Age Differences in Risk and Resilience Factors in COVID-19-Related Stress

Ann Pearman, Ph.D. & MacKenzie L. Hughes, B.A.

Georgia Institute of Technology

Emily L. Smith, Ph.D. & Shevaun D. Neupert, Ph.D.

North Carolina State University

Address correspondence to Ann Pearman, Ph.D., School of Psychology, Georgia Institute of Technology, 654 Cherry Street NW, Atlanta, GA 30322, USA. Email: apearman6@mail.gatech.edu. Phone: +1-404-385-1949.

Abstract

Objectives. Older adults are at higher risk for death and infirmity from COVID-19 than younger and middle-age adults. The current study examines COVID-19-specific anxiety and proactive coping as potential risk and resilience factors that may be differentially important for younger and older adults in understanding stress experienced due to the COVID-19 pandemic.

Method. Five hundred and fifteen adults aged 20-79 in the U.S. reported on their anxiety about developing COVID-19, proactive coping, and stress related to COVID-19 in an online survey.

Results. Although there were no age differences in stress levels, anxiety about developing COVID-19 was associated with more COVID-19 stress for older adults relative to younger adults, but proactive coping was associated with less COVID-19 stress for older adults relative to younger adults.

Discussion. Our results suggest that anxiety might function as a risk factor whereas proactive coping may function as a resilience factor for older adults' COVID-19 stress. We encourage future context-dependent investigations into mental health among older adults during this pandemic and beyond.

Keywords: coping, anxiety, pandemic, age differences

COVID-19 is a severe acute respiratory syndrome with common symptoms of fever, cough, and shortness of breath which has caused a worldwide pandemic. Currently, there is no known vaccine or antiviral treatment. The effects of COVID-19 on individuals as well as society have been profound. From intense quarantining and social distancing to job loss and financial disruption to loss of life, COVID-19 changed the way the world functions. As of June 7, 2020, the number of confirmed cases in the United States was 1,886,794 with 109,038 deaths (WHO, 2020). Older adults are at higher risk for developing complications due to COVID-19 (Nikolich-Zugich et al., 2020), and death and infirmity from COVID-19 is significantly higher in older than younger and middle-age adults (Remuzzi & Remuzzi, 2020; Wu & McGoogan, 2020). The current study examines COVID-19-specific anxiety and proactive coping as potential risk and resilience factors that may differentially impact younger and older adults in the experience of COVID-19 stress.

Given the higher risk profile of older adults, COVID-19 has the potential to cause more anticipatory anxiety for older than for younger adults. This anxiety may then translate into higher stress profiles which can have short- and long-term negative consequences on health and well-being. A study conducted in China showed moderate to severe levels of anxiety and stress due to COVID-19 (Wang et al., 2020). Qiu et al. (2020) showed that adults above the age of 60 in China had high levels of distress due to COVID-19.

Understanding possible resilience mechanisms for coping with the stress elicited by the pandemic is important (Chew et al., 2020; Polizzi et al., 2020), particularly for gerontologists (Steinman et al., 2020). Gaining deeper insight into processes that may prevent exposure to or reduce the effects of stressors can have tremendous benefits for longevity and successful aging (Neupert et al., 2019). Proactive coping is characterized by effortful steps to

modify or avoid a stressful event before its occurrence (Aspinwall & Taylor, 1997). The literature suggests that age is positively associated with proactive coping within the context of minor daily hassles (Neubauer et al., 2019), but it is not known how proactive coping may function within a chronic, ongoing stressor like the pandemic. Older adults have more cumulative life experience which could contribute to strategy development and use (Neubauer et al., 2019; Skinner & Zimmer-Gembeck, 2007). In many instances, older adults may be able to avoid experiencing stressors by using proactive coping prior to the stressor occurring. Within the context of the COVID-19 pandemic, individuals who are at higher risk for contracting the illness, particularly older adults, may take steps to protect against current and future stress related to this pandemic. It is important to understand risk and resilience factors that may influence individuals' feelings of stress during a crisis.

