



Personal economic anxiety in response to COVID-19

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ARTICLE INFO

Keywords:

COVID-19
Economic anxiety
Demographics
Financial threat
Personality

ABSTRACT

The economic effects of COVID-19 have been far-reaching. Using a sample of adults from the United States ($n = 513$), the present study examined demographic and individual correlates of anxiety about financial hardship on March 17th, 2020, the day after historic stock market drops in response to the emerging COVID-19 crisis. Confirmatory factor analysis models determined that a unidimensional approach best accounted for covariation among types of economic anxiety. Zero-order and semi-partial correlations with economic anxiety were estimated. Younger adults tended to report greater anxiety than older adults. Black respondents reported significantly more anxiety, whereas respondents without children living at home reported less anxiety. Low collective self-esteem, low conscientiousness, and low openness to experience were associated with greater economic anxiety. High neuroticism, perceived vulnerability to disease, and belongingness stemming from large group activities also were associated with greater anxiety. The current study provides a first glance at individual differences in understanding who may experience economic anxiety due to the COVID-19 pandemic.

1. Introduction

The spread of the novel coronavirus (SARS-COV-2) has precipitated considerable economic shocks. The first record-setting plunge in the stock market occurred on March 9th with the largest single-day point loss for the Dow Jones Industrial Average. In response to the continued spread and global response to the COVID-19 crisis, the stock market plunged even further on March 12th and March 16th exacerbating fears of a global recession.¹ Our aim was to identify the characteristics of people who have experienced economic anxiety due to the COVID-19 crisis, specifically concerns about personal financial hardship. Consequently, we launched the present study one day after the last of those historic stock market plunges (March 17, 2020).

Economic anxiety is a pernicious form of psychological distress associated with deleterious outcomes. For example, studies focused on the 2008 recession found that the experience of economic hardship predicted divorce (Cohen, 2014) and suicide rates (Coope et al., 2014). A systematic review of the mental health outcomes of economic recessions found that periods of economic hardship were associated with a higher prevalence of common mental disorders and suicidal behavior (Frasquilho et al., 2015). The current study sought to test specific individual differences as correlates of economic anxiety, above and beyond demographic factors. Although distinct from the experience of

economic hardship, anxiety over the possibility of it may highlight the characteristics of those who may be most likely to experience mental and behavioral health sequelae of economic hardship.

The present study focuses on individual differences related to basic personality traits and group-related proclivities in the domains of health, social evaluations, and social connection. Specifically, we assessed perceived disease vulnerability, collective identity, social belongingness, and the Big Five personality domains. Perceived disease vulnerability taps people's concerns that they may be susceptible to illness and take action to avoid contagions (Duncan et al., 2009). Not only does perceived disease vulnerability have a strong connection to health concerns, beliefs that one is susceptible to pathogens also may generalize to heightened threat detection more broadly (Neuberg and Schaller, 2016). Hence, we predicted that perceived disease vulnerability would be associated with heightened economic anxiety.

Collective identity was measured using the race/ethnicity version of the collective self-esteem scale (Luhtanen and Crocker, 1992). Literature reviews have concluded that a benefit of self-esteem is to confer resiliency in the face of setbacks and threats (Baumeister et al., 2003), which may bear on people's perceptions of their economic prospects in the context of their racial or ethnic groups. The scale measures self-perceptions of being a worthy group member (membership self-esteem), the esteem that one has for one's group (private self-esteem),

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¹ Changes in the DJIA retrieved from <https://us.spindices.com/indexology/djia-and-sp-500/sizzlers-and-fizzlers>.

Table 1
Descriptive statistics for individual differences and economic anxiety.

<i>n</i> = 513	<i>k</i>	<i>M</i>	<i>SD</i>	Min	Max	Skew	Kurtosis	α	ω
Conscientiousness	3	3.33	0.50	1.67	5.00	-0.37	0.47	0.71	0.73
Agreeableness	3	3.23	0.67	1.33	5.00	-0.39	0.46	0.42	0.50
Neuroticism	3	2.53	1.04	1.00	5.00	0.18	-0.83	0.67	0.70
Openness to experience	3	3.75	0.94	1.00	5.00	-0.59	-0.17	0.67	0.68
Extraversion	3	2.93	0.96	1.00	5.00	0.00	-0.46	0.58	0.60
Membership self-esteem	4	5.10	1.09	1.00	7.00	-0.28	-0.36	0.69	0.81
Public self-esteem	4	4.85	1.08	1.00	7.00	-0.26	0.11	0.66	0.80
Private self-esteem	4	5.17	1.18	1.75	7.00	-0.20	-0.84	0.76	0.87
Identity self-esteem	4	3.94	1.51	1.00	7.00	0.00	-0.55	0.84	0.89
Perceived disease vulnerability	15	3.96	0.89	1.47	6.73	0.04	0.29	0.80	0.88
Propensity for collective assembly	11	4.19	0.86	1.33	6.24	-0.33	0.06	0.86	0.92
Economic anxiety	18	10.3	9.74	0.00	36.00	0.68	-0.73	0.95	0.96

