Age Moderates Perceived COVID-19 Disruption on Well-being

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Abstract

Background and Objectives: It is not fully understood how large-scale events affect well-being. Older adults showed the highest levels of resilience following the September 11th (9/11) terrorist attacks, but during the severe acute respiratory syndrome (SARS) outbreak there were no age-related differences in well-being. The current study examined the Coronavirus Disease 2019 (COVID-19) disruption on well-being throughout adulthood.

Research Design and Methods: Perceived stress and affect were examined in 166 community-dwelling adults (*M*age=35.65; *SD*=15.53; range=18-79) in relation to the perceived disruption of the COVID-19 pandemic to their lives.

Results: A significant moderation was found for age and COVID-19 disruption on perceived stress [$F(5, 153) = 8.88$, $p < .05$, $R^2 = .22$] and negative affect [$F(5, 154) = 4.91$, $p < .05$, $R^2 = .14$], but not for positive affect. For participants over 50, those who rated COVID-19 as a low or high disruption had similar scores on stress and negative affect, but with younger aged participants, perceiving high disruption corresponded with higher levels of stress and negative affect.

Discussion and Implications: Findings are consistent with the strength and vulnerability integration (SAVI) model, wherein older adults try to maintain positive emotional well-being; with middle-aged and older adults in the current study having experienced less negative impact on well-being. Middle-aged and older adults may be better able to regulate negative emotions, from COVID-19, than younger adults. SAVI proposes a greater negative impact on older adults when they experience sustained stressors; as the challenges with COVID-19 continue, further data will need to be examined.

Keywords: COVID-19, Well-being, Stress, Age-related differences

Introduction

Older adults, ethnic minorities, those with lower socioeconomic status, and those with underlying health conditions have disproportionality been affected by COVID-19 (Khunti, et al., 2020; Li, et al., 2020), through both higher rates of testing positive as well as greater mortality rates. There is a higher risk of infection for older adults living in nursing homes; over 40% of deaths attributed to COVID-19 have been associated with residential care facilities (NYTimes, 2020; Lloyd-Sherlock, et al., 2020). With the onset of COVID-19, older adults have experienced heightened ageism in public discourse as well as within institutional decision-making related to the allocation of medical resources and proposed distancing policies (Colenda, et al., 2020).

With the unease of potentially contracting the disease, changes in routine, worries about money, and fear for family members, many people are facing challenges to their well-being. Prime, Wade, and Browne (2020) suggest that the pandemic can have implications for the well-being of the whole family structure. COVID-19 can cause social disruptions (e.g. job loss, social distancing, confinement), which in turn, can affect an individual's well-being, as well as the well-being of their family members. These disturbances can affect a person directly and indirectly. It is important to assess the impact that the disruption of COVID-19 has on psychological well-being. Of particular interest, during this health crisis, is to understand how the impact on well-being may differ by age.

Well-being is a multifaceted and multidimensional construct, which includes an array of dimensions, including positive emotions, engagement in meaningful activities, interpersonal relationships, purpose in life, and a sense of accomplishment (Seligman, 2011). These broader aspects sometimes differ in their importance and interrelations at different points in the lifespan (Kern, et al., 2015). Emotional well-being has been shown to change over the lifespan, with an increase in positive affect and a decrease in negative affect as

people age (Carstensen, 1995). The strength and vulnerability integration (SAVI) model posits that older adults are motivated to enhance positive well-being and possess both age-related strengths and vulnerabilities in their pursuit of this goal (Charles, 2010). Additionally, older adults are better at regulating their negative affect when exposed to daily stressors, compared to younger adults (Scott, et al., 2013). Aging is related to an increase in strengths such as less reactivity to adverse events, a positivity bias with more focus on good rather than bad, and successful use of coping strategies, such as attentional focus and appraisal, with many of these changes slowly starting to take place in middle age. But, with increased age, it may also become more challenging to regulate sustained levels of arousal, making it harder to return to homeostasis when a long-term stressor is encountered (Charles, 2010).

