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Perceived Knowledge as [Protective] Power: Parents' Protective Efficacy, Information-Seeking, and Scrutiny during COVID-19

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ABSTRACT

During the COVID-19 pandemic, parents were issued numerous, sometimes changing, safeguarding directives including social distancing, mask use, hygiene, and stay-at-home orders. Enacting these behaviors for the parent presented challenges, but the responsibility for children to follow protocol properly was an even more daunting undertaking. Self-efficacy is one of the most power predictors of health behavior and has been adapted to a context-specific crisis self-efficacy scale conducted on March 20, 2020, captures real-time perceptions of parents as coronavirus anxieties peaked. The study reveals a relationship between self- and protective efficacy that is mediated by parents' assessments of how informed they are about COVID-19. It also examines the role of perceived knowledge on information-seeking and scrutiny of pandemic information found online. Important directions for future research to develop the protective efficacy construct emerge as well as evidence of the rich applied and theoretical value of a deeper understanding of the perceived ability to perform recommended actions to protect another.

Global health threats such as West Nile, Zika, and Avian Flu challenged the public health community to prepare publics for a major health crisis in the face of myriad unknowns regarding transmission, susceptibility, and treatment, among other considerations. However, COVID-19, or coronavirus, has presented the public health community with unprecedented challenges in magnitude and scope. Public health researchers have an important opportunity – albeit terribly unwanted – to expand broadly the body of perceived knowledge on public health crisis management. As such, these contributions should extend well beyond previously tapped areas of crisis communication.

This article initiates one such novel area of inquiry and proposes a new concept of “protective efficacy” to inform public health interventions and theory. For decades, Bandura's (1977) concept of self-efficacy has been an incredibly useful predictor of pro-health behaviors in routine and crisis situations. Avery and Park (2016, 2019) have extended this work into the crisis domain with their work developing and testing a crisis self-efficacy scale across contexts including weather emergencies, food recalls, and epidemic. Crisis self-efficacy is the perceived ability to perform risk-reducing behaviors during a threat to protect oneself (Park & Avery, 2019). In the case of coronavirus, key safeguarding protocols include quarantine, wearing masks, hand sanitization, avoiding facial contact, and social distancing. Perceived self-efficacy inability to wear a mask is likely quite high as a volitional behavior; unless one does not have access to a mask, it is primarily up to the individual whether or not it is worn in public. However, consider if that same person has a child, family member, or elderly parent whom they want to protect. Insuring that a child is wearing a mask, and properly, in

public is a much more challenging endeavor. Parents may provide the child with a mask to wear in public, but whether it will remain on, be worn properly, or be worn without accompanying facial contact is a bigger challenge and often beyond parental control.

To extend the work on crisis self-efficacy, the concept of “protective efficacy” is explored here and conceptualized as the individual's perceived ability to protect a dependent “other” during a crisis. One of the biggest anxieties during the COVID-19 pandemic for parents is if and how they can best protect their children, especially as summer ended and school format (face-to-face or virtual) decisions loomed (Matheis, 2020). There are important implications for evaluating if and how crisis self-efficacy translates into perceived ability to protect others amidst crisis; unique strategic interventions can bolster adherence to safe-guarding protocols if parents' perceived abilities to protect those for whom they are responsible are enhanced. Strategic crisis messaging can increase self-efficacy levels (Frisby et al., 2013).

A national survey ($n = 500$) was conducted to explore the relationship between self-efficacy and protective efficacy. These data have strong external validity as they capture real-time perceptions on March 20, 2020, 9 days after the WHO declared coronavirus a pandemic, a week after 16 states closed schools, and the day after the U.S. Department of States issued a Level 4 “Do Not Travel” advisory (Kantis et al., 2020). In sum, anxiety and uncertainty were very high. Theoretically, this inquiry develops a novel theoretical construct, protective efficacy, to expand preparedness research in health crisis from self to the “other” for whom the self is responsible. Further, its applied value lies in that it can be extended to inform interventions to

bolster self-efficacy and, perhaps in turn, protective efficacy through its focus on information-seeking. Vulnerable publics and those who depend on others for protection, such as children and the elderly, need more visibility in crisis research. Amidst COVID-19 and other health crises, an enhanced sense of protective efficacy among parents may motivate them to gather risk-reducing information and more confidently invest in safeguarding practices. This early exploration into the concept of protective self-efficacy identifies the relationship between self- and protective efficacy and explores the role of information-seeking, an important component of self-efficacy, and its influence on protective self-efficacy.