Note. *k* = number of items per measure. *M* = mean. *SD* = standard deviation. Min = minimum observed score. Max = maximum observed score. α = Cronbach's alpha. ω = McDonald's omega.

beliefs about others' evaluation of one's group (public self-esteem), and the extent to which people's personal identity is influenced by their group membership (identity self-esteem). We had the strongest predictions about the three evaluative subscales, such that lower scores on those measures of collective self-esteem were thought to predict more economic anxiety, whereas the link to the inclusion of racial/ethnic identity in one's self-image (identity self-esteem) was uncertain.

The degree to which people derive social belongingness from being part of large group activities was measured using the effervescent collective assembly measure (Gabriel et al., 2017). The concept of collective effervescence, originating from Durkheim (1912), pertains to feelings of solidarity and connectedness from fun-filled large group events (e.g., festivals, concerts), as well as somber public events (e.g., public memorials). Collective effervescence is a form of social connection that is distinctly threatened by social distancing guidelines. Hence, we predicted that people who report stronger collective effervescence motivations, who are thus deprived of opportunities to fulfill this form of social connection, would feel more anxious about potential financial hardships.

The Big Five domains of personality capture fundamental organizing axes of variation in affect, behavior, and motivation. People with a tendency to experience high levels of neuroticism were predicted to experience high levels of economic anxiety due the COVID-19 crisis. Therefore, we predicted that high levels of neuroticism would be associated with economic anxiety. We had no strong predictions for the other Big Five domains of personality.

2. Methods

2.1. Sample

First, we conducted an a priori power analysis using G*Power 3.1 (Erdfelder et al., 1996). For a multiple linear regression with thirteen covariates, assuming small-to-moderate effect sizes (partial $R^2 = 0.05$), a sample size of $n = 488$ is needed to achieve high power (95%) to detect the incremental effects of 11 independent variables. Consequently, an online survey was collected from a sample of 513 adults using the Amazon's Mechanical Turk Prime platform. Data collection began on March 17th. Participants were notified of an opportunity to "provide your evaluations on multiple measures such as demographics, risk perceptions, and thoughts about COVID-19. The study should take about 10 minutes to complete". All study participants had IP addresses from the United States and were compensated \$1.00.

Approximately 46% of the sample was female. The age of participants spanned 20 to 79 years ($mean = 38.55$, $SD = 11.91$). The majority of the sample was White (~75%). Approximately 10% of participants were Black, 7% were Asian, and 6% were Latino. Fewer than 2% of participants reported being Native American, Pacific Islander, or

Other Ethnicity. With respect to marital status, approximately 39% of participants were single, 41% were married, 10% were living with a partner but not married, 7% were either separated or divorced, 2% were widowed, and less than 1% reported "Other" marital status.

With respect to socioeconomic status, we measured education attainment, earnings, and employment status. For educational attainment, 10% of participants completed a high school diploma or general education diploma. Approximately 28% of participants attended college without completing a degree, whereas 50% and 12% of participants completed a college degree or an advanced degree, respectively. For earnings, approximately 27% of participants reported earning \$25k-\$50k a year, 39% reported \$50k-\$75k, 22% reported \$75k-\$100k, and 12% reported earning more than \$100k a year. The majority of the sample was employed full-time (~79%), while 9% was employed part-time, 5% was unemployed, and the remaining 6% were students, retired, or disabled.

