale: On March 11, 2020, actor Tom Hanks announced via social media that he had been diagnosed with COVID-19. Previous research has found celebrity illness disclosures to influence behavior, but during the uncertainty of a pandemic, the effects of such a disclosure were unclear.

Objective: To test the proposed Celebrity Illness Disclosure Effects (CIDE) model, demonstrating how an illness disclosure, communicated through mediated and interpersonal channels, may shape willingness to engage in prevention behaviors.

Methods: We conducted an online survey (N = 587) 24 hours after Hanks’ COVID-19 disclosure.

Results: Findings revealed that celebrity-related perception variables predicted illness-related cognitions and emotions, which were associated with willingness to enact prevention behaviors. Greater willingness to seek information, stronger perceptions of COVID as a threat, and stronger perceptions of efficacy for dealing with COVID after learning of Hanks’ diagnosis predicted stronger willingness to enact prevention behaviors. However, anxiety about COVID predicted lower willingness to enact prevention behaviors.

Conclusions: The CIDE model can serve as a guide for future research in this area. The results can help scholars who aim to better understand the phenomena around celebrities and health communication as well as policy-makers who hope to ride the wave of star power to improved public health outcomes.

1. Introduction

A novel strain of the coronavirus, COVID-19, was identified in China on December 31, 2019, and then started to spread (World Health Organization, 2020). It spread to more than 140 countries in the two months that followed (Centers for Disease Control and Prevention, 2020). On Wednesday, March 11, the World Health Organization declared COVID-19 a global pandemic, and that evening, then-U.S. President Donald Trump gave a televised speech from the Oval Office announcing travel restrictions, supply shortages, and increased testing efforts (Politico, 2020).

That same evening, Tom Hanks, a globally popular actor, posted on social media that he and his wife, actress Rita Wilson, tested positive for COVID-19 (Hanks, 2020). Hanks later joked that he was the “celebrity canary in the coal mine for the coronavirus,” as he was one of the first famous public figures to be diagnosed (Vo, 2020). Celebrities, like Hanks, have long been studied for their potential impact on public health (e.g., Brown and Basil, 1995; Cohen and Hoffner, 2016; Myrick et al., 2014). When media discuss a celebrity’s illness, the audience’s relationship with the celebrity can shape health attitudes, intentions, and behaviors (Ayers et al., 2014; Brown and Basil, 2010; Noar et al., 2014). The overarching research question we aim to address in the present study is how news of a popular celebrity contracting COVID-19 may spark a myriad of emotional, cognitive, and communication-oriented responses in audiences that, in turn, may shape subsequent COVID-19-related prevention activities.

Theoretically, there are gaps in the current literature regarding how mediated celebrity illness announcements affect the public. That is, existing research in this area has examined the interplay of emotions and communication-related outcomes without thoroughly considering the related illness-related cognitions (i.e., threat and efficacy perceptions) that have also been shown to be important predictors of health-related attitudes and behaviors. Our goal was to integrate theoretical perspectives on how public figures may shape audience health-related communication and behaviors while audience-related variables may also shape these mechanisms of effects, which we present as the
Celebrity Illness Disclosure Effects (CIDE) model.

1.1. Literature review

When someone gets sick, our response to learning of that illness likely depends on our relationship with the ill person. When considering how people relate to celebrities, research suggests that through media coverage about a celebrity we can become psychologically involved with them (Brown, 2015). *Audience involvement* is an umbrella term used to describe the various ways in which audiences form psychological connections with a mediated persona (Brown, 2015; Noar et al., 2014). Common forms of audience involvement include identification, which is an overlap between one’s identity and that of the media persona, and parasocial relationship, or imagining the media persona like a real-life friend (Brown, 2015). Audience involvement is important because it can motivate people to change health-related behaviors after learning about a celebrity diagnosis or death (Brown and Basil, 1995).

Theoretically, this connection between audience involvement and post-disclosure behavior change can be tied to social cognitive theory’s predictions about the power of identifying with a role model (Bandura, 1986, 2004). This theory argues that observers (in our case, media audiences) often learn vicariously by viewing a model’s action and the consequences of that action (Bandura, 2001). Studies of audience reactions to media about celebrity health issues have shown that identification with a celebrity can motivate audiences to take health-related actions (Basil, 1996; Brown and Basil, 2010). Furthermore, parasocial relationships or attachments with celebrities can also foster increases in health-related information seeking and interpersonal communication, and sharing about health topics (Cohen and Hoffner, 2016; Myrick, 2017a, 2020; Myrick et al., 2014). Noar et al. (2014) offered an overview of previous theorizing and empirical work to guide future research on audience responses to celebrity illness disclosures. Although their model was based on public figure announcements about cancer, the work has implications for other contexts. In their model, once people are exposed to a public figure illness announcement, audience involvement is a key facilitator of subsequent emotions, cognitions, and communication activities, which they argue serve as a “naturally occurring” intervention (Noar et al., 2014, p. 456).

Indeed, meta-analysis shows that audience involvement with celebrities who announce an illness consistently have a positive relationship with public intentions to change behavior (Kresovich and Noar, 2020). In line with previous research, we offer an initial replication hypothesis to test in the context of Hanks’ COVID-19 disclosure before delving into the nuances of subsequent processes and outcomes related to celebrity illness disclosures:

**H1:** Stronger audience involvement with Hanks (parasocial relationship and identification) will predict higher levels of COVID-19-related (a) emotional associations (anxiety and hope), (b) cognitions (threat and efficacy), (c) interpersonal communication, and (d) information seeking.

