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Consuming Memes During the COVID Pandemic: Effects of Memes and Meme Type on COVID-Related Stress and Coping Efficacy

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As COVID-19 quickly spread across the globe, social media memes (i.e., typically humorous or cute images related to popular culture) about life in a pandemic also spread across the Internet. We conducted a between-subjects online experiment (N = 748) to assess how viewing memes during this pandemic era may influence audiences' stress and coping. In terms of psychological responses, we found that meme viewing (vs. nonmeme content) was associated with stronger cuteness responses, higher levels of reported humor, more positive emotions, and lower levels of information processing. However, meme viewing was not associated with state anxiety, COVID-19-related stress, or COVID-19-related coping efficacy. Furthermore, because memes generated positive emotions that were in turn related to increased COVID-19 coping efficacy, a path analysis found that viewing memes, as compared with nonmeme content, indirectly increased COVID-19 coping efficacy. Looking at the effects of meme type, we found that memes featuring animals were rated as cuter than memes with humans, though the former engendered lower information processing and predicted lower coping efficacy than did human memes. Cuteness responses, generally, were associated with decreased coping efficacy. In contrast, meme captions related to COVID-19 were related to deeper information processing and lower levels of COVID-19-related stress than were captions unrelated to COVID-19. Information processing was, in turn, associated with increased coping efficacy. This research demonstrates that memes, particularly those that relate to a highly stressful context, may help support efforts to cope with the stressor.

Public Policy Relevance Statement

Compared with viewing other media content, viewing memes resulted in Internet users experiencing greater humor and positive emotions. When Internet users viewed memes with captions focused on COVID-19, they reported lower COVID-19-related stress levels than if they viewed memes focused on other topics, suggesting that tackling a stressor directly with humorous popular media content can benefit our emotional state and stress levels.

Keywords: COVID-19, memes, stress, coping, media effects

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With the onset of a global pandemic leading to hundreds of thousands of deaths, millions of infections, physical and social isolation, economic crashes, housing crises, shifts to virtual schooling, and more, 2020 and 2021 have been turbulent. As COVID-19 spread, so did concerns about the potentially negative impact of consuming too much COVID-related information on one's mental health (Cummins, 2020). Though news consumption is important for staying abreast of health threats, prevention efforts, and treatments (Myrick, 2014), many argue that the emotional risks of exposing oneself to too much COVID-related information during the pandemic may be high. The World Health Organization even recommended avoiding too much COVID-related news, instead urging people to explore nonnews media, such as music or books (Kopecki, 2020). Consistent with this recommendation, evidence shows that individuals under stress often turn to media as a way to cope (Nabi et al., 2017). Although this research has looked primarily at traditional mediums and genres (e.g., use of TV, movies, music), little work has examined the popular media format of the social media meme.

Indeed, as COVID-19 spread around the globe, memes about the virus began to populate social media feeds, adding a dose of humor or sarcasm about the new realities of life during a pandemic, whereas others aimed to distract from COVID-19 altogether (Romano, 2020). By definition, Internet memes are "units of popular culture that are circulated, imitated, and transformed by individual Internet users, creating a shared cultural experience in the process" (Shifman, 2013, p. 367). Memes utilize humor to draw attention to contradictions or absurdities associated with a

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situation (Knobel & Lankshear, 2007; Miltner, 2014; Yus, 2018). Given the unprecedented shared experience of living through a global pandemic, it is unsurprising that Internet users turned to memes as a way to make meaning of their experiences and participate in the process of a cultural construction of pandemic life.

The quick and rampant generation of meme content presented the possibility that this form of popular media could potentially buffer against the deleterious emotional side effects of consuming COVID-related information and help individuals to cope with it. Coping efficacy is an important component of dealing with stress, in that stress is not just about the stressor itself but about how well-equipped people believe they are to deal with that stressor (Cohen et al., 1983). With these conceptual considerations in mind, the question remains: Do social media memes offer benefits akin to more traditional forms of media in terms of boosting positive affect, reducing stress, and aiding coping in the era of COVID-19?