Literature review

Self-efficacy

A review of extant literature in health information reveals the prominence of Bandura's (1977) concept of self-efficacy in theories, models, and research. Self-efficacy is operationalized as the individual assessment of behavioral and cognitive ability to perform a goal behavior or complete a task. As one of the most powerful predictors of human behavior (Rimal & Adkins, 2003), self-efficacy has been used to understand health behaviors such as smoking cessation (Thrasher et al., 2016; Travaglino et al., 2017), infant feeding (Bartle & Harvey, 2017), psychological distress (Loton & Waters, 2017), fruit consumption (Leung et al., 2017), indoor tanning (Mays & Evans, 2017), and pandemic flu (Lee & Park, 2016).

Self-efficacy influences every phase of behavioral change including information-seeking, how hard people try to perform a behavior once they decide to do so, how much they change, and how long they will maintain those changes (Schwarzer & Fuchs, 1996). So, the higher the level of self-efficacy, the more knowledgeable one may feel about a situation. The research on various preparedness programs consistently also reveals a close relationship between self-efficacy and crisis preparedness (Hoy & Spero, 2005; Paton, 2003; Uhernik, 2008).

Crisis self-efficacy

Given its relationship with preparedness, self-efficacy is an important construct in crisis management. It exerts strong influence on behavioral intentions to perform risk-reducing behaviors, and self-efficacy is an important consideration in enhancing audience compliance with safeguarding protocol before and during crisis (Avery & Park, 2016). Eden (2001) and Chen et al. (2001) argue that the power of behavioral predictability for a self-efficacy scale is contingent on a close match between scale and context; so, Park and Avery (2019) developed a context-specific scale to measure crisis self-efficacy, which is conceptualized as the individual's beliefs in his/her/their ability to successfully complete a given task during a crisis situation. Crisis self-efficacy has four dimensions: action (ability to perform protective behaviors), preventive (perceived level of preparedness), achievement (ability to accomplish goals), and uncertainty management (ability to deal with uncertainties (Park & Avery, 2019)).

The crisis self-efficacy scale, 2019 has promise as a useful predictor of *individual* performance of safeguarding behaviors during crisis. However, COVID-19 protocol made parents responsible for the risk-reducing behaviors of their children, too (e.g., wear a mask, socially distance, don't touch face, etc.). As noted earlier, an adult wearing a mask is a largely volitional behavior. However, enforcing that behavior in children is much more challenging. As the COVID-19 pandemic and accompanying directives unfolded rapidly, so too did parental anxieties over keeping their children safe. The question became, how does crisis-self efficacy relate to parents' evaluations of protective efficacy, or their perceived abilities to protect dependents through performance of recommended behaviors.

Protective efficacy is defined here as the perceived ability to complete a task to keep a dependent other safe during a crisis situation. Self-efficacy affects how people think and can impede or enhance their motivation to act; as Schwarzer and Fuchs (1996) note, high self-efficacy people perform more challenging tasks, set higher goals, and reach those goals. They exert more effort with more persistence in a task than those with low self-efficacy. People with high self-efficacy have heightened competence and confidence (Bandura, 1977); this sense of self-assurance and tenacity seems likely to translate into confidence in the ability to protect others as well. Thus, the following hypothesis is formulated:

H1: There is a positive relationship between crisis self-efficacy and protective efficacy.