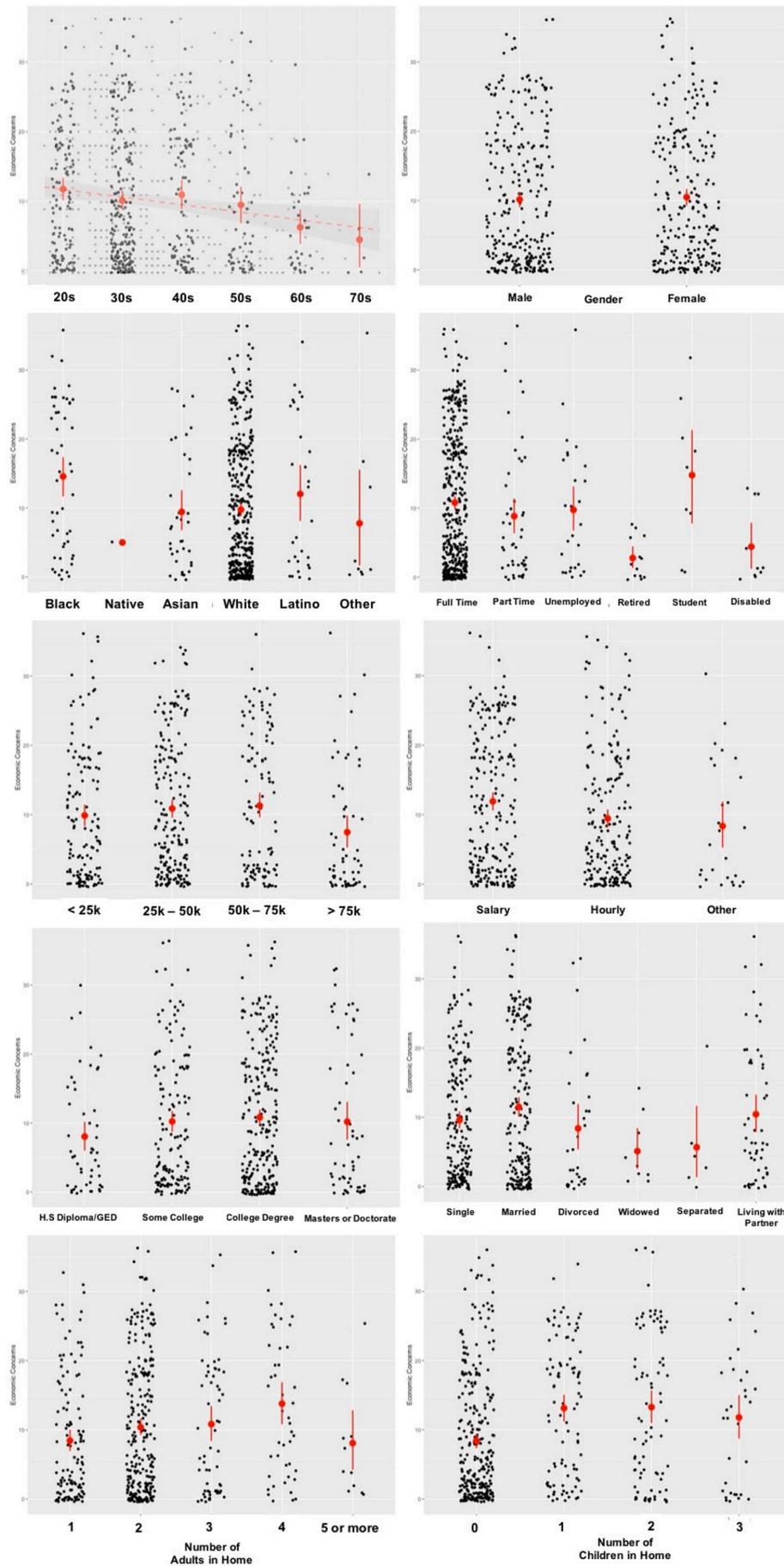
Household composition reports indicated that approximately 25% of participants lived alone and 51% lived with another adult, mirroring the 51% who either were married or living with a partner. Households with three and four adults for approximately 12% and 9% of participants and 2% had five or more adults living in their home. In terms of the number of children living at home, approximately 59% reported none, 18% reported one child, 16% reported two children, 5% reported three children, and 1% reported 4 or more children.

3. Measures

Economic anxiety was measured using an adapted version of an economic hardship scale. Previous research validated its use for financial hardship specifically in response to an economic recession (Kirsch and Ryff, 2016), the original version of which was developed from a national survey of unemployed adults (Borie-Holtz et al., 2010). Participants in the current study rated the extent to which they were concerned about economic hardships that may befall them due to the COVID-19 crisis (0 = not concerned, 1 = somewhat concerned, 2 = very concerned). Four items pertained to employment (e.g., "lose my job"), seven pertained to housing (e.g., "miss a mortgage or rent payment for housing"), and seven pertained to other financial impacts (e.g., "miss a credit card payment").

Deriving belongingness from participating in large groups was measured using the tendency for effervescent assembly scale (Gabriel et al., 2017). Eleven items assessed large group social needs (e.g., I feel very connected to others when in a large group activity, I like going to a concert, church, or convention). Responses were given on a 7-point scale (1 = Strongly Disagree; 4 = Neutral; 7 = Strongly Agree).

The perceived vulnerability to disease scale (Duncan et al., 2009) consists of 15 items measuring beliefs and concerns about contracting an illness (e.g., "I have a history of susceptibility to infectious disease"),



(caption on next page)

Fig. 1. Demographics of economic anxiety in response to COVID-19.