1.2. Emotions, cognitions, and celebrity illness disclosure effects

Nabi (2010) conceptualizes emotions as “internal mental states representing evaluative valenced reactions to events, agents, or objects that vary in intensity” (p. 153). Emotions are important to understand and include in theoretical models of celebrity illness disclosure effects because they can motivate behavior. When an audience member identifies with a mediated persona or experiences a parasocial relationship with them, the fate of that celebrity likely becomes more relevant to their own life. Perceived personal relevance of a situation is also a precursor to emotion evocation—if people do not perceive a situation to be relevant, then they are unlikely to experience strong emotions (Lazarus, 1991). Previous research suggests this phenomenon is also the case for celebrity illness disclosures or deaths, with audience involvement serving to increase the personal relevance of the situation (Myrick et al., 2014; Myrick et al., 2013). As suggested in the Noar et al. (2014) model of potential public figure illness announcement effects, emotions can serve as mediators of the effects of an illness disclosure on subsequent thoughts and behaviors, and this has bared out repeatedly in the research. For instance, individuals who identified with Apple founder and CEO Steve Jobs felt greater levels of cancer-related anxiety, which in turn was associated with an increased likelihood to seek information and talk to others about pancreatic cancer (Myrick et al., 2014).

To date, research on celebrity illness disclosure effects has primarily focused on single affective responses (e.g., anxiety or empathy; see Myrick et al., 2014 or Francis et al., 2019) to disclosures or deaths, but individuals can have multiple and nuanced emotional responses to these events, particularly depending on the tone the celebrity takes. For example, an experimental study demonstrated that when a celebrity uses a positive frame to announce an illness, audiences can experience both hope and anxiety-related emotional responses (Myrick, 2015). It may very well be that audiences who are more involved with a celebrity, either through identification or a parasocial relationship, may experience a more personalized, and therefore stronger, emotional response to learning of their illness than do audiences who do not relate closely to the celebrity, leading to another hypothesis:

**H2:** Stronger audience involvement with Hanks (parasocial relationship and identification) will predict stronger (a) anxiety and (b) hope after learning about his COVID-19 diagnosis.

It is difficult to discuss emotional responses without also considering how cognitions shape audience reactions to celebrity illness disclosures. Emotions and cognitions are intertwined concepts that, together, can explain even more variance in media effects on behavior than can either one on its own (Nabi, 2010). In fact, psychological models of emotion often consider automatic cognitive evaluations of our situation (called “appraisals”) as important for helping to determine our emotional responses as well as the higher order cognitions (e.g., threat and efficacy perceptions) that flow from initial emotional responses (Han et al., 2007; Lazarus, 1991; Nabi, 2003).

When considering a mix of cognitive and affective responses to health messages, another relevant theory is the Extended Parallel Process Model (EPPM; Witte, 1992), which has been repeatedly applied to health message effects (e.g., Goodall and Reed, 2013; So, 2013) and argues that the emotional reaction of fear or anxiety as well as cognitive reactions to a message containing a threat (i.e., perceived severity, which is how serious one believes the threat to be; perceived susceptibility, which is how great they feel the risk is to them; response efficacy, which is the idea that engaging in a behavior can make a difference on the outcome of interest; and self-efficacy, which is one’s confidence in their ability to complete the desired action) help determine whether audiences will enact adaptive behaviors. So (2013), in extending the EPPM, makes the argument that anxiety is an important emotion to study in the context of health message effects given it is, according to appraisal theory (Lazarus, 1991), our response to situations that we perceive as an uncertain, existential threat, whereas fear is more often associated with immediate, concrete physical danger.

Additional research makes the case for considering hope as the likely affective response to the efficacy information (e.g., you can avoid or overcome this illness) because hope is related to efficacy cognitions and motivates people to pursue their goals (Nabi and Myrick, 2019). In sum, understanding how audience involvement with a celebrity disclosing an illness may shape subsequent threat and efficacy cognitions related to the celebrity’s specific illness as well as their associated affective responses (i.e., anxiety and hope about the illness) could help advance the literature on celebrity illness disclosure effects.

Health-specific cognitions, such as threat and efficacy perceptions, have been repeatedly tied to stimulus-dependent emotions and health outcomes in theoretical models like the EPPM (Witte, 1992) as well as empirical reviews of emotion- and cognition-related message effects (Tannenbaum et al., 2015). As such, a complete model of celebrity illness disclosure effects should also include the relationships between
multiple types of emotional responses and related health cognitions. As such, we expect emotional responses to learning about Hanks’ COVID-19 diagnosis could also predict cognitions related to this illness. In general, anxiety is linked with stronger threat-related cognitions (So et al., 2015) while hope can facilitate perceptions of increased efficacy (Nabi and Myrick, 2019), leading to the following hypotheses:

H3: Stronger anxiety responses to Hanks’ illness disclosure will predict (a) stronger COVID-19-related anxiety and (b) threat perceptions, but (c) weaker COVID-19 efficacy perceptions.

H4: Stronger hope responses to Hanks’ illness disclosure will predict (a) weaker COVID-19 threat perceptions and (b) stronger COVID-19-related hope and (c) efficacy perceptions.