Information-seeking increases self-efficacy and mediates the relationship between perceived susceptibility/anxiety and self-efficacy (So et al., 2019); perceived COVID-19 knowledge may reduce anxiety and enhance self-efficacy. Parents' COVID-19 perceived knowledge levels may exert important influence on their sense of protective efficacy. An (2007) reviews several studies that found perceived knowledge significantly affected HIV testing and condom use and also identified the effects of perceived knowledge on the relationship between direct-to-consumer advertising and inquiries or requests for that drug. An (2007) notes that the importance of the role of perception on behavioral intent is a prominent theme in health behavior theory, and higher perceived knowledge levels may give individuals the confidence to try new alternatives or behaviors.

Knowledge boosts self-efficacy and in turn one's confidence in ability to avert risks, and information is an important part of informing intervention strategy to increase preparedness. Risk messages can motivate health information-seeking; with that information, processing, acceptance, and behavioral adherence to safeguarding protocol are target outcomes. So et al. (2019) note, "theories of risk message design and effects (e.g., fear appeal models), however, have not considered information seeking as an integral part of the risk message processing" (p. 663).

This research addresses this absence in extant research by examining how information-seeking and knowledge, as important aspects of self-efficacy, influence protective efficacy, or the perceived ability to protect others. Frisby et al. (2014) found that people who watched a highly instructional video with specific safeguarding directives regarding foodborne illness

demonstrated higher levels of self-efficacy than those who saw standard messages, regardless of prior experience. Their data support the observation that information boosts self-confidence in ability to enact protective behaviors. In fact, there was a decrease in self-efficacy among those who watched the general video, perhaps because it led to fear or perceived helplessness in averting risk (Frisby et al., 2014). It follows that parents who are more informed about a threat feel more confident in their abilities to protect children, especially given that information and self-efficacy are positively related. Thus, the following predictions are made:

H2: There is a positive relationship between perceived COVID-19 perceived knowledge and protective self-efficacy.

H3: COVID-19 perceived knowledge level mediates the relationship between crisis self-efficacy and protective efficacy.

Pandemic perceived knowledge, information-seeking, and credibility of internet information

As noted, So et al. (2019) argue that the role of information-seeking in risk message processing needs more consideration. They note that the rigor of the scrutiny applied to the information garnered is of particular interest. To that end, parents' perceived abilities to evaluate the credibility of information they find online is important to understanding their protective efficacy. Coronavirus *misinformation* is abundant online; COVID-19 spurred rumors, conspiracy theories, resistance to science, and the politicization of public health. One study examined 2,311 COVID-19 online stories with possible misinformation and found that 89% of them could be classified as rumors (e.g., drinking bleach or exposure to extreme UV light as cures) (Islam et al., 2020). Consequences of this misinformation might include injury or even death, further underscoring the importance of parents' perceived abilities to evaluate the credibility of information they receive online. Perceived credibility of health information found online is based both on source trustworthiness and content accuracy, and there is a positive relationship between ease of access to and comprehension of health information found with perceived trust in that information (Paige, Krieger, & Stelfox, 2016). Thus, parents with more COVID-19 perceived knowledge may in turn be more confident in their abilities to discern credible information. This gap would contribute to a disparity in and challenge to public health communication that is important to address, especially as it relates to safeguarding dependent or vulnerable others. Based on the literature on the relationships between information-seeking, ability to evaluate credibility, and self-efficacy, and the following hypotheses are drawn:

H4: Individuals with perceived high knowledge levels seek COVID-19 information more actively than those with low levels.

H5: Parents who perceived themselves as more knowledgeable about COVID-19 will demonstrate higher levels of perceived ability to evaluate credibility of online information.

Method

Data collection

In order to test the hypotheses, data were collected from a sample of U.S. adults via Amazon's Mechanical Turk (MTurk) ($N = 719$) on March 20, 2020, as uncertainty and speculation about COVID-19 were rapidly mounting (Shannon, 2020). First, participants were filtered by MTurk: only U.S. residents/citizens whose native language is English were included. Next, participants were asked whether they had any children living at home. Since the focus of the study is protective efficacy (i.e., one's belief about his/her ability to protect his/her child/children during a crisis), individuals without a child ($n = 219$) were dropped, leaving a final sample of 500. To boost data quality and ensure participants were accurately reporting having a child age 18 and under living at home, the researchers paid for the extra qualification with the MTurk panel. Also, as a further measure to prevent validity from being compromised by people taking the survey who did not have children, there were screening questions at the beginning that directed people who did not meet the qualifications out of the survey.