Notes. Black dots indicate individual observations. Red dots indicate arithmetic means. Red bars indicate 95% bootstrapped confidence intervals. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

as well as behaviors intended to minimize the likelihood of becoming ill (e.g., “I prefer to wash my hands pretty soon after shaking someone’s hand”). One item was deemed inapplicable because it referred to the use of public telephones, so we substituted the word toilet for telephone. Participants rated their agreement using 7-point scales (1 = Strongly Disagree; 4 = Neutral; 7 = Strongly Agree).

Racial/ethnic identity was measured using the race-specific version of the collective self-esteem scale (Luhtanen and Crocker, 1992). The 16-item scale measures four components of social identity: membership self-esteem (e.g., I am a cooperative participant in the activities of my racial/ethnic group), public self-esteem (e.g., in general, others respect my race/ethnicity), private self-esteem (e.g., I feel good about the race/ethnicity I belong to), and identity self-esteem (e.g., in general, belonging to my race/ethnicity is an important part of my self-image). Participants rated their agreement with each item using a 7-point scale (1 = Strongly Disagree; 4 = Neutral; 7 = Strongly Agree). The scale authors advised against creating a composite score as different aspects of collective self-esteem may be uncorrelated (Crocker et al., 1994).

Personality traits were measured using the extra-short form of the Big Five Inventory (BFI; Soto and John, 2017), which uses three items to capture variation in each of the Big Five domains: conscientiousness (e.g., “tends to be disorganized”), agreeableness (e.g., “is compassionate, has a soft heart”), neuroticism (e.g., “worries a lot”), openness to experience (e.g., “is original, comes up with new ideas”), and extraversion (e.g., “is dominant, acts as a leader”). Items were rated using a 5-point ordinal scale (1 = Disagree Strongly; 3 = Neutral; 5 = Agree Strongly).

4. Results

4.1. Confirmatory factor analysis models

The items used to measure economic anxiety were organized along three dimensions (i.e., anxiety about job, home, and financial hardships). Consequently, one-factor, two-factor, and three-factor models were examined to determine the number of scales for economic anxiety. First, all 18 items were specified to load onto a single factor. Second, the 11 items that measured anxiety about job and financial hardship were specified to load onto one factor, while the seven items that measured anxiety about home impact were specified to load onto a second factor. Third, items that measured anxiety about job, financial, and home impact were specified to load onto three factors.

All factors were scaled using unit loading identification, each item was specified to loaded onto only one factor, correlations between factors were estimated, and correlations between residuals were fixed to zero. Items were treated as ordered-categorical indicators, and confirmatory factor analysis (CFA) models were estimated using robust weighted least squares. Demographic variables were specified as exogenous covariates of factors. Model fit was assessed using root mean squared error of approximation (RMSEA) and comparative fit index (CFI). Models were compared using $\Delta RMSEA$ and ΔCFI ; changes less than or equal to 0.01 suggest the more parsimonious model should be accepted (Cheung and Rensvold, 2002).

The single factor model fit the data well ($\chi^2 = 771.00$, $df = 373$, $p < .001$, $RMSEA = 0.046$, $CFI = 0.980$). Standardized loadings were moderate-to-high and statistically significant for all indicators of economic anxiety (mean $\lambda = 0.83$, range of $\lambda = 0.55$ to 0.89 , $ps < .001$). The two-factor model fit the data well ($\chi^2 = 686.84$, $df = 358$, $p < .001$, $RMSEA = 0.043$, $CFI = 0.984$), as did the three-factor model ($\chi^2 = 637.20$, $df = 342$, $p < .001$, $RMSEA = 0.041$, $CFI = 0.985$). $\Delta RMSEA$ (-0.003 & -0.005) and ΔCFI (0.004 & 0.005) suggested the

more parsimonious single-factor model should be retained. Correlations between latent factors were positive and high (range of $r = 0.89$ to 0.93 , $ps < .001$), providing little evidence for multiple latent factors. Additionally, Cronbach’s alpha ($\alpha = 0.95$) and McDonald’s omega ($\omega = 0.96$) provided support for the internal consistency of a unidimensional scale. Therefore, a single-factor solution was selected as the best-fitting model, and a sum scores was computed.

4.2. Descriptive statistics

Descriptive statistics are reported in Table 1. A histogram and density plot indicated that the measure of economic anxiety was zero-inflated. Approximately 15% of adults reported no economic anxiety, and 10% reported they were only “somewhat concerned” about a single financial hardship. Therefore, 95% bootstrapped confidence intervals were estimated for multiple regression coefficients using 1000 replicate samples. For sensitivity analyses, we operationalized economic anxiety using both observed and latent variables.