Previous research examining well-being during crisis situations has provided mixed results on whether age groups are affected differently. It was found that older adults (65+) showed the highest levels of resilience to PTSD following the 9/11 terrorist attacks (Bonanno, et al., 2006). However, during the SARS outbreak of 2003, in Hong Kong, it was found that there were no age-related differences in well-being between older and younger adults (Lau, et al., 2008). Even in non-crisis situations, regardless of age, higher levels of global perceived stress heighten a person's negative affective response to stress (Scott et al., 2013); although, older adults in another study reported less of an increase in negative affect when faced with a daily stressor, compared to younger adults (Uchino, et al., 2006).

How a person interprets disruptions due to COVID-19 may differ from other crises. The risk of severe illness or death from COVID-19 increases with age, the greatest risk being for those over the age of 85 (CDC, 2020b). Furthermore, individuals with underlying medical conditions, those with disabilities, and racial and ethnic minorities may be differentially impacted by the effects of the pandemic (Lakhani, 2020; Raifman & Raifman, 2020; Webb Hooper, et al., 2020). Data from the National Center for Health Statistics and the Census

Bureau collected during the current pandemic has found that younger adults (age 18-29) are experiencing anxiety and depression at higher rates than any other age group, and less anxiety and depression with increased age (CDC, 2020a).

Although we are starting to learn about age-group differences in relation to COVID-19 disruption, it is not fully understood how age and well-being are associated during a crisis such as a global pandemic. The current study examined the association among age and COVID-19 disruption on stress and affect. Based on SAVI (Charles, 2010) and given trends in pathological well-being conditions (CDC, 2020a), it was anticipated that age would moderate the association between self-perceived disruption of COVID-19 on stress and negative affect, such that older participants would experience lower levels of stress and negative affect compared to younger participants.

Method

Participants

Participants were drawn from community-dwelling adults, with access to the internet, who responded to social media ads posted on various Facebook groups (e.g. buy/sell groups, groups for promoting surveys, groups that provide local/state information). Participants were invited to complete an online survey examining the effects of COVID-19 disruption, well-being, and health. All participants were entered into a drawing to win one of thirty $10 gift cards. Four participants were not included in analyses because they failed more than 2 attention checks (i.e. did not select "agree" when the question stated "select the agree option") within the survey. A total of 166 (74.1% from the mid-western United States) participants completed the survey (Age range 18-79 years, $M_{age} = 35.65$, $SD = 15.53$), with 81% of the sample being women ($n = 135$), and 94.5% of the sample being white ($n = 160$). The sample included 33.1% ($n = 55$) emerging adults (age range 18-24), 28.9% (n = 48) young adults (age range 25- 39), 28.3% ($n = 47$) middle-aged adults (age range 40-59), 7.8%

($n = 13$) older adults (age range 60-79), and 1.8% ($n = 3$) did not answer the question. Most (90%) reported that they were "currently following a stay-at-home order." All surveys were completed between March 30, 2020 and April 7, 2020. This research was approved through the University's Institutional Review Board (protocol #E20-35), and informed consent was obtained from each participant.

Measures

Perceived Stress. The Perceived Stress Scale (Cohen, et al., 1983; Cohen & Williamson, 1988) was used to index current evaluation of stress. The Perceived Stress Scale included 10 items, where each item was scored on a 5-point Likert scale (0 = Never to 4 = Very often), with a higher score representing greater perceived stress ($M = 19.99$, $SD = 7.31$, and $\alpha = .90$). See Table 1 for all means and standard deviations.

Positive and Negative Affect. The 10-item Philadelphia Geriatric Center Positive and Negative Affect Scales were used (Lawton, et al., 1992). Each item was rated on a 5-point Likert scale, and participants were asked how much they agree with how they currently feel (1 = strongly disagree to 5 = strongly agree) with a higher score endorsing greater levels of that emotion. The five positive emotions consisted of: *happy*, *interested*, *energetic*, *content*, and *warm-hearted* ($M = 16.40$, $SD = 3.42$, $\alpha = .77$) and the five negative emotions consisted of: *annoyed*, *worried*, *irritated*, *sad*, and *depressed* ($M = 14.14$, $SD = 4.71$, $\alpha = .86$).