Participants were directed to think about the oldest child living in their homes who was under the age of 18 when completing the survey, given that perceptions could vary by child and age. Crisis self-efficacy (Park & Avery, 2019) was measured, followed by perceived knowledge about COVID-19, protective self-efficacy, information channel reliance, perceived credibility of information found on the Internet, and demographic information. Finally, the participants were thanked, and 1.25 USD was given to each participant via Amazon as compensation for their time.

Measures

Crisis self-efficacy and protective self-efficacy

Twelve items were used to assess crisis self-efficacy (Cronbach's $\alpha = .93$, $M = 4.09$, $SD = .64$) (Park & Avery, 2019: "I am certain that I can take necessary action to protect myself during a crisis"; "I know that I have the ability to protect myself in case of a crisis"; "I am able to use resources effectively during a crisis"; "What I do with the knowledge I have about a crisis will keep me safe"; "I can help others decide what actions to take during a crisis"; "During a crisis, I can stick to my goals"; "During a crisis, I can accomplish my goals"; "During a crisis, I can achieve most of the goals I have set for myself"; "I am confident that I can deal efficiently with unexpected crisis situations"; "Thanks to my resourcefulness, I know how to handle unforeseen situations during a crisis"; and "During a crisis, I can handle whatever comes my way." To measure protective efficacy by minimally adapting the crisis self-efficacy scale (Cronbach's $\alpha = .95$, $M = 4.13$, $SD = .68$), the wording of those items was slightly revised to shift referent from self to other; for example, the first item was "I am certain that I can take necessary action to prevent this threat for my child" while the last item was "I can usually handle whatever comes my way in preventing this threat for my child." In most cases, to closely adapt the scale, "for myself" became "for my child," or that clause was added to an original item. Parents were directed to think about COVID-19 as they replied to each item.

Perceived knowledge about COVID19

Three questions were asked to evaluate participants' evaluations of their COVID-19 perceived knowledge level: "In general, I am knowledgeable about COVID-19"; "I know a lot about COVID-19"; "I have a good understanding of the risks that COVID-19 poses" (Cronbach's $\alpha = .86$, $M = 3.94$, $SD = .69$).

Information channel reliance

On a 5-point scale (1 = *Never*, 2 = *Sometimes*, 3 = *About half the time*, 4 = *Most of the time*, and 5 = *Always*), participants were asked to indicate their reliance on channels for health information for their children (e.g., "When you want to find health information for your child on a health threat, to what extent do you use the following sources?"). There were eleven channels listed: TV news, Newspapers, Magazines, Pediatrician/Physician, Friends, Family, Pharmacist, Website, Facebook, Twitter, and Instagram.

Evaluations of credibility of information obtained on the internet

Based on Paige et al.'s (2019) scale, to measure participants' perceived abilities to assess the credibility of the health information they find on the Internet, three questions were asked: "I can tell when the source of information I find on the Internet is a credible source of health information"; "I can tell when health information on the Internet is not trustworthy" (reverse-coded); "I know how to evaluate the credibility of Internet users who share health information" (Cronbach's $\alpha = .88$, $M = 4.11$, $SD = .70$).

Results

Sample profile

The final sample ($n = 500$) represented diverse and representative demographic backgrounds (see Table 1). Ages of respondents ranged from 20 to 66 years old, with the average age of 39.7 ($SD = 8.56$), and the majority of participants were Caucasian ($n = 483$, 87.6%), followed by African-American ($n = 35$, 7.0%), Asian ($n = 12$, 2.4%), multi-racial ($n = 8$, 1.6%), other ($n = 3$, .6%), and American Indian or Alaska Native ($n = 2$, .4%).