4.3. Demographic differences

For continuous variables, zero-order correlations (r) and standardized regression coefficients (β) are reported. For binary and ordinal variables, standardized regression coefficients are reported for dummy-coded variables (No = 0, Yes = 1), such that β is interpreted as differences in economic anxiety in standard deviation units, assuming membership in a demographic group (Fig. 1). Age was negatively correlated with economic anxiety ($r = -0.13$, $SE = 0.04$, $p = .002$). The difference between men and women was small ($\beta = 0.07$, $SE = 0.09$, $p = .462$). Black respondents reported more economic anxiety than did others ($\beta = 0.49$, $SE = 0.16$, $p = .002$) and White respondents less anxiety compared to others ($\beta = -0.22$, $SE = 0.11$, $p = .035$).

Being retired ($\beta = -0.80$, $SE = 0.09$, $p < .001$) or disabled ($\beta = -0.80$, $SE = 0.09$, $p < .001$) were negatively associated with economic anxiety. Pairwise comparisons across categories of employment using Tukey’s range test indicated that retired adults reported less economic anxiety than employed adults (Cohen’s $d = 0.83$, $p = .038$) and students (Cohen’s $d = 1.69$, $p = .048$); All other pairwise differences were not statistically significant.

Adults who earned greater than \$75,000 a year reported less economic anxiety than adults who earned less ($\beta = -0.33$, $SE = 0.13$, $p = .014$). Economic anxiety was not significantly different across other income brackets. Source of income was significantly associated with economic anxiety, such that earning a salary was associated with greater anxiety ($\beta = 0.26$, $SE = 0.09$, $p = .004$), and earning an hourly wage was associated with less anxiety ($\beta = -0.21$, $SE = 0.09$, $p = .022$). Using Tukey’s range test, pairwise comparisons (salary vs. hourly vs. other) indicated that adults who were paid hourly reported less anxiety than adults who earned a salary (Cohen’s $d = 0.25$, $p = .025$).

Average economic anxiety was lower for those who did not have any children living in their home ($\beta = -0.47$, $SE = 0.09$, $p < .001$). Moreover, Tukey’s range test indicated that, compared to having one child, economic anxiety was lower for those who had no children living at home (Cohen’s $d = 0.52$, $p < .001$). Compared to having two or more children, economic anxiety was not significantly different from those with only one child ($ps > .05$). Economic anxiety was not significantly different across levels of educational attainment, marital status, or number of adults living at home ($ps > .05$).

Table 2
Zero-order correlations between individual difference variables and economic anxiety about the COVID-19 crisis.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. Conscientiousness	1.00	.06 (-.02, .15)	-.48*** (-.54, -.41)	.23*** (.15, .31)	.24*** (.16, .32)	-.16*** (-.25, -.08)	.27*** (.19, .35)	.19*** (.10, .27)	-.03 (-.12, .06)	-.03 (-.12, .06)	-.02 (-.10, .07)	-.15*** (-.23, -.06)
2. Agreeableness	.07* (.02, .13)	1.00	-.15*** (-.23, -.06)	-.29*** (-.37, -.21)	.06 (-.02, .15)	.03 (-.06, .11)	.05 (-.03, .14)	.09* (.01, .18)	.11* (.02, .19)	.11* (.02, .20)	.17*** (.08, .25)	.01 (-.07, .10)
3. Neuroticism	-.40*** (-.45, -.35)	-.12*** (-.18, -.07)	1.00	-.21*** (-.29, -.12)	-.44*** (-.51, -.37)	.24*** (.16, .32)	-.40*** (-.47, -.33)	-.17*** (-.25, -.08)	-.02 (-.11, .06)	-.02 (-.11, .06)	-.14** (.06, .23)	.28*** (.20, .36)
4. Openness	.21*** (.16, .27)	-.19*** (-.25, -.13)	-.18*** (-.24, -.12)	1.00	-.44*** (-.51, -.37)	-.10* (-.18, -.01)	.25*** (.17, .33)	.10* (.01, .19)	-.01 (-.10, .07)	-.01 (-.10, .07)	.13** (.05, .22)	-.12** (-.20, -.03)
5. Extraversion	.20*** (.14, .25)	.07* (.01, .13)	-.31*** (-.37, -.26)	.17*** (.11, .23)	1.00	-.09* (-.17, -.00)	.29*** (.20, .36)	.06 (-.02, .15)	.16*** (.07, .24)	.16*** (.07, .24)	.23*** (.15, .31)	.00 (-.08, .09)
6. Disease Vulnerability	-.12*** (-.18, -.07)	.01 (-.05, .07)	.19*** (.13, .25)	-.07* (-.13, -.01)	-.04 (-.11, .02)	1.00	-.07 (-.16, .01)	-.13** (-.22, -.05)	-.10* (-.02, .19)	-.10* (.02, .19)	.56*** (.50, .61)	.25*** (.17, .33)
7. Membership CSE	.22*** (.16, .27)	.06 (.00, .12)	-.30*** (-.36, -.25)	.22*** (.18, .28)	.19*** (.14, .25)	-.05 (-.12, .01)	1.00	.45*** (.38, .52)	.35*** (.27, .42)	.35*** (.27, .42)	.08* (.00, .17)	-.28*** (-.36, -.20)
8. Public CSE	.15*** (.09, .20)	.08** (.03, .14)	-.15*** (-.21, -.09)	.12*** (.06, .18)	.03 (-.03, .09)	-.11*** (-.17, -.05)	.40*** (.34, .45)	1.00	.18*** (.10, .26)	.18*** (.10, .26)	-.07 (-.15, .02)	-.24*** (-.32, -.16)
9. Private CSE	-.02 (-.07, .04)	.08* (.02, .14)	-.01 (-.08, .05)	.00 (-.06, .06)	.13*** (.07, .19)	.07* (.01, .14)	.26*** (.20, .32)	.13*** (.07, .19)	1.00	.42*** (.34, .49)	-.05 (-.14, .03)	-.34*** (-.42, -.26)
10. Identity CSE	-.02 (-.07, .04)	.08* (.02, .14)	-.01 (-.08, .05)	.00 (-.06, .06)	.13*** (.07, .19)	.07* (.01, .14)	.26*** (.20, .32)	.13*** (.07, .19)	.31*** (.25, .36)	1.00	.25*** (.16, .33)	.05 (-.03, .14)
11. Collective Assembly	-.02 (-.08, .04)	.13*** (.07, .18)	.09** (.03, .15)	.09** (.03, .14)	.17*** (.12, .23)	.40*** (.35, .45)	.07* (.01, .17)	-.06* (-.12, .00)	-.04 (-.10, .03)	.17*** (.11, .23)	1.00	.32*** (.24, .39)
12. Economic Anxiety	-.13*** (-.18, -.07)	-.02 (-.07, .04)	.23*** (.17, .28)	-.10** (-.16, -.04)	.00 (-.06, .06)	.20*** (.14, .26)	-.21*** (-.27, -.16)	-.20*** (-.25, -.14)	-.26*** (-.31, -.20)	.04 (-.01, .10)	.22*** (.16, .28)	1.00