There is a growing literature suggesting that media consumption has great potential to alleviate stress. Some research has drawn the link between media use and recovery from work-related stress, with hedonic media experiences argued to relate to relaxation and psychological detachment, and eudaimonic media related to mastery experiences and control (Rieger et al., 2014). However, coping needs are arguably different from hedonic and eudaimonic needs, in that coping is focused on improved emotional outcomes resulting from meeting the demands or challenges posed by threats in one's environment rather than just feeling good or connected to others (Nabi et al., 2017). Evidence that audiences frequently turn to media to cope with stressful life events exists (Nabi et al., 2017). However, the role of memes in meeting these important coping needs remains unaddressed, despite anecdotal evidence that media users both seek them out and find them comforting (Al-Heeti, 2020). As such, we ask an initial question regarding the ability of memes to shape audience psychological states and stress:

> *Research Question 1:* Will viewing memes affect audiences' affective, cognitive, and stress-related outcomes compared with not viewing memes?

Of course, not all memes are the same. One common theme in memes is the inclusion of notably cute content, such as babies or puppies. Cuteness responses are associated with positive emotions as well as increased attention to complex information (Kogan et al., 2018; Nittono et al., 2012). Typically, younger creatures, such as babies and young animals, are perceived as cuter than older ones, which is presumably a survival mechanism, given young creatures cannot fend for themselves (Nittono et al., 2012). The positive emotional boost experienced from viewing memes with younger creatures that are presumably seen as cute may help social media users to cope with the stress of a pandemic (Folkman & Moskowitz, 2000; Prestin & Nabi, 2020):

> *Research Question 2:* Does the cuteness of the meme image influence (a) positive emotions, (b) state anxiety, (c) information processing depth, (d) COVID-related coping efficacy, or (e) COVID-related stress?

A second practical difference in memes relates to what type of creature they feature: humans or animals. Social media content about animals is popular and associated with users' experiencing positive emotions (Myrick, 2015). However, media effects literature has yet to test if individuals have different psychological responses to human versus animal-focused memes:

> *Research Question 3:* Does the type of meme (animal or human) influence (a) positive emotions, (b) state anxiety, (c) information processing depth, (d) COVID-related coping efficacy, or (e) COVID-related stress?

Finally, a third key difference in memes during 2020 and 2021 was whether the memes focused on the COVID-19 pandemic or not. One way people cope with stressful situations is by seeking out distractions (Carver et al., 1989), such as memes. However, it is unclear which might serve people's coping needs better: COVID-19-related memes that may help diffuse negative affect around the stressor or COVID-19-unrelated memes that may help to distract and uplift. Thus, we ask the following question:

> *Research Question 4:* Does the relevance of the meme caption to the stressful context (COVID-related or not) influence (a) positive emotions, (b) state anxiety, (c) information processing depth, (d) COVID-related coping efficacy, or (e) COVID-related stress? (Figure 1)

Method

This study is a between-subjects online experiment: 2 (Meme Image Cuteness Manipulation: Young vs. Old Creature) × 2 (Meme Image Creature Manipulation: Animal vs. Human) × 2 (Meme Caption Topic: Related vs. Unrelated to COVID) plus three control conditions.