Hypotheses tests

H1 explored the relationship between crisis self-efficacy and protective efficacy. The linear regression result indicated there is a positive relationship between the two variables ($\beta = .35$, $p < .001$); thus, H1 was supported. Next, for H2, another linear regression test was performed to examine the relationship between perceived knowledge about COVID-19 and protective efficacy. Supporting H2, the two variables were positively related ($\beta = .37$, $p < .001$).

H3 predicted that the relationship between crisis self-efficacy and protective efficacy would be mediated by participants' perceived COVID-19 knowledge. To test H3, a mediation test using Hayes's (2012) PROCESS macro was performed. First, crisis self-

Table 1. Demographic Information of Survey Participants.

Variables	Class	n	%
Gender	Male	187	37.4
	Female	312	62.4
	Other	1	0.2
Age	18–29 years	45	9.0
	30–49 years	388	77.6
	Over 50 years	67	13.4
Race and Ethnicity	Caucasian	438	87.6
	African-American	35	7.0
	Asian	12	2.4
	Multi-racial	8	1.6
	American Indian or Alaska Native	2	0.4
Education	Other/decline to respond	5	1.0
	A high school degree or less	48	9.6
	Some college but no degree	81	16.2
	An associate's degree	66	13.2
Income	A bachelor's degree	217	43.4
	Master's, doctoral, or professional degree	88	17.6
	Less than \$30,000	57	11.4
	\$30,000 – \$39,999	50	10.0
	\$40,000 – \$49,999	40	8.0
	\$50,000 – \$59,999	57	11.4
	\$60,000 – \$69,999	45	9.0
	\$70,000 – \$79,999	50	10.0
	\$80,000 – \$89,999	46	9.2
	\$90,000 – \$99,999	44	8.8
Child(ren)	\$100,000 – \$149,999	78	15.6
	\$150,000 or more	33	6.6
	One	192	38.4
	Two	183	36.6
	Three or more	125	25.0

efficacy was significantly associated with both perceived knowledge about COVID-19 and protective efficacy. When both crisis self-efficacy and perceived knowledge about COVID-19 were included in the model, the associations of COVID-19 perceived knowledge with crisis self-efficacy and protective efficacy were significant, but the association of crisis self-efficacy with protective efficacy was not. Specifically, as shown in Figure 1, the β coefficient between crisis self-efficacy and protective efficacy decreased from .35 ($p < .001$) to .17 ($p = ns$). In addition, the result for indirect effect analysis was significant (effect = .55; SE = .18; CI = .23 to .95), confirming the mediating role of COVID-19 perceived knowledge. Thus, H3 was supported.

H4 explored the relationship between perceived COVID-19 knowledge and reliance of various channels for health information. The sample was dichotomized into two groups (i.e., high and low-knowledge groups) for the analysis. The mean score of perceived knowledge about COVID19 was 3.94 ($SD = .69$). The mean score of the high-knowledge group ($n = 306$) was 4.36 ($SD = .38$), while of the low-knowledge group ($n = 194$) was 3.27 ($SD = .53$). With regard to the participants' reliance on each information channel, TV news ($M = 3.09$, $SD = 1.37$) was the most frequently used information source followed by Pediatrician/Physician ($M = 2.57$, $SD = 1.38$), Family ($M = 2.54$, $SD = 1.19$), Websites ($M = 2.53$, $SD = 1.62$), and Friends ($M = 2.26$, $SD = 1.12$). Among social media, Facebook use ($M = 2.23$, $SD = 1.36$) was the highest followed by Twitter ($M = 1.85$, $SD = 1.23$) and Instagram ($M = 1.58$, $SD = 1.14$). As shown in Table 2, for all information channels, the high-knowledge group's scores were higher than the low-knowledge group's scores; thus, H4 was supported.