Notes. Pearson's correlations and Kendall's rank-order correlations are reported above and below the diagonal, respectively. 95% confidence intervals are reported in parentheses below point estimates. One, two, and three asterisks indicate $p < .05$, $p < .01$, & $p < .001$.

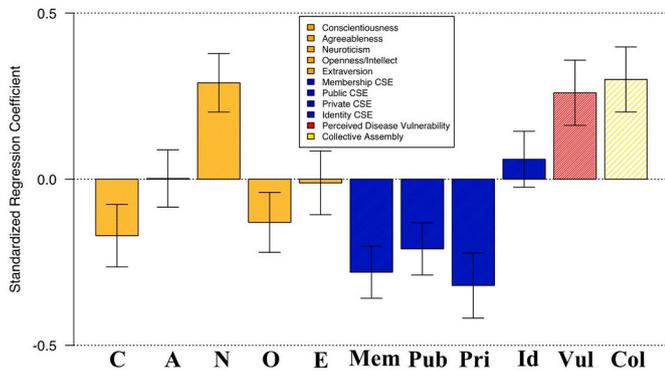


Fig. 2. Individual differences associated with economic anxiety in response to COVID-19 controlling for demographic differences.

Notes. Bars depict the direction and size of multiple standardized regression coefficients. Bars depict 95% bootstrapped confidence intervals.

4.4. Individual difference correlates

Pearson's correlations and Kendall's tau are reported in Table 2. Semi-partial associations with economic anxiety were estimated by regressing economic anxiety simultaneously on demographic variables and each individual difference variable. These regressions tested whether individual difference variables were associated with economic anxiety after accounting for demographic differences (Fig. 2; Table 3). Next, to help control for the collinearity among variables, economic anxiety was regressed simultaneously on demographic variables and all individual difference variables. These regressions tested whether individual difference variables were associated with economic anxiety, after accounting for demographic differences and the simultaneous influence of the other individual differences. Due to the number of individual difference variables in multiple regressions (11), we adopted a Bonferroni-adjusted threshold for evaluating the significance of these associations ($p < .05/11 = .0045$).

Most central to our hypotheses were the two individual differences that related most directly to the pandemic itself — perceived vulnerability to disease and belongingness from collective assembly. Controlling for demographic factors, both still positively predicted economic anxiety (Table 2; Fig. 2). Moving to collective self-esteem, which also may bear on the economic outcomes of the COVID-19 pandemic, racial/ethnic membership esteem was negatively associated with economic anxiety, as were the public and private self-esteem subscales. In contrast, collective identity self-esteem was not significantly associated with economic anxiety. Last, three personality characteristics were associated with economic anxiety after controlling for demographic variables. Conscientiousness and openness to

experience negatively predicted economic anxiety whereas neuroticism was a positive concurrent predictor.