Although it is less clear which emotional responses may be tied to certain outcomes, the EPPM (Witte, 1992) posits that, together, high levels of perceived threat and perceived efficacy foster adaptive behavior change, leading to an additional hypothesis:

H5: Stronger cognitive perceptions of COVID-19 (threat and efficacy) will predict greater willingness to engage in COVID-19 prevention behaviors.

1.3. Emotional associations

So far, we have discussed emotional responses to Hanks’ disclosure as well as emotional associations with a specific illness. In considering the important role of immediate, short-lived emotional responses to Hanks’ COVID-19 disclosure, we also aim to differentiate these psychological states from the emotional associations individuals likely have formed with the specific illness (in this case, COVID-19). That is, while emotions are immediate and short-lived, various emotion theorists have also argued that individuals form “affective-cognitive structures” (Izard, 1977, 1984) or an “ideo-affective posture” (Tomkins, 1984) in response to repeated experiences of certain emotions alongside exposure to particular concepts or events (Nabi, 2003). This evidence means that we can form emotional associations with illnesses that are conceptually different from any specific event related to that illness, like a celebrity being diagnosed with it. These illness-related “ideo-affective postures” can, theoretically, be influenced by these specific illness-related events (like celebrity disclosures) but are different conceptually.

In the context of Hanks’ COVID-19 disclosure, emotional responses to hearing the news of his diagnosis are different from the emotional associations individuals have with the illness itself, for which they have a broader area of previous experiences and beliefs. However, after the celebrity illness disclosure, those post-disclosure emotions are one such part of the individual’s experience with the illness that can then contribute to the “ideo-affective” emotional associations audiences hold toward an illness. That is, new information and the emotional responses to that specific new piece of information can change your emotional associations toward other targets.

For example, learning that a romantic partner has cheated on you likely makes you angry, and that anger tied specifically to the new piece of information dampens the love-related emotional association you previously felt toward that person. Following the same logic, you could instead learn that your romantic partner has planned a surprise vacation for you, resulting in immediate feelings of happiness that then reinforce or intensify the love-related emotional association you have with your partner. In the present context, the emotions typically studied in celebrity illness disclosures are related to the celebrity disclosure event itself, whereas the emotions typically assessed in studies employing an EPPM framework are linked to the illness. As such, in joining these perspectives, we note this conceptual difference. The process whereby emotional responses to specific new pieces of information (in this case, an illness disclosure) help shape broader emotional associations with an illness, leads us to an additional hypothesis:

H6: Greater (a) anxiety and (b) hope associated with COVID-19 will predict greater willingness to engage in COVID-19 prevention behaviors.

1.4. Interpersonal communication and information seeking

The Noar et al. (2014) model of public figure illness announcement effect also posits that interpersonal communication about the illness is a crucial consideration for understanding how these announcements affect the public. Previous research examining how media coverage of a celebrity illness or death affects audiences has looked at communication-oriented behaviors like interpersonal communication and information seeking as one outcome of such disclosures. For instance, research has found that audience involvement with celebrities can facilitate health-related information seeking (Dillman Carpenter and Parrott, 2016; Francis et al., 2019; Myrick et al., 2014).

Emotional responses to learning about the death or illness of a celebrity are likely motivational forces shaping these communication-oriented behaviors. For example, multiple analyses of responses to Apple CEO Steve Jobs’ death from pancreatic cancer found that audience involvement directly predicted both talking to other people about pancreatic cancer and seeking more information about the illness, but also that these effects were partially mediated through emotional responses to learning the news (Myrick et al., 2013, 2014). Additional research found that empathy for actor Charlie Sheen, who announced he was HIV positive, was associated with interpersonal communication with others about this news, which in turn was associated with HIV testing intentions (Francis et al., 2019). Another study found that both audience involvement and emotional responses to learning about sportscaster Stuart Scott’s cancer death likewise was associated with sharing information about him via social media and other channels (Myrick, 2017a). This body of research leads to the following hypothesis:

H7: Stronger emotional responses (anxiety and hope) to Hanks’ COVID-19 disclosure will partially mediate the relationship between audience involvement and (a) interpersonal communication and (b) information seeking about COVID-19.

Interpersonal communication may be a precursor to subsequent beliefs and behaviors regarding the relevant health threat itself (Noar et al., 2014). Research on health communication campaigns indicate that the effectiveness of the campaign can be bolstered by people talking about it (Southwell and Yzer, 2007; van den Putte et al., 2011). Individuals who engage in behaviors like texting a friend about the celebrity illness disclosure may likewise be engaging in a communicative form of the “foot in the door phenomenon” (Burger, 1999; Comello et al., 2016; Dolin and Booth-Butterfield, 1995), whereby people who perform small tasks (like texting a friend) are more likely to later comply with larger, more involved tasks related to the same topic (like staying home and social distancing) to remain consistent with the type of person they perceive themselves to be. Although talking to another person after learning of a celebrity illness disclosure is not the result of a request, being aware that one did talk about the illness may subconsciously shape the expectation that the illness and preventing it is important, thereby facilitating consistency in one’s eventual illness-related behavior. This leads to another hypothesis:

H8: Greater interpersonal communication about COVID-19 after Hanks’ illness disclosure will be associated with greater willingness to engage in COVID-related prevention behaviors.