The strength and vulnerability integration model (SAVI; Charles, 2010) suggests that the experiences of life lived by older adults should help them to be better equipped to avoid everyday stressors than younger adults. Unlike many daily stressors (e.g., arguments), the COVID-19 situation reflects a continuous stressor with heightened uncertainty, which brings forward a very different set of daily challenges (e.g., actually avoiding a deadly virus with evolving recommendations). We know, however, that in many situations, older adults are more likely than younger adults to use proactive coping to manage their daily stress (Neubauer et al., 2019). Based on SAVI and the proactive coping literature, we predicted that older adults would engage in more proactive coping than younger adults.

The present study uses a U.S. national sample to examine anxiety about developing COVID-19 and proactive coping as potential risk and resilience factors that may differentially impact younger and older adults in stress experienced due to the COVID-19 pandemic.

Method

Participants

Through Amazon Mechanical Turk (MTurk; Buhrmester, Kwang, & Gosling, 2011), participants were recruited under the restrictions that they had to be native English speakers, at least 18 years old, and living in the U.S. Healthcare workers, those with a diagnosis of dementia, those who identified as gender variant, and those who scored zero points on the COVID-19 knowledge quiz were excluded. The final sample included 515 individuals who completed the survey between March 20 and April 19, 2020. The average age of respondents was 39.48 years (*SD* = 11.85, range = 20-79), 44% identified as women, and 9% were over the age of 60.

Procedure

MTurk was used to collect online survey data. After participants selected the study on MTurk, a link was provided to the Qualtrics survey. Individuals provided informed consent by electronically indicating that they agreed to and understood the study protocol. Starting on March 20, 2020, human intelligence tasks (HITS) were released approximately every three days to promote continued completion of the surveys over time. The survey took approximately 25 minutes to complete and participants were compensated $3.00. The study was approved by the Georgia Institute of Technology Institutional Review Board.

Measures

Data collection began several weeks before the National Institutes of Health released the COVID-19 survey repositories which were not disseminated until April 16, 2020 to standardize survey items related to COVID-19.[1,2]

Stress. Participants rated their level of COVID-19-related stress to the question "How stressed are you about the COVID-19 outbreak?" on a 1 (*not at all*) to 5 (*extremely*) scale. This question about COVID-related stress is similar to item #7 on the Coronavirus Impact Scale (https://disasterinfo.nlm.nih.gov/content/files/Coronavirus_Impact_Scale.pdf) and is designed to measure current stress derived from this pandemic.

COVID-19 Anxiety. Participants answered the question "How anxious are you about developing COVID-19?" on a 5-point scale ranging from 1 (*not at all anxious*) to 5 (*very anxious*).

Proactive Coping. The Proactive Coping scale (Aspinwall, Sechrist, & Jones, 2005) included six items rated on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). An example includes, "I prepare for adverse events." Scores were coded (or reverse coded) such that higher scores on the scale indicate more proactive coping (Cronbach's alpha = .73).

Covariates. The following covariates were included because of their potential to be associated with pandemic-related stress (Qiu et al., 2020; Wang et al., 2020): gender, education, self-rated health, COVID-19-related knowledge, and endorsed protective actions. Self-rated health was measured on a 5-point scale ranging from 1 (*poor*) to 5 (*excellent*). COVID-19-related knowledge[1] was measured with a 29-item quiz based on information obtained from the CDC and the WHO websites in late March 2020. Participants responded

(*agree/disagree/don't know*) to a series of questions about COVID-19. A list of 14 potential protective actions[2] was developed based on previous studies (Bish & Mishie, 2010) and CDC recommendations (CDC, 2020a). To measure endorsement of these protective behaviors, participants could respond (*yes/no*) to as many items from the list as were relevant.

Analysis

We report descriptive statistics and correlations between all study variables. In addition, we conducted a hierarchical multiple regression on COVID-19-related stress with covariates entered in the first step, main effects entered in the second step, and interactions entered in the third step. Only significant interactions are reported.