In order to assess the unique contributions of individual differences in explaining economic anxiety due to COVID-19, a final model regressed economic anxiety on all demographic and individual difference variables simultaneously. In this way, the demographic and individual difference variables must compete with one another to explain variation in economic anxiety. In that model, belongingness from collective assembly ($\beta = 0.23, SE = 0.06, p < .001$), racial/ethnic membership self-esteem ($\beta = -0.16, SE = 0.07, p = .016$), racial/ethnic private self-esteem ($\beta = -0.21, SE = 0.07, p = .002$), and neuroticism ($\beta = 0.15, SE = 0.05, p = .007$) continued to be significant concurrent predictors of economic anxiety, although only associations with collective assembly and private self-esteem met Bonferroni-adjusted thresholds for statistical significance.

5. Discussion

The current study was born out of observing the precipitous drops in the U.S. stock market as the world came to realize it was mired in a global pandemic. Though we collected data before widespread workplace shutdowns, the intuition that economic hardships may impose heavy psychological tolls has been bolstered by recent projections that the COVID-19 crisis is likely to exact devastating economic consequences (Baldwin and Tomiura, 2020).

We studied anxiety over the potential economic hardships that may befall people due to the COVID-19 pandemic. After accounting for demographic factors and measures of individual differences, four individual differences variables emerged as unique predictors of economic anxiety. Namely, proclivity for collective assembly and neuroticism positively predicted economic anxiety, and collective membership and private self-esteem were negative correlates, such that higher levels of self-esteem were associated with lower economic anxiety.

For people whose social needs are rooted in large group assemblies, the COVID-19 crisis presents a particular challenge. To be sure, people can substitute other relationship types (e.g., intimate partners) to satisfy their need to belong (Baumeister & Leary, 1995) but for individuals who relish in large group activities, that form of belongingness all but vanished with COVID-19 precautions that limited social contact. That this individual difference tracked with economic anxiety may reflect types of employment favored by people higher in this trait or that large group activities being curtailed signaled large-scale societal changes, leading to broader economic worries.

As for collective self-esteem, people who feel they are valued members of their ethnic group (membership esteem) and are personally glad to be a part of their ethnic group (private esteem) were less

Table 3 Results of multiple regression models predicting economic anxiety from individual difference variables controlling for demographic factors.

Predictors	Economic anxiety: Observed scale			Economic anxiety: Latent factor		
	β	SE	p	β	SE	p
Conscientiousness	-0.16	0.05	<.001	-0.17	0.05	<.001
Agreeableness	0.00	0.04	.973	0.00	0.05	.987
Neuroticism	0.26	0.04	<.001	0.29	0.04	<.001
Openness to experience	-0.12	0.05	<.001	-0.13	0.05	.006
Extraversion	-0.01	0.04	.782	0.01	0.04	.831
Membership self-esteem	-0.27	0.04	<.001	-0.28	0.04	<.001
Public self-esteem	-0.20	0.04	<.001	-0.21	0.05	<.001
Private self-esteem	-0.30	0.04	<.001	-0.32	0.05	<.001
Identity self-esteem	0.05	0.04	.241	0.06	0.05	.222
Perceived disease vulnerability	0.23	0.04	<.001	0.26	0.05	<.001
Propensity for collective assembly	0.26	0.04	<.001	0.30	0.05	<.001

Notes. Demographic factors were included as exogenous covariates. β = standardized multiple regression coefficient. SE = standard error. p = probability of the estimated coefficient if the null hypothesis is true.

concerned about economic hardships. These results may be explained by meta-analytical results showing a link between socioeconomic status (of which income is a part) and self-esteem (Twenge and Campbell, 2002). Extending those authors' theorizing, self-esteem may be partially grounded in economic prospects, which may be tied to racial or ethnic group membership.

Finally, a recent study found that age and neuroticism were associated with willingness to accept social restrictions (Zettler et al., 2020), which were also related to economic anxiety in the present study. The association with neuroticism is also consistent with the finding that individuals who tend to worry (worrying being an indicator of neuroticism) report greater perceived financial threat (Marjanovic et al., 2013).

The current study implemented a cross-sectional design making the nature of the documented associations difficult to discern. Future studies may benefit from implementing a longitudinal design to measure economic anxiety to document predictors of within-individual change. As a natural event, the COVID-19 crisis afforded a unique opportunity to study the correlates of economic anxiety during the emergence of a global pandemic and economic recession. The current study provides a snapshot of economic anxiety in response to rapidly changing political, social, and economic prospects.