Similar to interpersonal communication, information seeking is an important behavior in health and risk communication research and can be a precursor to health behavior change generally (Dunwoody and Griffin, 2015; Myrick, 2017a) and also in the specific context of reactions to news of celebrity illness or death (Noar et al., 2014). Hanks’ COVID diagnosis could spark interest or motivation to seek additional information about the illness. With additional information, individuals may then be more willing to enact prevention behaviors, leading to the following hypothesis:

H9: Greater information seeking about COVID-19 after Hanks’ illness disclosure will predict greater willingness to engage in COVID-related prevention behaviors.
Together, these predictions form an overarching theoretical model. Fig. 1 offers a visual representation of the proposed interplay of variables suggested by H1–9, forming the Celebrity Illness Disclosure Effects (CIDE) Model. This model integrates the proposed model by Noar et al. (2014) with research on illness-specific emotional associations and cognitions.

2. Methods

An online survey was used to address the hypotheses.

2.1. Procedures

On Wednesday, March 11, Hanks announced via social media that he and his wife, actress Rita Wilson, had tested positive for COVID-19 and were isolating in Australia. On Thursday, March 12, we launched our study via Amazon’s Mechanical Turk platform using the CloudResearch service (Litman et al., 2017). The lead researcher had an existing IRB exemption to conduct a survey on public reactions to celebrity illness announcements, which permitted a quick study launch. All data were collected approximately 24 h after Hanks’ initial social media announcement to help assure that emotional responses to hearing the news were recent in respondents’ minds. The survey was advertised as a questionnaire that would ask about responses to people and events in the news. It was limited to individuals who were at least 18 years old and currently residing in the United States. CloudResearch verified that IP addresses of respondents were located in the United States. Respondents actively consented to participate before being presented with the questionnaire. Based on duration of our pilot tests of the survey and based on the U.S. federal minimum wage ($7.25/hour), we compensated individuals $0.51 USD for their participation. Note that the actual duration (M = 13 min 12 s; SD = 7 min 53 s) was longer than anticipated and future research should consider higher compensation rates.

The questionnaire started with questions about demographics and political preferences before asking respondents questions to assess audience involvement with Hanks. Next, participants were asked if they had heard about Hanks’ recent diagnosis but were not told what it was. Those who responded “no” (n = 95) were automatically advanced by the Qualtrics software to the next section of the questionnaire to respond to a different set of questions (results reported elsewhere, see (Myrick and Willoughby, 2021)). Those who responded yes (n = 587), they had heard about Hanks’ recent diagnosis, are the focus of our analyses. They were next asked to write in an open-entry text box what the diagnoses were without looking up the information. Those who responded with some version of the illness name (e.g., coronavirus, COVID-19, the novel coronavirus, ‘rona, etc.), were retained. Respondents then were asked questions about how they felt and if they engaged in interpersonal conversations after learning the news. Additionally, participants were asked to reply to an open-ended prompt about their views on Hanks’ post (Myrick and Willoughby, 2021). Finally, they responded to questions about their current health status and willingness to seek information and perform behaviors that could prevent the further spread of COVID-19.

2.2. Participants

Of the 587 respondents who had heard of Hanks’ diagnosis, 57.2% identified as female, 42.2% as male, and 0.5% as non-binary and 77.5% reported their race as White, 10.6% as Black, 4.6% Hispanic/Latino(a), 11.6% as Asian, 1.4% as Native American/American Indian, and 1.7% as other (respondents could select more than one race/ethnicity). These respondents reported their current residence as being from 47 different states as well as from the District of Columbia. A majority of the respondents (62.2%) had at least a four-year bachelor’s degree and the average age was 40.70 years (SD = 13.14; Range = 18–78), and 5.6% were 65 or older. About a third (28.6%) identified as Republican (n = 168), 24.5% identified as politically independent (n = 144), and 46.8% identified as Democrats (n = 275). About half (53.7%) of those who had heard about Hanks’ diagnosis reported being a parent. Additionally, 2.6% stated they had been personally diagnosed with some type of lung disease, 3.1% had been diagnosed with heart disease, and 4.8% had been diagnosed with diabetes, underlying conditions that, at the time of data collection in March 2020, were thought to make people more susceptible to COVID-19 complications.

2.3. Measures

Unless otherwise noted, all items were assessed on 1–7 Likert-type scales ranging from “strongly disagree” to “strongly agree.” All latent variables were normally distributed.

Parasocial Relationship (PSR) with Hanks was measured with five items adapted from the celebrity-persona parasocial interaction scale (Bocarnea and Brown, 2007). Sample items included “I often feel as if I am a celebrity’s friend” (α = 0.90, M = 4.52, SD = 1.48).

Identification was measured with five items also adapted from the celebrity-persona identification scale (Bocarnea and Brown, 2007). Sample items included “I can easily relate to Tom Hanks” (α = 0.92, M = 4.03, SD = 1.53).

Emotional responses to Hanks’ disclosure were measured with three items per emotion after reading the stem “When you first heard that Tom Hanks had the coronavirus, how did you feel?”. Anxious (anxious,
worried, concerned; α = 0.86, M = 4.07, SD = 1.75); Hopeful (hopeful, optimistic, encouraged; α = 0.78, M = 2.63, SD = 1.53).