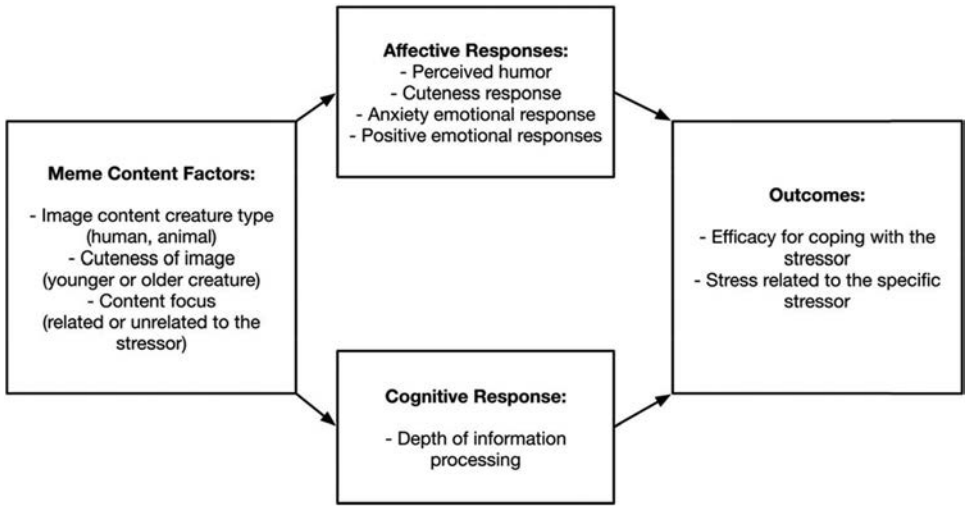
Participants

Participants were recruited from Amazon's Mechanical Turk via CloudResearch. A total of 799 individuals started the questionnaire. In all, 16 were removed for spending less than 3 min on the questionnaire; 16 people did not view the stimuli; and 19 skipped or wrote nonsensical responses in an open-ended prompt immediately after the stimuli asking them to briefly describe what they viewed (final $N = 748$). Of those participants, 54.7% identified as women, 44.4% as men, 0.9% as nonbinary or did not answer, 72.2% as White, 12% as Black/African American, 6.7% Latino(a)/Hispanic, 13.5% Asian, 0.9% Native American/American Indian, and 1.1% as other. For education level, 36.5% had at least a college degree. In addition, 5.5% reported having been diagnosed themselves with COVID-19, 9.1% reported that someone in their household had been diagnosed with COVID-19, and another 52% reported someone close to them (but not living in their household) had been diagnosed. Age ($M = 41.82$ years) ranged from 18–88.

Procedures

After providing consent to participate, participants provided background demographic and stress information. Next, participants who were randomly assigned to the meme or plain text control conditions (described below) viewed three images—all from the same condition—sequentially. Participants randomly assigned to the no meme/no meme-related content control condition viewed one screenshot of a news headline about advances in car stereo systems. Participants only viewed images related to their randomly

Figure 1
Conceptual Model



assigned condition (either one of the eight treatment conditions or one of the three control conditions). After viewing all the stimuli for their respective condition, all participants provided their overall reactions to the set of messages to which they were exposed along with their COVID-related coping efficacy and stress. Additional dependent variables were also assessed after these variables and are reported elsewhere. Participants received $1. Data were collected in December, 2020.

Stimuli

A pretest was used to choose the meme content for this study out of an initial pool of 112 memes to ensure they were viewed as equally humorous across our manipulations. These pretested memes were found on popular meme websites such as "Imgur" and "Imgflip." Most memes were unaltered from their original online sources. However, to create comparable COVID versus non-COVID captions, some captions were written by the authors and reviewed by a nonauthor who frequently creates meme content on social media. For the cuteness manipulation, young creatures included human babies or toddlers and baby animals (e.g., kittens, puppies), whereas older creatures were clearly adult humans or animals. The pretest also ensured that individuals viewed the younger creatures as cuter than the older ones. The three control conditions were designed to be neither funny nor sarcastic, as memes typically are. These three controls were (a) no meme content exposure, (b) meme-related COVID content without images (i.e., plain text describing the underlying meaning of a COVID-related meme), and (c) meme-related non-COVID content without images (i.e., plain text describing the underlying meaning of a non-COVID meme). See Table 1 for a detailed description of the stimuli used in this study.

Measures

Preexisting stress level was measured with five items adapted from the study by Cohen et al. (1983; $\alpha = .93$, $M = 3.46$, $SD = 1.74$), including "In the last month, how often have you felt nervous and stressed?" *Cuteness response* was measured with three items adapted from Steinnes et al. (2019) asking participants how cute, adorable, and sweet-looking the images were ($\alpha = .97$, $M = 4.09$, $SD = 2.16$). *Humor response* was measured with three items adapted from Nabi (2016) asking participants how funny, amusing, and humorous the images were ($\alpha = .97$, $M = 4.56$, $SD = 2.02$). *Anxiety* was measured with three items asking participants how tense, anxious, and stressed they felt ($\alpha = .93$, $M = 2.46$, $SD = 1.59$). *Positive emotions* were measured with six items: calm, relaxed, content, amused, delighted, cheerful ($\alpha = .91$, $M = 4.476$, $SD = 1.52$). *Information processing* was measured with five items adapted from Oeldorf-Hirsch and DeVoss (2020; $\alpha = .90$, $M = 3.95$, $SD = 1.63$), including "I thought about how what I viewed related to other things I know." *Coping efficacy* for COVID-19 was measured with three items adapted from Cohen et al. (1983; $\alpha = .95$, $M = 5.03$, $SD = 1.42$), including "I am confident in my ability to cope with the COVID-19 pandemic." *COVID-related stress* was measured with three items asking how nervous, stressed, and anxious participants felt about COVID-19 ($\alpha = .94$, $M = 4.25$, $SD = 1.73$). *Liking of animals* (potential covariate) was measured by asking participants to rate how much they liked dogs, cats, cows, and rabbits (each of these appeared at least once in the animal conditions). Together, these items formed a reliable index ($\alpha = .75$, $M = 5.13$, $SD = 1.33$). Finally, *previous experience* with COVID-19 (another covariate) was measured by combining three yes (1) versus no (0) questions into an additive index: (a) Have you been diagnosed with COVID-19; (b) Has someone in your household been diagnosed with COVID-19; and (c) Has someone close to you (but who does not live in your household) been diagnosed with COVID-19 (range: 0 – 3, $M = .67$, $SD = .72$).