Results

Descriptive statistics and correlations among all study variables can be found in Table 1. Age had a moderately positive skew of 0.88 (*SE*=0.11). Significant age correlations included COVID-19 knowledge and proactive coping with older adults scoring better on the knowledge quiz as well as endorsing more proactive coping than younger adults. Additional correlations between precautions and age revealed that older adults were more likely to cover their mouth and nose when coughing and sneezing (r[505]=.11, p=.014), avoid small gatherings (r[510]=.09, p=.043), use disinfectant on surfaces (r[506]=.12, p=.006), but less likely to wear a mask (r[507]=-.10, p=.019) than younger adults. Other significant correlations were between proactive coping and both COVID-19 knowledge and precautions with higher proactive coping being related to more knowledge and endorsed precautions.

The multiple regression results with COVID-19-related stress as the dependent variable can be found in Table 2. In the first model, the significant covariates were health (lower health, higher stress), COVID-19 knowledge (lower knowledge, higher stress), and

COVID-19 precautions (more precautions, higher stress). The next model, which included the main effects, showed that both knowledge and precautions remained related to stress and that anxiety about developing COVID-19 contributed a large portion of the variance (β = .66) but health was no longer significant. The final model shows that there continued to be no effects of gender, education, self-rated health, age, or proactive coping. However, there were still large main effects with those who reported more anxiety about developing COVID-19, those with less knowledge about COVID-19, and those who took more precautions reporting more stress related to the outbreak. In addition, there were relatively small, but significant, Age by COVID-19 Anxiety and Age by Proactive Coping interactions. For the Age X COVID-19 Anxiety interaction, anxiety was associated with more COVID-19 stress for older adults relative to younger adults (Figure 1) as is seen by the steeper slope between low and high anxiety in the older adults compared to younger adults. Proactive coping, however, was associated with less COVID-19 stress for older adults relative to younger adults as is seen in the cross-over interaction (Figure 2).

Discussion

People around the world, including the U.S., have been extremely challenged by the COVID-19 pandemic. This pandemic, which is more dangerous for older adults, has the potential to cause tremendous stress. As gerontologists, it is critical to understand and help optimize the functioning of older adults during this time. This study is a preliminary exploration into the potential determinants of COVID-19 stress in a U.S. national cross-sectional sample of adults with a particular eye toward understanding the experience of older adults.

Our findings revealed no main effects of age on COVID-19-related stress. Instead, there was a significant interaction between both anxiety about developing COVID-19 and

proactive coping each with age in the COVID-19-related stress regression. These findings fit well with the SAVI model which suggests that older adults often develop strengths through a lifetime of experiences and are often better able to negotiate through challenges better than younger adults, but that in some circumstances if the challenges become too great, older adults may find themselves at risk for adverse effects (Charles & Luong, 2013). These findings underscore a fundamental insight of biological, behavioral, and social aging research (Kornadt & Rothermund, 2015; Wahl & Gerstorf, 2018) that the process of aging itself is highly diverse and context-dependent (Ayalon et al., 2020). The interactions between age and proactive coping and age and anxiety about developing COVID-19 highlight the notion that there is a diversity of experiences within older adults, and that not all older adults respond the same way to the same stressor.

Similar to previous work with minor daily hassles (Neubauer et al., 2019), older adults did report engaging in more proactive coping. We extend past work to evaluate the stress of the pandemic and show that proactive coping was particularly beneficial for older adults such that higher proactive coping was correlated with the lowest reports of COVID-19 stress. In addition, older adults did better on the COVID-19 knowledge quiz which suggests that older adults may more proactively seek out pandemic-related information from quality sources. Together, these findings suggest that efforts to boost proactive coping in older adults may help to deal with stressful events like pandemics. Previous work has shown promise in increasing proactive coping in older adults (Bode et al., 2006). Given the potential continuing and long-term impact of this pandemic, working toward support programs for older adults in terms of coping skills may be fruitful.

In line with past work (Wang et al., 2020), anxiety specific to developing COVID-19 was also related to higher COVID-19 stress in the entire sample. Additionally, this anxiety was worse for older adults (see Figure 2) in terms of stress responses. Combined with the

zero-order correlation between low COVID-19 knowledge and high COVID-19 stress, this interaction may be particularly important because it represents a potential avenue for intervention. Helping people, especially older adults, who have high anxiety about developing COVID-19 gain more knowledge about the pandemic in a non-threatening way may help lower the stress they experience during this time.