**Interpersonal communication** was measured with two items. The first, aiming to assess amount of interpersonal communication, asked participants who reported any interpersonal conversations about Hanks’ diagnosis to respond on a 7-point scale gauging how long they conversed with others: 30 min or less, More than 30 min–1 h, More than 1 h–2 h; More than 2 h–3 h; More than 3 h–4 h; More than 4 h–5 h; More than 5 h. Individuals who reported they did not spend time talking about Tom Hanks’ COVID-19 diagnosis were coded as a “0,” creating an 8-point scale ranging from 0 to 7 (M = 0.66, SD = 0.79). The second item assessing interpersonal communication gauged the breadth of conversations and was adapted from Francis et al. (2019) and asked “Who have you talked with about Tom Hanks’ coronavirus diagnosis? Please check all that apply” with the following response items: friend(s), significant other/spouse, family member(s) besides spouse/significant other, roommate(s), co-workers, health care providers, child, other. Each response was coded as one to make an additive index with the average respondent who had spoken with at least one other person (M = 1.07, SD = 1.13). The two interpersonal communication items assessing depth and breadth of conversation about Hanks’ illness were significantly and positively correlated (r = 0.71, p < .01, M = 0.92, SD = 0.89).

**Emotional associations with COVID-19** were assessed with three items assessing COVID-related anxiety (anxious, worried, concerned; α = 0.92, M = 4.58, SD = 1.77) and three items assessing COVID-related hope (hopeful, optimistic, encouraged; α = 0.87, M = 2.93, SD = 1.67) with the question stem: “How do you feel about the coronavirus?”

**Perceived COVID-19 threat.** Perceived COVID-19 severity was assessed with two items adapted from Witte et al. (1996): “The coronavirus is serious,” and “The coronavirus is severe.” Perceived susceptibility to COVID-19 was assessed with two more items adapted from Witte et al. (1996): “I am susceptible to getting the coronavirus; ” “I am at risk for getting the coronavirus.” Together, a PCA revealed these should be one factor and they formed a reliable index of perceived COVID-19 related threat (α = 0.82, M = 4.97, SD = 1.40).

**Perceived COVID-19 efficacy.** Perceived coronavirus prevention self-efficacy was measured with two items adapted from Witte et al. (1996): “I am able to avoid getting the coronavirus; ” “I am capable of avoiding the coronavirus.” **Perceived response efficacy** was measured with another two items from Witte et al. (1996): “There are effective actions for preventing the coronavirus; ” “It is possible to reduce the risk of getting the coronavirus.” Together, a PCA revealed these should be one factor and they formed a reliable index of perceived COVID-19 related efficacy (α = 0.86, M = 4.76, SD = 1.33).

**Information seeking** was assessed with five items that asked participants if they were willing (1 = not at all willing; 7 = very willing) to do the following: Seek more information about symptoms of the coronavirus; Seek more information about the spread of the coronavirus; Seek more information about who is at risk for the coronavirus; Seek more information about public policies to combat the coronavirus; Seek more information about ways individuals can prevent the coronavirus (α = 0.95, M = 5.78, SD = 1.39).

**Behavioral willingness.** Seven items assessed willingness to perform behaviors (1 = not at all willing; 7 = very willing) that could prevent COVID-19 based on the WHO’s and the CDC’s recommendations to prevent the spread of COVID-19: Regularly and thoroughly clean your hands with an alcohol-based hand rub or wash them with soap and water; maintain at least 3 feet distance between yourself and anyone who is coughing or sneezing; Avoid touching eyes, nose and mouth; Cover your mouth and nose with your bent elbow or tissue when you cough or sneeze; Stay at home if you begin to feel unwell, even with mild symptoms such as headache and slight runny nose, until you recover; If you have fever, cough and difficulty breathing, seek medical care promptly; Avoid large gatherings of people (α = 0.90, M = 6.18, SD = 1.02).

### 2.4. Analysis plan

First, bivariate correlations were run to assess which variables in the data set also correlated with behavioral willingness and would be important to include as potential control variables. Next, a measurement model and then a full structural equation model were conducted in Mplus Version 8.

### 3. Results

Bivariate correlations between all the latent variables in the proposed model demonstrated that most of the variables were significantly correlated (see Table 1). Next, we adopted a two-step modeling approach including a measurement model before testing a structural model (Kline, 2011). Although PSR and identification are theoretically distinct and have been tested as distinct concepts in previous research on responses to celebrities (Wen, 2017), their bivariate correlation was quite high (r = 0.89, p < .001). Therefore, we first constructed a measurement model with the respective indicator items predicting to two separate latent variables of PSR and identification: χ² = 3164.57, df = 847, p < .001; RMSEA = 0.068 (90% CI: 0.066, 0.071); CFI = 0.887, SRMR = 0.059. Next, we constructed a measurement model where all the indicators for PSR and identification predicted a single combined audience involvement variable: χ² = 3211.385, df = 857, p < .001; RMSEA = 0.068 (90% CI: 0.066, 0.071); CFI = 0.885, SRMR = 0.060. Although significant (p < .001), the difference in model fit was very small for a complex model with a large sample size (Δχ² = 46.815, Δdf = 10). Moreover, the modification indices of the original measurement model with PSR and identification as separate latent factors suggested that a number of the indicators for each item should cross-load onto the other factor. Given these modification indices and the high correlation between the latent variables, we proceeded with a measurement model that combined the two into one latent construct of audience involvement.