Results

To address Research Question 1, which asked if memes, compared with nonmeme content, differently affect viewers, we ran a multivariate analysis of covariance with the conditions consolidated into two

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Table 1
Stimuli Description

Condition	Image description (meme conditions only)	COVID meme caption	Non-COVID meme caption	COVID plain text	Non-COVID plain text
Older animal 1	Small stoic dog wearing a turtleneck shirt and glasses	Me when I call it COVID-19 instead of the Rona	Me when I call it Tar-jay instead of Target	Rona is a nickname some people use for COVID-19	Sometimes people say plain words in a fancy way to feel fancy
Older animal 2	Close up of small cat staring menacingly	New study confirms cats can't spread COVID-19 but would if given option	New study confirms: Cats can't sabotage your car but would if given option	Very few cats get COVID-19, and even if they did, there is a very low chance they could spread it to humans	Cats are often thought to be less attached to their humans than are some other types of pets
Older animal 3	Cow staring into an apartment through the window	Party until the cows come home unless there's a stay-at-home order. Then don't party, or the cows might come to your home	Your chances of getting killed by a cow are low but never zero	Everybody needs to avoid social gatherings to prevent the spread of COVID-19	Statistics demonstrate that your chances of getting killed by farm animals is extremely low
Younger animal 1	Two kittens laying diagonally from each other on a couch, avoiding each other	When you've spent too much quarantine time together	When you both mad at each other & waiting for one to apologize first.	During COVID-19, people are spending a lot more time at home with their immediate family than they normally would	When in a fight with a friend or partner, it is often difficult to be the first person to apologize
Younger animal 2	Side profile of a small rabbit with arms apart	When you can only give air hugs during COVID	I saw a carrot. this big, no lie	Typical social greetings such as hugs and handshakes are discouraged during COVID-19	It is commonly thought that rabbits like to eat carrots
Younger animal 3	Small puppy with half its body hanging from the top of a crate looking bored	When ur stuck at home during the pandemic but really want to go out and play with ur frens	Hey can somebody give me a paw here?	During the COVID-19 pandemic, people miss hanging out with their friends	Sometimes we all need help to get out of tough situations
Older human 1	Man holding a gun with subtitle "Leave it on the doorstep and get the hell outta here."	Ordering pizza during a pandemic	When your mom says she found your junior high diary	Takeout and delivery food are staples of COVID-era dining	It is sometimes hard to, as an adult, look back at what we wrote when we were younger
Older human 2	Man (with "F" superimposed) looking at a woman in a dress (with "ood" superimposed), while holding the hand of a woman looking appalled (with "itness" superimposed)	Me in quarantine.	(no caption; all text is superimposed in the image)	During the COVID-19 pandemic, a lot of people have eaten more calories than they have burned off with exercise	It is often more tempting to eat than to exercise
Older human 3	Tom Holland in a plane, with head turned, looking concerned	Me after hearing someone cough on my $8 round trip flight to Italy	Me when your emotional support animal is more nervous than you		Most airlines allow emotional support animals on planes with the proper documentation

(*table continues*)

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Table 1 (*continued*)

Condition	Image description (meme conditions only)	COVID meme caption	Non-COVID meme caption	COVID plain text	Non-COVID plain text
Younger human 1	Toddler in a white and green t-shirt with clenched fist looking satisfied	Stay home saved lives	Draws a picture of a spaceship gets it on the fridge	Staying at home and only leaving the house whenever absolutely necessary can help prevent the spread of COVID-19 and save lives	Parents often put their children's art on the refrigerator
Younger human 2	Toddler in an infant car seat, buckled up with toys on their side, looking unimpressed	When you realize work from home ain't so fun anymore	When you realize this girl just stole your cup	After many months of working from home during the COVID-19 pandemic, the experience has become much less novel for many employees	Siblings often take toys from each other
Younger human 3	Toddler in an infant car seat giving the side eye	Once your online teaching class is over, and you're expected to put it to use in real life!	When you meet your blind date	During the COVID-19 pandemic, some people have been concerned that students may not learn as much from online content	Blind dates can result in surprise or disappointment when someone sees their date for the first time