This study had several limitations. First, the study was cross-sectional; directionality cannot be determined and change in well-being and behavior over time cannot be assessed. Longitudinal designs could provide evidence for directionality of the relationships between COVID-related stress, anxiety, and proactive coping. Second, the sample was primarily white, highly educated, and skewed toward younger adults, a common pattern among those who complete surveys through online platforms such as MTurk. Third, the survey was administered to those living in the U.S. The negative consequences associated with this pandemic may vary across different regions and countries. Finally, the two COVID-related constructs were each composed of a single item rather than a series of questions. However, given the wide acceptance of other single item measures (e.g. self-rated health, subjective memory), we believe these are reasonable representations of the constructs of interest.

Understanding intraindividual variability in perceived stress and anxiety as well as changes in precautionary behaviors to avoid or prevent the spread of disease could also provide support for developing interventions aimed to reduce the negative psychological consequences of disease outbreak and increase adherence to health-promoting behaviors. Finally, lifespan samples that include adults from a wide age range, including those older than 80 years, should be examined to further understand potential age differences in the effects of COVID-19.

In conclusion, COVID-19-related stress shows important differences in risk and resilience for younger and older adults. Anxiety about developing COVID-19 was a stronger risk factor, but proactive coping was a stronger resilience factor for stress in older adults compared to younger adults. Efforts to boost proactive coping and reduce anxiety about developing COVID-19 may be especially helpful for older adults during this pandemic.

Acknowledgments

The authors have included parts of the study materials (COVID-19 Knowledge Quiz and COVID-19 Protective Behaviors Survey) in Supplemental Materials.

Informed consent did not allow for sharing of data.

The conducted research was not preregistered.

Funding

This work was supported by funds from the College of Science and the Office of the Executive Vice President for Research at Georgia Institute of Technology to Ann Pearman.

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Table 1

Descriptive statistics and correlations for all study variables (N = 515)

Variables	Mean	SD	1	2	3	4	5	6	7	8
1. COVID-19 Stress	3.01	1.17	-							
2. Gender	1.44	0.50	.08	-						
3. Education	15.32	2.88	.02	.01	-					
4. Health	3.73	0.96	-.11*	-.00	.11*	-				
5. COVID-19 Knowledge	19.91	4.68	-.13*	.05	-.01	-.13*	-			
6. COVID-19 Precautions	12.27	2.32	.23***	.10*	.09*	.07	.08	-		
7. COVID-19 Anxiety	3.08	1.46	.68***	.04	-.02	-.18***	.05	.17***	-	

8. Age	39.48	11.85	-.03	.10*	.00	-.14**	.11**	.04	-.01	-
9. Proactive Coping	4.06	0.63	-.03	.09*	.05	.18***	.37***	.15**	.03	.10*

Note. Scoring for gender is men (1) women (2).

*p<.05, **p<.01, ***p<.001.

Table 2

Summary of Hierarchical Multiple Regression Coefficients for COVID-19 Related Stress