CRedit authorship contribution statement

Frank D. Mann: Software, Formal analysis, Writing - original draft, Visualization. **Robert F. Krueger:** Conceptualization, Methodology, Writing - review & editing, Supervision. **Kathleen D. Vohs:** Conceptualization, Methodology, Writing - review & editing, Project administration, Investigation, Data curation.

Acknowledgements

There is no formal funding to disclose.

Declaration of competing interest

The authors have no competing interests to report.

References

Baldwin, R., & Tomiura, E. (2020). 5 thinking ahead about the trade impact of COVID-19.

- Economics in the time of COVID-19*. Unpublished Preprint available http://www.sensiblepolicy.com/download/2020/2020WorkingPapers/2020_19_CAMA_COVID19_mcKibbin_fernando_0.pdf.
- Baumeister, R. F., Campbell, J. D., Krueger, J. L., & Vohs, K. D. (2003). Does high self-esteem cause better performance, interpersonal success, happiness, or healthier lifestyles? *Psychological Science in the Public Interest*, 4, 1–44.
- Baumeister, R. F., & Leary, M. R. (1995). The need to belong: desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, 117(3), 497–529.
- Borje-Holtz, D., Van Horn, C., & Zukin, C. (2010). *No end in sight: The agony of prolonged unemployment*. John J. Heldrich Center for Workforce Development. Rutgers University.
- Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling*, 9(2), 233–255.
- Cohen, P. N. (2014). Recession and divorce in the United States, 2008–2011. *Population Research and Policy Review*, 33(5), 615–628.
- Coope, C., Gunnell, D., Hollingworth, W., Hawton, K., Kapur, N., Fearn, V., & Metcalfe, C. (2014). Suicide and the 2008 economic recession: Who is most at risk? Trends in suicide rates in England and Wales 2001–2011. *Social Science and Medicine*, 117, 76–85.
- Crocker, J., Luhtanen, R., Blaine, B., & Broadnax, S. (1994). Collective self-esteem and psychological well-being among White, Black, and Asian college students. *Personality and Social Psychology Bulletin*, 20(5), 503–513.
- Duncan, L. A., Schaller, M., & Park, J. H. (2009). Perceived vulnerability to disease: Development and validation of a 15-item self-report instrument. *Personality and Individual Differences*, 47(6), 541–546.
- Durkheim, E. (1912). *The elementary forms of the religious life*. New York, NY: The Free Press.
- Erdfelder, E., Faul, F., & Buchner, A. (1996). GPOWER: A general power analysis program. *Behavior Research Methods, Instruments, and Computers*, 28(1), 1–11.
- Frasquilho, D., Matos, M. G., Salonna, F., Guerreiro, D., Storti, C. C., Gaspar, T., & Caldas-de-Almeida, J. M. (2015). Mental health outcomes in times of economic recession: A systematic literature review. *BMC Public Health*, 16(1), 115–155.
- Gabriel, S., Valenti, J., Naragon-Gainey, K., & Young, A. F. (2017). The psychological importance of collective assembly: Development and validation of the Tendency for Effervescent Assembly Measure (TEAM). *Psychological Assessment*, 29(11), 1349.
- Kirsch, J. A., & Ryff, C. D. (2016). Hardships of the Great Recession and health: Understanding varieties of vulnerability. *Health Psychology Open*, 3(1), Article 2055102916652390.
- Luhtanen, R., & Crocker, J. (1992). A collective self-esteem scale: Self-evaluation of one's social identity. *Personality and Social Psychology Bulletin*, 18(3), 302–318.
- Marjanovic, Z., Greenglass, E. R., Fiksenbaum, L., & Bell, C. M. (2013). Psychometric evaluation of the Financial Threat Scale (FTS) in the context of the great recession. *Journal of Economic Psychology*, 36, 1–10.
- Neuberg, S. L., & Schaller, M. (2016). An evolutionary threat-management approach to prejudices. *Current Opinion in Psychology*, 7, 1–5.
- Soto, C. J., & John, O. P. (2017). Short and extra-short forms of the Big Five Inventory-2: The BFI-2-S and BFI-2-XS. *Journal of Research in Personality*, 68, 69–81.
- Twenge, J. M., & Campbell, W. K. (2002). Self-esteem and socioeconomic status: A meta-analytic review. *Personality and Social Psychology Review*, 6, 59–71.
- Zettler, I., Schild, C., Lilleholt, L., & Böhm, R. (2020). *Individual differences in accepting personal restrictions to fight the COVID-19 pandemic: Results from a Danish adult sample*. (Preprint posted to PsyArxiv on March 23, 2020).