As such, the measurement model included the latent constructs of audience involvement, anxiety in response to Hanks’ disclosure, hope in response to Hanks’ disclosure, COVID-19 related anxiety, COVID-19 related hope, COVID-19 related threat, COVID-19 related efficacy, interpersonal communication, information seeking willingness, and behavioral willingness. The modification indices for this measurement model suggested that the following items should be allowed to correlate due to values of greater than 70: the two severity items of the threat scale; the two susceptibility items of the threat scale; the two self-efficacy items of the efficacy scale; the two response efficacy items of the efficacy scale; and two of the behavioral willingness items (‘Regularly and thoroughly clean your hands with an alcohol-based hand rub or wash them with soap and water’ and ‘Cover your mouth and nose with your bent elbow or tissue when you cough or sneeze’). The final measurement model included those five additional correlations between indicators suggested by the modification indices: χ² = 2103.148, df = 852, p < .001; RMSEA = 0.050 (90% CI: 0.047, 0.053; CFI = 0.939, SRMR = 0.052. Additionally, all items predicting latent variables had standardized loadings of 0.40 or higher.

Next, we ran the structural model with the latent variables aligned as predicted by our conceptual model: χ² = 2337.498, df = 871 p < .001; RMSEA = 0.054 (90% CI: 0.051, 0.056); CFI = 0.928, SRMR = 0.058. Furthermore, because the demographic and background variables of parent status (r = 0.08, p = .04), age (r = 0.17, p < .001), gender (woman versus male or non-binary; r = 0.20, p < .001), lung disease diagnosis (r = 0.08, p = .04) had significant bivariate correlations with our primary outcome of willingness to engage in COVID-19 prevention behaviors (while other potential controls like heart disease and diabetes diagnoses did not), we ran an additional structural model that included these items as exogenous variables predicting behavioral willingness. The SEM including the control variables explained more of the variance (53.7%) in behavioral willingness than the original structural model.
but all hypothesized paths were included in the analyses; IPC involvement directly predicted COVID-19 related anxiety (β = 0.26, p < .001) but it was not significantly related to COVID-19 related threat (β = -0.11, p = .15), so H3 was only partially supported.

H4 posited that feeling hopeful in response to learning of Hanks’ COVID-19 diagnosis would predict weaker COVID-19 related threat (β = 0.18, p < .001) and greater post-disclosure hope (β = 0.37, p < .001). H3 argued that anxiety in response to learning of Hanks’ COVID-19 diagnosis would predict stronger COVID-19 related threat (β = 0.94, p < .001) but it was not significantly related to COVID-19 related efficacy (β = -0.11, p = .15), so H3 was only partially supported.

H4 posited that feeling hopeful in response to learning of Hanks’ COVID-19 diagnosis would predict weaker COVID-19 related threat perceptions and stronger COVID-19 related hope and efficacy perceptions. Post-disclosure hope was a positive predictor of COVID-19 related hope (β = 0.78, p < .001), efficacy (β = 0.29, p < .001), and it was a negative predictor of COVID-19 related threat (β = -0.15, p < .01), fully supporting this prediction.

H5 argued that COVID-19 related cognitions would then predict greater willingness to engage in COVID-19 prevention behaviors. This hypothesis was fully supported as both COVID-19 related threat (β = 0.26, p < .05) and COVID-19 related efficacy (β = 0.19, p < .001) predicted behavioral willingness.

H6 argued that COVID-19 related emotional associations would then predict greater willingness to engage in COVID-19 prevention behaviors. This hypothesis was not supported; COVID-19 related hope did not predict behavioral willingness (β = -0.08, p = .07) while anxiety did, but in the opposite direction as predicted (β = -0.26, p < .05).

H7 suggested that emotional responses to Hanks’ disclosure would mediate the relationship between audience involvement and communication-related behaviors. To assess indirect effects, 5000 95% bias-corrected bootstrap samples were used (see Table 2 for the significant specific standardized indirect effects). The total indirect effect between audience involvement and interpersonal communication was positive and significant (β = 0.18, p < .001). This finding was driven by a significant specific indirect path from audience involvement to post-disclosure anxiety to interpersonal communication (β = 0.20, p < .001). The path via post-disclosure hope was not significant.

(50.1%) and the data fit our structural model well for a large sample: χ² = 2688.066, df = 1.043, p < .001; RMSEA = 0.052 (90% CI: 0.049, 0.054); CFI = 0.920; SRMR = 0.060 (see Fig. 2 for significant standardized paths).

H1 predicted that audience involvement with Hanks would predict illness-related cognitions, emotional associations, and communication behaviors. This hypothesis was only partially supported as audience involvement directly predicted COVID-19 related anxiety (β = -0.18, p < .05) and interpersonal communication (β = 0.16, p < .01) but did not directly predict COVID-19 related hope (β = -0.05, p = .39), COVID-19 related threat (β = -0.16, p = .16), COVID-19 related efficacy (β = 0.08, p = .26), or information seeking (β = -0.11, p = .16).

H2 predicted that audience involvement would also predict emotional responses to seeing Hanks’ illness disclosure, which was fully supported as stronger audience involvement predicted greater post-disclosure anxiety (β = 0.63, p < .001) and greater post-disclosure hope (β = 0.37, p < .001). H3 argued that anxiety in response to learning of Hanks’ COVID-19 diagnosis would predict stronger COVID-19 related anxiety and threat perceptions and weaker COVID-19 related efficacy perceptions. Post-disclosure anxiety was strongly predictive of COVID-19 related anxiety (β = 0.97, p < .001) and threat (β = 0.94, p < .001) but it was not significantly related to COVID-19 related efficacy (β = 0.11, p = .15), so H3 was only partially supported.