Variable	Model 1						Model 2						Model 3					
	B	***SE B***	**β**	***t***	***p***	***F***	***B***	***SE B***	**β**	***t***	***p***	***F***	***B***	***SE B***	**β**	***t***	***p***	***F***
Intercept	2.75	0.46		6.00	<.01	11.01	2.91	0.37		7.92	<.01	64.34	2.94	0.37		8.06	<.01	53.05
Covariates																		
Self-Rated Health	-0.19	0.05	-.15	-3.54	<.01		-0.04	0.04	-.03	-0.98	.33		-0.03	0.04	-.03	-0.77	.44	
Gender	0.15	0.10	.06	1.51	.13		0.12	0.08	.05	1.58	.11		0.14	0.08	.06	1.82	.07	
Education	0.00	0.02	.01	0.16	.88		0.01	0.01	.02	0.59	.56		0.01	0.01	.01	0.38	.71	
COVID-19 Knowledge	-0.04	0.01	-.17	-3.86	<.01		-0.04	0.01	-.17	-4.87	<.01		-0.04	0.01	-.17	-4.91	<.01	
COVID-19 Precautions	0.12	0.02	.25	5.71	<.01		0.07	0.02	.13	4.03	<.01		0.06	0.02	.12	3.82	<.01	
Main Effects																		
COVID-19 Anxiety							0.53	0.03	.66	20.28	<.01		0.53	0.03	.66	20.47	<.01	
Age							0.00	0.00	-.03	-0.85	.39		0.00	0.00	-.03	-0.86	.39	
Proactive Coping							-0.01	0.07	-.01	-0.20	.84		-0.03	0.07	-.02	-0.44	.66	
Interaction Terms																		
Age x COVID-19 Anxiety													0.01	0.00	.07	2.31	.02	
Age x Proactive Coping													-0.01	0.01	-.07	-2.09	.04	
R^2						.10						.51						.52
ΔR^2						.10						.41						.01

Note. Age, COVID-19 Anxiety, and Proactive Coping were mean centered. Scoring for gender is men (1) women (2).

Footnotes

[1]Six of the eight items specifically focused on potential symptoms of COVID-19 are also listed on the Center for Economic and Social Research's Coronavirus Tracking Survey - Long Form (https://www.phenxtoolkit.org/toolkit_content/PDF/CESR_UAS.pdf). The full scale can be found in Supplemental Materials.

[2]Out of the 14 total items, this scale included 12 precautionary behaviors listed on the Center for Economic and Social Research's Coronavirus Tracking Survey - Long Form (https://www.phenxtoolkit.org/toolkit_content/PDF/CESR_UAS.pdf). The scale is in Supplemental Materials.

Figure 1

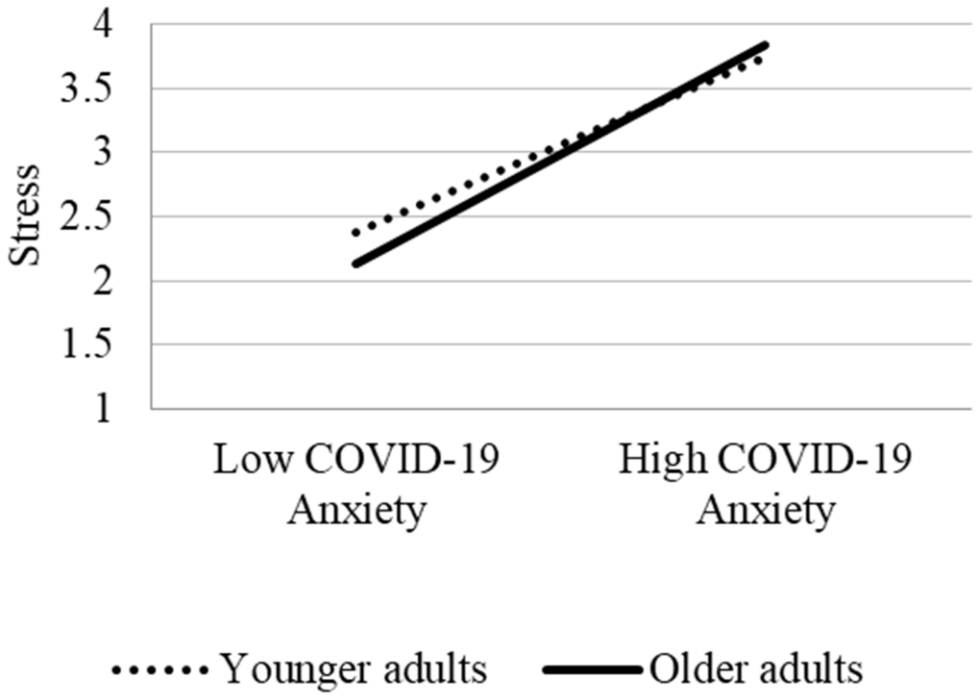

Figure 2