COVID-19. A single-item assessed COVID-19 disruption, reading "The current situation with COVID-19 has been disruptive to your life," and rated on a 5-point Likert scale (1 = Disagree to 5 = Agree), $M = 4.57$, $SD = .87$.

Analytic Plan

With less than 2% of missing data from any variable, no imputations were conducted. A power analysis, using G*Power (Erdfelder, et al., 1996), suggested that data from 109 adults would provide sufficient power (power =.80) to detect medium-sized effects (f^2 =.15) in a 3-variable regression equation ($p < .05$). Because traditional approaches are not well-suited for estimating power in moderated regression analyses (Hayes, 2012), PROCESS was adopted, to allow for 5,000 bias-corrected boot-strapping samples to increase the stability of the beta weights. PROCESS (Hayes, 2012) was used to test whether age moderated the effect of COVID-19 disruption on various types of well-being, with race (coded as white/POC) and gender as covariates. Use of PROCESS allowed continuous variables to be automatically mean-centered; therefore, assumptions of generalized linear models were not violated.

<center>**Results**</center>

To ascertain the associations between age, COVID-19 disruption, and well-being, Pearson correlations were examined. Age was not significantly associated with COVID-19 disruption ($r(161) = -.05$, $p = .55$). A small but significant negative association between age and perceived stress ($r(162) = -.22$, $p = .00$) was observed. Similarly, a significant positive association emerged between COVID-19 disruption and perceived stress ($r(163) = .34$, $p = .00$), and between COVID-19 disruption and negative affect ($r(164) = .26$, $p = .010$. However, age was not significantly correlated with affect, with coefficients ranging from -.04 to .11, nor was there a significant association between COVID-19 disruption and positive affect. See Table 1 for all correlations.

Moderations of Age and COVID-19 on Well-being

$\qquad$ *Perceived Stress.* In the equation examining whether age moderated the effects of COVID-19 disruption on stress, an omnibus effect was detected [$F(5, 153) = 8.88$, $p < .05$, R^2 = .22]. Neither the covariates of race [$b = -1.42$, $p = .56$] nor gender [$b = -2.24$, $p = .06$] significantly contributed to the model, but there was a trend showing that women may have more perceived stress. Age [$b = -.10$, $p = .00$], COVID-19 disruption [$b = 3.50$, $p = .00$], and the interaction [$b = -.12$, $p = .00$] all uniquely contributed to the overall effect. By using the Johnson-Neyman technique (Hayes & Mattes, 2009), it was found that the effects of high and low disruption converge around the age of 52. High and low disruption show no significant differences, with increased age (after 52), for perceived stress. See Figure 1 for the interaction of age and COVID-19 on stress.

$\qquad$ *Positive Affect.* In the equation examining whether age moderated the effects of COVID-19 disruption on positive affect, no omnibus effects were detected [$F(5, 153) = .71$, p = .62, R^2 = .02].

$\qquad$ *Negative Affect.* In the equation examining whether age moderated the effects of COVID-19 disruption on negative affect, an omnibus effect was detected [$F(5, 154) = 4.91$, p < .05, R^2 = .14]. The covariate of gender [$b = -.50$, $p = .54$] did not significantly contributed to the model, but race [$b = -3.69$, $p = .03$] significantly contributed to the model, with white participants having higher negative affect. Age [$b = -.02$, $p = .44$] did not significantly contribute to the overall effect. However, COVID-19 disruption [$b = 1.82$, $p = .00$], and the interaction with age [$b = -.07$, $p = .01$] both uniquely contributed to the overall effect. By using the Johnson-Neyman technique (Hayes & Mattes, 2009), it was found that the effects of high and low disruption converge around the age of 48. High and low disruption show no significant differences, with increased age (after 48), for negative affect. See Figure 2 for the interaction of age and COVID-19 on negative affect.