groups (memes vs. nonmemes); dependent variables of cuteness, humor, positive emotions, state anxiety, information processing depth, COVID-19 coping efficacy, and COVID-19-related stress; and with animal liking, COVID-19 experience, and preexisting stress as covariates. A significant multivariate effect emerged, $\Lambda = .52$, $F(7, 731) = 98.24$, $p < .001$, $\eta_p^2 = .49$. The separate univariate analysis of covariances (ANCOVAs) and pairwise comparisons with Bonferroni correction revealed significant differences for cuteness, humor, positive emotions, and information processing but not for state anxiety ($p = .24$), COVID-19-related coping efficacy ($p = .84$) or COVID-19-related stress ($p = .97$). Those who saw a meme reported stronger ($M = 4.76$, $SE = .08$) cuteness responses than those in a control condition ($M = 2.32$, $SE = .13$; $p < .001$), after controlling for animal liking, COVID experience, and preexisting stress. Meme viewers also reported higher levels of humor ($M = 5.35$ $SE = .07$) than those who did not ($M = 2.43$, $SE = .11$; $p < .001$) as well as more positive emotions ($M = 4.71$, $SE = .06$) than nonmeme viewers ($M = 3.85$, $SE = .10$; $p < .001$). Viewing a meme was also linked with less information processing ($M = 3.81$, $SE = .07$) than viewing a control ($M = 4.31$, $SE = .11$; $p < .001$).

To address Research Questions 2 to 4, asking if the type of meme (young or old creatures, animal or human, COVID-19-focused or not) would influence cuteness response, humor response, positive emotions, state anxiety, information processing depth, COVID-19-related coping efficacy, or COVID-19-related stress, we ran a multivariate analysis of covariance with only those participants who viewed memes ($n = 542$), with animal liking, COVID-19 experience, and preexisting stress as covariates.

A significant multivariate effect of the cuteness manipulation emerged, $\Lambda = .62$, $F(7, 525) = 45.22$, $p < .001$, $\eta_p^2 = .38$. The separate univariate ANCOVAs revealed a significant effect only on the cuteness response. A pairwise comparison with Bonferroni correction showed that young creatures ($M = 5.64$, $SE = .10$) were rated as cuter than older ones ($M = 3.88$, $SE = .10$, $p < .001$). There was also a significant multivariate effect of the type of the creature (human or animal), $\Lambda = .70$, $F(7, 525) = 32.36$, $p < .001$, $\eta_p^2 = .30$. Separate univariate ANCOVAs revealed differences of type of creature on cuteness response, information processing, and COVID-19 coping efficacy. Pairwise comparisons with Bonferroni correction showed that animals ($M = 5.50$, $SE = .10$) were viewed as cuter than humans ($M = 4.02$, $SE = .10$; $p < .001$). However, animals engendered less information processing ($M = 3.61$, $SE = .10$) than humans ($M = 4.02$, $SE = .10$ $p = .003$), and predicted lower coping efficacy levels ($M = 4.91$, $SE = .08$) than did humans ($M = 5.16$, $SE = .08$, $p = .028$).

Regarding caption topic relevance to COVID-19, a significant multivariate effect also emerged, $\Lambda = .70$, $F(7, 525) = 5.23$, $p < .001$, $\eta_p^2 = .07$. The separate univariate ANCOVAs revealed a significant effect of caption topic on information processing and COVID-19-related stress. A pairwise comparison with Bonferroni correction showed that captions about COVID-19 ($M = 4.08$, $SE = .10$) generated deeper information processing than did captions unrelated to COVID-19 ($M = 3.55$, $SE = .10$, $p < .001$). Further, captions about COVID-19 were associated with lower levels of COVID-19-related stress ($M = 4.12$, $SE = .09$) than were non-COVID-19-related captions ($M = 4.40$, $SE = .09$, $p = .024$).