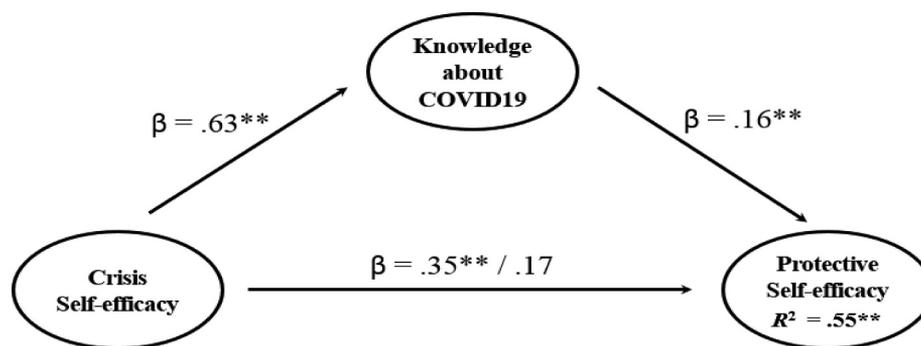


Figure 1. Standardized parameter estimates of the mediation analysis. ** $p < .001$.

Table 2. Information Channel Use by Knowledge about COVID19.

	TV news	Newspaper	Magazine	Pediatrician/Physician	Friends	Family	Pharmacist	Website	Facebook	Twitter	Instagram
Total	3.09	2.08	1.48	2.57	2.36	2.54	1.84	2.53	2.23	1.85	1.58
<i>M</i> (<i>SD</i>)	(1.37)	(1.30)	(1.00)	(1.38)	(1.12)	(1.19)	(1.22)	(1.62)	(1.36)	(1.23)	(1.14)
H-Know	3.20	2.13	1.63	2.70	2.47	2.67	2.06	2.65	2.35	1.94	1.76
<i>M</i> (<i>SD</i>)	(1.28)	(1.25)	(1.09)	(1.28)	(1.14)	(1.17)	(1.26)	(1.58)	(1.31)	(1.22)	(1.22)
L-Know	2.85	1.80	1.30	2.35	2.20	2.34	1.65	2.24	2.10	1.61	1.40
<i>M</i> (<i>SD</i>)	(1.38)	(1.15)	(.75)	(1.35)	(1.03)	(2.67)	(1.09)	(1.55)	(1.34)	(1.13)	(.97)

To test H5, that COVID-19 perceived knowledge positively influences the perceived ability to evaluate the credibility of Internet health information, an ANOVA was conducted. The analysis revealed that the high-knowledge group's score ($M = 4.32$, $SD = .65$) was significantly higher than the low-knowledge group's score ($M = 3.87$, $SD = .70$), $F(1,498) = 54.70$, $p < .001$. Therefore, H5 was supported.

Discussion

As one of the most powerful predictors of behavior (Rimal & Adkins, 2003), self-efficacy (Bandura, 1997) has demonstrated broad utility in health communication models and research in predicting a range of health behaviors (Bartle & Harvey, 2017; Lee & Park, 2016; Loton & Waters, 2017; Thrasher et al., 2016; Travaglini et al., 2017). This study extends that work into a new domain and proposes the construct of protective efficacy, which shifts the behavioral focus from the self to a dependent other. Protective efficacy is conceptualized as the perceived ability to complete a task to keep another safe during a crisis situation. In this case, parents' perceived abilities to keep their children safe by performing safeguarding behaviors during COVID-19 are explored along with the role of information-seeking in that process, which addresses So et al.'s (2019) contention that the role of information-seeking in risk message processing needs investigation.

Crisis self-efficacy and protective efficacy

Park and Avery (2019) developed and validated a more context-specific crisis self-efficacy scale that predicted perceptions of Zika preparedness (Avery, Kim, & Park, 2020). This study used a closely adapted version of that scale, changing the referent from self to the child, and, in testing hypothesis 1,

revealed a positive relationship between crisis self-efficacy and protective efficacy. Given that self-efficacy can be a generalized trait that reflects one's ability to cope as a personal resource (Schwarzer & Fuchs, 1996), it follows that those who are more efficacious would also be more confident in their abilities to protect others. Even in the face of diminished control that accompanies keeping children safe by enforcing their safeguarding behaviors during the coronavirus pandemic, parents with stronger personal coping resources were more confident in their abilities to safeguard children. Although this study cannot demonstrate causation, the link between self-efficacy and protective efficacy has promise in informing interventions to motivate parental engagement with safeguarding behaviors of children.