H4 posited that feeling hopeful in response to learning of Hanks’ COVID-19 diagnosis would predict weaker COVID-19 related threat

Table 1

| Variable | M   | SD  | Range | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|----------|-----|-----|-------|---|---|---|---|---|---|---|---|---|
| 1. Audience involvement | 4.32 | 1.46 | 1–7  | − |   |   |   |   |   |   |   |   |
| 2. Hanks anxiety | 4.07 | 1.75 | 1–7  | .58 | − |   |   |   |   |   |   |   |
| 3. Hanks hope | 2.63 | 1.53 | 1–7  | .37 | .26 | − |   |   |   |   |   |   |
| 4. Interpersonal communication | 0.92 | 0.89 | 0–5  | .34 | .40 | .09 | − |   |   |   |   |   |
| 5. COVID anxiety | 4.62 | 1.79 | 1–7  | .39 | .74 | .10 | .30 | − |   |   |   |   |
| 6. COVID hope | 2.77 | 1.61 | 1–7  | .19 | .10 | .73 | .08 | .05 | − |   |   |   |
| 7. COVID threat | 5.03 | 1.41 | 1–7  | .33 | .56 | .07 | .24 | .72 | .03 | − |   |   |
| 8. COVID efficacy | 5.21 | 1.41 | 1–7  | .10 | .00 | .21 | .01 | .09 | .29 | .01 | − |   |
| 9. COVID information seeking willingness | 5.85 | 1.35 | 1–7  | .25 | .44 | .05 | .23 | .54 | .03 | .54 | .01 | − |
| 10. COVID behavioral willingness | 6.29 | 0.89 | 2–7  | .17 | .28 | .02 | .19 | .32 | .01 | .43 | .08 | .65 |

a p < .05.
b p < .001.
Furthermore, the total indirect effect between audience involvement and behavioral willingness was positive and significant ($\beta = 0.36, p < .001$). As with interpersonal communication, this finding was driven by a significant specific indirect effect via post-disclosure anxiety ($\beta = 0.39, p < .001$) as both the effect via post-disclosure hope and the direct effect were not significant.

H8 predicted that interpersonal communication would lead to greater willingness to engage in COVID-19 prevention behaviors, but this relationship was not significant ($\beta = 0.03, p = .36$) and thus H8 was not supported. H9 posited that information seeking would predict stronger hope and anxiety responses to learning about his COVID-19 disclosure but less anxiety about the illness itself. Next, feeling anxious and/or hopeful after learning of the celebrity illness disclosure was also associated with emotional associations with and cognitions about the illness itself, while anxiety responses to Hanks’ disclosure was positively associated with interpersonal communication and willingness to seek information about COVID-19. Finally, of these intermediate variables, willingness to seek illness-related information, as well as threat and efficacy cognitions, predicted higher behavioral willingness, but illness-related anxiety predicted lower behavioral willingness.

One important contribution of this study was its theorizing and testing of multiple types of emotion-rated variables. We assessed both anxiety and hope responses to learning of Hanks’ COVID-19 diagnosis, as opposed to previous work that had focused on singular emotional responses. Audience involvement may serve as a personalizing mechanism; it makes the disease seem more relevant, thereby facilitating stronger emotional responses. While anxiety and hope responses to Hanks’ disclosure differ in their valence, they were both positively and significantly correlated, supporting the notion that audience involvement can intensify emotional responses and not dictate one type of response over another. According to appraisal theory (Lazarus, 1991), anxiety and hope are similar in that they are both based on uncertainty about the future. Theoretically, this conceptualization underscores the need to include multiple emotional responses in models of audience reactions to risk-related health messages and not over-focus on negative

4. Discussion

In our initial test of the Celebrity Illness Disclosure Effects model in the context of Tom Hanks’ March 2020 COVID-19 disclosure via social media, our results suggest that, for individuals who learn the news of a celebrity illness disclosure, a psychological relationship with that celebrity could potentially facilitate psychological states and evaluations that also help shape willingness to engage in protective health behaviors. First, audience involvement with Hanks was positively associated with stronger hope and anxiety responses to learning about his COVID-19 disclosure, as well as greater interpersonal communication about the disclosure but less anxiety about the illness itself. Next, feeling anxious and/or hopeful after learning of the celebrity illness disclosure was also associated with emotional associations with and cognitions about the illness itself, while anxiety responses to Hanks’ disclosure was positively associated with interpersonal communication and willingness to seek information about COVID-19. Finally, of these intermediate variables, willingness to seek illness-related information, as well as threat and efficacy cognitions, predicted higher behavioral willingness, but illness-related anxiety predicted lower behavioral willingness.

Furthermore, for public health purposes where predicting behavioral willingness is the primary goal, we ran an additional SEM where we dropped interpersonal communication and COVID hope as they did not predict this outcome. This more parsimonious model fit the data well: $\chi^2 = 2294.32, df = 831, p < .001$; RMSEA = 0.055 (90% CI: 0.052, 0.057); CFI = 0.922; SRMR = 0.062. As can be seen in Fig. 3, the results were very similar to the primary model with only small ($\Delta \beta = 0.01$) shifts in a few beta weights.

![Fig. 3. Parsimonious structural equation model. Note: *p < .05, **p < .01, ***p < .001; only relationships between latent variables are displayed for ease of viewing.](image-url)
emotions alone.