There was also a significant multivariate interaction between the cuteness manipulation (young vs. old creatures) and type of creature (animal or human), $\Lambda = .96$, $F(7, 525) = 2.81$, $p = .007$, $\eta_p^2 = .04$. Examining the univariate tests and then the pairwise comparisons with

Bonferroni correction showed two significant comparisons. Memes featuring younger animals (e.g., kittens and puppies) were viewed as cuter (M = 6.24, SE = .13) than those featuring young humans (e.g., babies; M = 5.05, SE = .14, $p < .001$). Similarly, memes featuring adult animals (e.g., kittens, puppies; M = 4.75, SE = .13) were viewed as cuter than those with adult humans (M = 3.00, SE = .13, $p < .001$). The same comparisons were run with information processing, and one significant difference emerged: Participants processed memes about adult humans (M = 4.12, SE = .14) more deeply than memes about adult animals M = 3.40, SE = .14, $p < .001$).

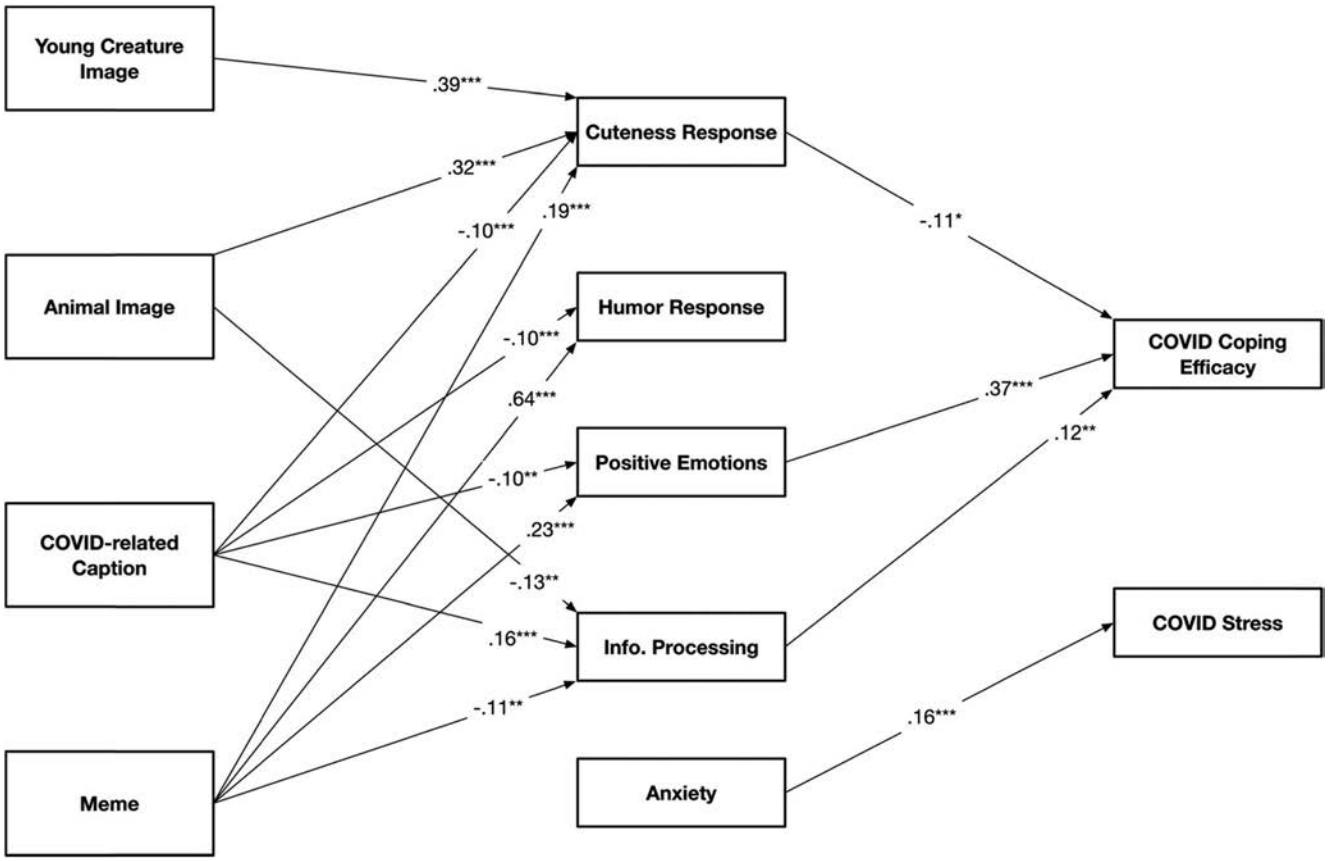
Finally, to assess the interrelationships between these variables, we ran a path analysis with the full sample in MPlus 8 Version 1.7. This allowed us to better understand the psychological mechanisms that might explain why meme type and topic influence COVID-related coping efficacy and stress (n = 745 after missing cases were deleted listwise). The exogenous variables in the model included four dummy coded variables to indicate cuteness manipulation with young coded as 1 and old as 0, creature image condition coded as animals 1 and humans 0, COVID-19 caption topic condition coded as 1 and non-COVID-19 captions coded as 0, and whether the message was any type of meme coded as 1 versus a control coded as 0, as well as preexisting stress level and COVID-19 experience. The mediators included the affective and cognitive responses to the message and COVID-19 coping efficacy and stress. In addition, mediators were allowed to covary with each other, and outcome variables were allowed to covary with each other, respectively. As a control variable, preexisting stress levels were allowed to predict the mediator variables and two outcome variables, whereas previous experience with COVID-19 (another control variable) was allowed to predict the outcome variables, too.