Self-efficacy is generally agreed to be modifiable. A meta-analysis of previous studies on self-efficacy and health behaviors (Strecher et al., 1986) revealed self-efficacy can be increased or decreased over time, and these enhanced or diminished self-efficacy levels influence a broad range of health behaviors. Frisby et al. (2013) note that crisis response differs from ongoing health issues in that intervention campaigns for latter have the luxury of time to develop, test, and refine strategy. They note "by tailoring messages to increase self-efficacy by rounding the learning cycle, crisis managers can quickly and effectively help at-risk publics enact strategies to protect themselves" (p. 267). COVID-19 presented unprecedented challenges to that end to the public health community with its rapid spread and the myriad unknowns surrounding the viral strain.

So, the applied value in this research lies in that, even in the face of unknowns such as COVID-19, parents' protective efficacy levels can and should be strategically targeted *before* and during health crises. Future research should test different message strategy to that end. Further, if parents' self-efficacy is boosted, their protective efficacy *may* in turn be boosted.

Again, since a causal link cannot be established here, that relationship should be parceled out in future research. However, these results offer early evidence that protective efficacy has strong heuristic potential for informing and extending health communication models and theory. Specifically, protective efficacy may expand the explanatory power for health behavioral models that include self-efficacy. Given that self-efficacy is a strong power predictor of personal behaviors (Rimal & Adkins, 2003), protective efficacy's incorporation may enable scholars to extend that understanding further to protecting others. This stream of research would yield valuable data to inform interventions for those responsible for protecting a vulnerable other such as dependent children or elderly parents for whom one cares during health crisis as well as increase health behavioral models' explained variance in adherence to safeguarding directives.

One caveat is that there is evidence of somewhat of a diminishing return regarding self-efficacy that may be particularly salient to the concept of protective efficacy. Self-efficacy and optimism are theoretically unique but related constructs. A future extension of this research on protective efficacy could explore the moderating effects of "defensive optimism" and "functional optimism," which Schwarzer and Fuchs (1996) note are the general belief that actions will result in positive outcomes and the belief in ability to cope with life's demands, respectively.

Functional optimism relies on positive outcome expectations and, to a greater extent, personal coping resources such as self-efficacy. However, people may overestimate their resources and underestimate risk. Perceived self and protective efficacy must be high enough to generate motivation and confidence but not unrealistic. Asymptomatic spread and others' noncompliance with safeguarding protocol during COVID-19 underscore how parents with even the strongest levels of protective efficacy must also be aware of the risks imposed on children that are beyond their control (i.e., personal confidence that a child may be compliant with social distancing and mask use and therefore safe in crowds where others aren't).

So, the challenge for public health interventions becomes how to bolster crisis self-efficacy and protective efficacy but preserve realistic assessments of the risks that exceed the boundaries of personal or protective control. The vast amounts of often conflicting information parents considered when deciding on schooling formats for their children during COVID-19 may compromise protective efficacy. Even the American of Pediatrics recommended a safe return to school then clarified the statement that the decision should be based on local health assessments (Jenco, 2020).

Perceived knowledge as protective power

Amidst changing protocol and conflicting recommendations, parents' general evaluations of their COVID-19 knowledge levels are important. The more informed parents perceived themselves to be about COVID-19, the higher were their levels of protective efficacy (H2 was supported). In fact, parents' perceived knowledge levels, measured as how informed they felt about COVID-19 and understood its risks, mediated the

relationship between crisis self-efficacy and protective efficacy (H3 was supported). The mediating role of perceived knowledge on the relationship between crisis self- and protective efficacy is compelling; protective efficacy is clearly more than simply a reflection of self-efficacy. People who evaluated themselves as less knowledgeable about COVID-19 had lower levels of protective efficacy, which illustrates the importance, and challenge, of getting *accurate* information to parents. Perhaps with perceived knowledge comes a confidence that manifests in evaluations of more ability to manage the situation and to protect others. As An (2007) notes, the role of perception on behavioral intent is prominent in health behavior theory, and higher perceived knowledge levels may give individuals the confidence to try new alternatives or behaviors.