Second, we contributed to the literature on the role of affect and emotion in health communication by differentiating between these event-specific, short-lived emotional responses to a celebrity illness disclosure and emotional associations with the specific illness. While the two sets of concepts did have strong bivariate correlations with each other and post-disclosure emotions were strongly related to their corresponding illness-associated emotional evaluation in the SEM, the measurement model showed these concepts were different enough to keep separate in our structural analyses. While post-disclosure hope was associated with stronger COVID-19-related hope and efficacy but weaker COVID-related threat and anxiety in the SEM, post-disclosure anxiety was only related to higher levels of COVID-related threat and anxiety and not related to COVID-related hope or efficacy. However, post-disclosure anxiety also was positively associated with the communication-related variables of information-seeking willingness and interpersonal communication, whereas post-disclosure hope was not associated with these variables, demonstrating the importance of assessing multiple discrete emotions as they can have a different relationship with subsequent emotional associations, cognitions, and behaviors.

The indirect effects revealed that COVID-19 anxiety, threat, and efficacy all were important mediators of disclosure effects on behavioral willingness. Another result of interest was that, although there was a negative direct effect of COVID-19-related anxiety on behavioral willingness, the indirect effect from audience involvement to willingness via COVID-19 anxiety was small but positive ($β = 0.04, p < .05$). As such, the ability of audience involvement to dampen illness-related anxiety may help encourage preventative actions instead of merely working to lessen the aversive anxious state. Furthermore, both COVID-related efficacy and threat were positive predictors of behavioral willingness. This finding suggests that campaign designers may want to focus too much on the health threat at the expense of ignoring messaging components that also discuss how to avoid a health threat, too. By including both threat and efficacy in COVID-prevention mentions, our results suggest greater gains in behavior may be realized.

Another notable result from this study is the role of willingness to seek illness-related information, which is often treated as an outcome in celebrity illness effects research (e.g., Myrick et al., 2014), but in our study served as a predictor of behavioral willingness, too. Both information seeking and interpersonal communication are theorized to be intermediate steps that can help bridge the gap between message exposure (in this case, learning of Hanks’ COVID-19 disclosure) and health-related behavior change. The results also revealed that interpersonal communication after learning about Hanks’ diagnosis was not associated with willingness to perform COVID-19 prevention behaviors in the path model, although interpersonal communication did have a significant positive bivariate association with behavioral willingness. This finding could potentially be an example of health slacktivism, which occurs when individuals engage in minimal efforts, such as sharing one’s support of health causes with others without actually changing their behaviors (Hu, 2014). Or, it could imply that future work needs to take a more nuanced approach to measuring interpersonal communication and not just measure the amount or breadth of it but also the nature of it (e.g., what exactly did people talk about?). This finding may lead public health communicators to focus less on asking people to share the news of a celebrity illness disclosure with others and more on emphasizing other factors (disease threat, efficacy to avoid the disease, seeking accurate information about it) that were positive predictors of behavioral willingness.

Also, the CIDE model and the results presented here could inform strategic message design for organizations hoping to benefit from the increased public attention paid to an illness after a celebrity disclosure. Organizations could encourage seeking credible, easy-to-understand information about the illness by creating and promoting expert-curated websites since willingness to seek information is positively associated with behavioral willingness. They could also focus on themes of both threat and efficacy, and not one (e.g., too much threat leading to fear and avoidance or too much efficacy seeming too pollyanna-ish) or the other.

Communicators may want to target individuals who are likely to relate to an ill celebrity (perhaps those who already follow their social media accounts) and encourage them to share the information about the celebrity disclosure or illness risks with others in their social networks. Given that emotional responses were stronger for individuals who were more psychologically involved with the celebrity and intense emotions motivate people to share information (Berger and Milkman, 2012), this may be an easy target behavior to encourage with this group and can help resource-strapped public health organizations spread their messages further than with paid messaging alone.

4.1. Limitations and future research

Future work could employ more representative samples to gauge generalizable responses to celebrity health announcements during a global infectious disease pandemic. Additional research is needed to focus more on understudied populations dealing with the consequences of health disparities and to investigate demographics and other relevant psychosocial variables as additional moderators of celebrity illness disclosure effects. Although we did not assess actual behavior, previous research has found behavioral willingness to be strongly associated with health behaviors (Gibbons et al., 2009). Finally, the cross-sectional nature of our survey does not allow us to establish causal links between variables; future research could employ longitudinal and quasi-experimental designs.

5. Conclusions

Despite these limitations, the present study makes contributions to the literature on the role of celebrity-related media in shaping public responses to health crises. We were able to quickly measure public reactions to actions the first major U.S. celebrity announcement of a COVID-19 diagnosis and use that data as an initial test of the Celebrity Illness Disclosure Effects model. The CIDE model offers a theoretically grounded starting point for future research in this area that can explore the role of different contexts in shaping celebrity illness disclosure effects on public health. The results presented here can help scholars who aim to better understand the phenomena around celebrities and health communication as well as practitioners or policy makers who hope to ride the wave of star power to improved public health outcomes.

Data availability

The data that support the findings of this study are available from the corresponding author, JGM, upon reasonable request.

Credit author statement

Jessica Gall Myrick, Conceptualization, Methodology, Data Collection, Formal analysis, Writing, Editing. Jessica Fitts Willoughby: Conceptualization, Methodology, Writing, Reviewing, Editing.

Declaration of competing interest

The authors have no financial interests and no conflicts of interest.

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