Discussion

This study investigated whether age of the participant altered the association between subjective COVID-19 disruption and well-being. Consistent with SAVI (Charles, 2010) there was an overall moderating effect of age on the perceived disruption of COVID-19 to well-being association. Although, no differences in positive affect were found in the current study, perceived stress and negative affect were significantly affected. At younger ages, those reporting higher COVID-19 disruption also reported greater impacts on their well-being. The results of this study indicate that COVID-19 disruption appeared to have less of an effect on stress and negative affect with increased age. Based on Johnson-Neyman analyses, it was found that the effect of COVID-19 disruption on well-being doesn't vary between middle-aged (starting around the age of 50) and older adults, even if they perceived greater disruption. These results are consistent with Bonanno, et al. (2006) who found that older adults had the greatest resilience to PTSD following 9/11 and is consistent with the recent findings from the CDC (2020a) regarding clinical depression and anxiety. The current study adds to the literature by examining not just two age groups, but effects stemming multiple age periods. By including a representation of middle-aged adults, we were able to examine these associations through regression analyses.

There are debates on the challenges and relevance of studying stress retrospectively (Scott, et al. 2013). The current study adds to the body of research by examining stress and affect *during* the time of a, potentially, continuous stressor. Consistent with previous findings on stress (Uchino, et al., 2006), the current study found that when faced with a stressor, in this case a global pandemic, middle-aged and older adults may be better at regulating their emotions even when they perceive the stressor as disruptive. When examining the negative aspects of well-being, middle-aged and older adults may be better at regulating their own

emotional reaction to a major life stressor. This may be due, in part, to the fact that middle-aged and older adults may have faced more cumulative stressors (e.g., war, recession), and have more personal resources to deal with stressors. Emotional regulation exists within a larger framework of coping styles that can be enacted to manage situational responses (Marroquin, et al., 2017) with age-related differences indicating more frequent use of positive appraisal with increased age (Charles, 2010).

The current research has implications for understanding who may need emotional interventions or psychological counseling during a crisis experience. Recognizing the differential effects of individual coping styles when situated within the context of the situational severity, compounding stressors, and age-related differences may aid in identifying possible mechanisms that explain the age-related moderation of well-being related to COVID-19 disruption. Middle-aged and older adults may be better at regulating negative emotions, during the onset of a continuous stressor, than younger adults. The current study points to the idea that if a person feels a crisis is disruptive to their lives, the younger a person is, the greater impact on their perceived stress and negative affect. Although, the current study is consistent with SAVI, this theory also states that there may be a greater negative impact on older adults when they experience sustained stressors (Charles, 2010). The current results may change as the stressor continues, with profound implications on physical, psychological, and social well-being. As the COVID-19 pandemic continues to be a stressor, further research will need to be conducted to examine the long-term effects on stress and affect.

Limitations

Although representing all adult age periods is a strength of the current study because it fills gaps within previous research that only compared older and younger adults, it must be acknowledged that only 7.8% of the sample in this study represents older adults. By testing a limited number of older adults, the conclusions about older adults must be examined with caution. Because data were collected through a convenience sample online and may have unintentionally targeted specific groups based on where ads were posted, the limited generalizability of the sample must be acknowledged as evidenced by the large proportion of women and white, non-Hispanic, respondents. In future research, having a more diverse sample will help to clarify how the intersection of age, gender, and race affects perceptions of COVID-19 disruption in relation to well-being. Knowledge remains limited regarding disparities of the oldest adults. The intersection of age and race/ethnicity, and the moderating effects of age and COVID-19 disruption on well-being over a longer time period need to be examined further. Also, given the timing of the investigation in the progression of the COVID-19 pandemic, in the U.S. sample, the current study opted to only focus on the strengths brought about by age within the SAVI framework. An examination of the vulnerabilities would be a purposeful pursuit as the COVID-19 pandemic extends in time. Lastly, by using a single item to examine disruption of COVID-19, the current study is not able to capture the nuances of how disruption is experienced (e.g. loss of loved one, job changes, quarantine, etc.); as a subjective measure, differences in the interpretation of the rating scale might have also resulted. A multi-item, multi-faceted measure is recommended in future studies.