Frisby et al. (2014) revealed a decrease in self-efficacy among people who saw campaign messages that lacked instructional information, perhaps because the absence of directives created perceived helplessness in averting risk. Frisby et al.'s (2014) study, taken together with these results, illustrate the important influence of perceived knowledge on protective efficacy. With individual evaluations of knowledge came power, it seems, in individual assessments of self- and protective efficacy. However, information-seeking and evaluations of the credibility of information are important next considerations.

Information-seeking and scrutiny

Results of this study supported H4; individuals with higher perceived knowledge levels seek COVID-19 information more actively than those with low levels. This study again answers So et al.'s (2019) call for research on the role of information-seeking in risk message processing regarding the scrutiny applied to the information gleaned. As revealed above, perceived knowledge exerts broad influence on protective efficacy, so the ability to assess the credibility of that information is a pressing next consideration, particularly given the abundance of coronavirus misinformation (Islam et al., 2020). Paige et al. (2017) reveal a positive relationship between access to and comprehension of health information with trust in that information, so it follows that those who are more knowledgeable are also more cautious information consumers.

Parents who felt more knowledgeable about COVID-19 were more active information-seekers and as well as more confident in their abilities to evaluate the credibility of that information (H5 was supported). In fact, high-knowledge parents used every channel in this study significantly more for coronavirus information more than low-knowledge parents. This disparity contributes to a troublesome knowledge gap in breadth *and* accuracy, resulting not only in more but also better-quality information among the parents who, in turn, had higher levels of protective efficacy. Interestingly, when asked to what extent they use the following sources for COVID-19 information, participants ranked television news, pediatricians/physicians, family, websites, and friends in that order. Facebook, Twitter, and, finally, Instagram were the least used. This was an encouraging result given the "pandemic of misinformation" surrounding COVID-19, as social media are largely responsible for the proliferation of false information (Worrall, 2020).

Park et al. (2019) found that people with low-perceived Zika risk relied more on medical professionals and friends and family for information, but those who felt more vulnerable to Zika reported using real-time information channels such as television news and Facebook for information. Future research should consider the effects of perceived risk on protective efficacy. These data echo Park, Boatwright, & Avery (2019) finding that amidst disease outbreak, television, medical professionals, and family are important information sources, and this study offers those as important campaign intervention points.

Limitations

There are limitations to these findings. The samples skew toward women. This may reflect that women were more likely to answer questions regarding their children and may in fact support data quality, if men who were unable to confidently answer questions about caring for their children during COVID-19 declined participation. Also, perceived knowledge levels could represent an optimistic bias; the measure of interest here was more a general self-evaluation of how much participants believed they knew about COVID-19 than specific knowledge indicators regarding the nature of the virus. Future research should test the extent to which self-assessments reflect reality with COVID-19 knowledge scales. However, even the perception of being informed is important to the extent that it makes parents feel more control in safeguarding children. A more daunting interpretation, though, is that they are acting on false information. However, the relationship between perceived knowledge levels and ability to evaluate the credibility of information found online ameliorates that concern somewhat. Finally, it is interesting that overall scores for channel use for COVID-19 information are low. Perhaps people are relying on multiple channels for information, so dependence on a particular channel is not high.

Conclusion

This research presents the novel construct of protective efficacy and reveals some early, yet important, considerations in its assessment and many directions for future research. Coronavirus threatened both parents' abilities to protect themselves and their children. Self-efficacy has been an important construct in health communication for decades; protective efficacy holds similar promise. The relationship between self- and protective efficacy was mediated by how informed parents felt about COVID-19. Parents who were more confident in their abilities to protect children during the pandemic also used information channels more and showed more competence in ability to discern credibility of information they found online. Television news, medical professionals, and family members emerge as important campaign intervention points. Overall, the novel construct of protective efficacy, even in this exploratory research, may provide rich value in health communication theory and practice. It is hard to imagine a more challenging time for parents trying to keep their children safe or a more opportune time for scholars to identify variables affecting that process than during the COVID-19 pandemic.

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