The model fit the data very well: χ^2 = 16.60, df = 13, p = .22; root mean square error of approximation = .02 (90% confidence interval [.000, .042], p-CLOSE = .99); comparative fit index = .999, standardized root mean squared residual = .016. See Figure 2 for all the significant paths in the model. Finally, 5,000 95% bias-corrected bootstrap samples were used to assess indirect effects between the message manipulations and outcome variables. Although there were some significant specific indirect effects (see Discussion), no indirect relationships had significant total indirect effects between an exogenous and outcome variable.

Discussion

Our goal was to assess whether memes generally, and different qualities of memes specifically, might differentially influence stress and coping-related outcomes. The reported findings

Figure 2
Path Model Results



Note. Only significant paths are shown. For the sake of parsimony, control variables are not shown.
* $p < .05$. ** $p < .001$. *** $p < .001$.

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indeed demonstrate that memes have the potential to influence our psychological states and, in some cases, our stress levels and ability to cope with stress. In addition, different meme features, including age of the featured creature, human or animal image use, and caption relevance to the stressor, can influence key outcomes of interest. Based on the group comparisons, our data demonstrated that people who viewed memes with captions focused on COVID-19 actually reported lower levels of COVID-19-related stress than did those who saw a non-COVID-19 caption. This finding is consistent with the idea that engaging memes can offer useful perspective, comfort, and validation for one's own experience, all of which can be psychologically beneficial. Our data also revealed different effects based on the type of meme featured. Animal images were rated as cuter than human images, and younger creatures were likewise rated as cuter than adult creatures. Notably, although cuteness has been previously related to many positive outcomes, in our study it was negatively related to coping efficacy. Practically, this suggests that if public health messengers want to use memes as a brief intervention to improve coping abilities, they may want to stick with memes of adult humans.

Besides state anxiety after message exposure, no other variable in the study was directly related to COVID-19-related stress. Viewing just three memes may not be enough to lower stress around the COVID-19 pandemic. Additional research is needed to understand how media use, more broadly, may help lower stress levels (Prestin & Nabi, 2020). Still, our results indicated that viewing memes generated higher levels of positive emotions, which were positively related to COVID-19 coping efficacy (in fact, the standardized indirect effect from meme viewing to positive emotions to coping efficacy was positive and significant, $B = .08$, $p < .001$). Memes have the potential to aid coping efforts via the positive emotions they evoke.

Further, our path analysis found that COVID-19-related captions resulted in greater information processing than non-COVID captions, and greater information processing was positively associated with coping efficacy, and this specific indirect effect was significant and positive ($B = .02$, $p = .012$). This finding suggests that social media content about stressful public events can encourage greater elaboration, which might encourage public health advocates to directly address the relevant health stressor with popular memes or other humorous content.

Given that the path analysis suggested that experiencing positive emotions and greater processing of message content are important psychological predictors of our ability to cope with the stress of COVID-19, it is reasonable to conclude that memes that generate such outcomes have the potential to aid coping. Notably, although humor is a defining characteristic of memes, humor responses to the memes in this study were unassociated with the outcomes of interest. This finding highlights that different positive emotions may have different effects on coping outcomes and thus should be a focus of future research.

In sum, this study provides initial evidence that memes may not be just frivolous fun; they are potentially helpful for coping with the stress of a global pandemic and connecting us psychologically while we remain physically apart. Memes could be used as very cheap, easily accessible potential interventions to support coping efforts.

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