Conclusion

Despite the disruption of COVID-19 across all ages and the greater susceptibility of older adults to serious health and social consequences, the current study suggests that middle-aged and older adults experienced less distress than younger adults in response to their perceived disruptions. In the face of ageist media reports that paint aging adults as a vulnerable group, these are the type of strengths that can be highlighted to reframe ageist rhetoric. This finding suggests a protective advantage with increased age despite the profound effects of living through a time of global crisis, but also signals a potential cohort effect that may continually influence the lives and mental health needs of younger adults as they age. Those effects remain to be seen Although the pandemic provides everyone with the experience of navigating through a time of crisis, it has the potential to produce lasting strengths and vulnerabilities that are carried into the next crisis, strengths and vulnerabilities that will continue to be shaped by further experience and age-related change.

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Conflict of Interest

None

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Table 1. Means, standard deviations, and Pearson's correlations

	1	2	3	4
1. Age (*M* = 35.65, *SD* = 15.53)	-	-	-	-
2. COVID-19 Disruption (*M* = 4.57, *SD* = .87)	-.05	-	-	-
3. Positive Affect (*M* = 16.40, *SD* = 3.42)	.11	-.09	-	-
4. Negative Affect (*M* = 14.14, *SD* = 4.71)	-.04	.26*	-.63*	-
5. Perceived Stress (*M* = 19.99, *SD* = 7.31)	-.22*	.34*	-.34*	.60*

Note. * represents a *p* <.05

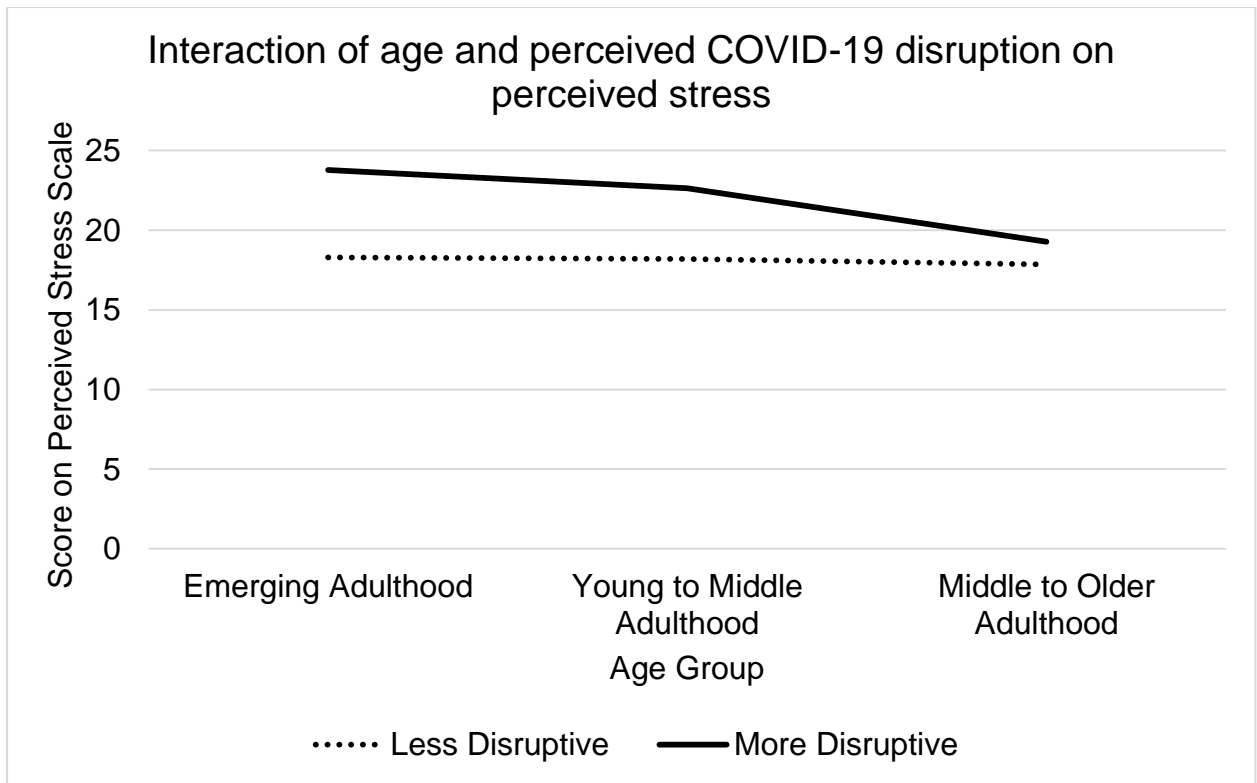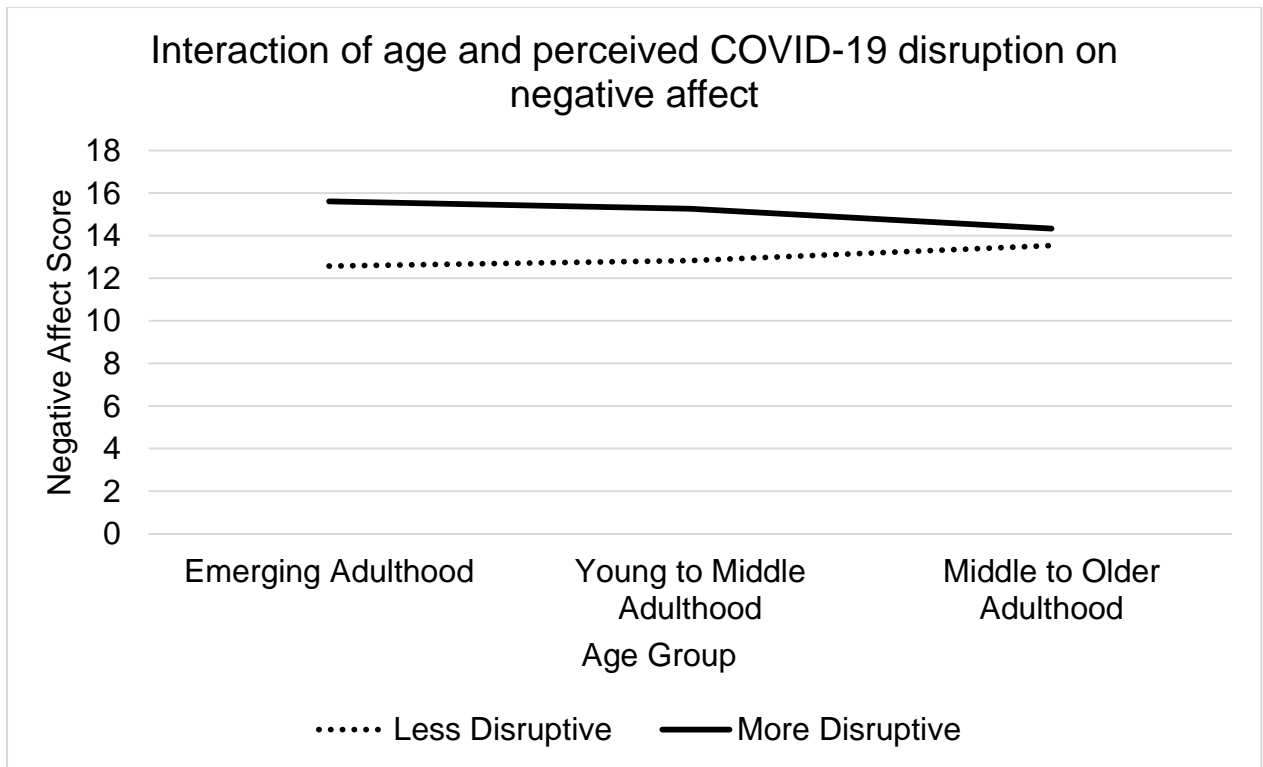*Figure 1*. Graph of the interaction between age on COVID-19 disruption on perceived stress.

Figure 2. Graph of the interaction between age on COVID-19 disruption on negative affect.