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Personal harm from the Covid-19 pandemic predicts advocacy for equality☆

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ABSTRACT

The Covid-19 pandemic has laid bare the vast amount of economic inequality in the U.S. Yet, has it influenced Americans' attitudes and behaviors toward equality? With a three-wave longitudinal survey, the current research provides evidence that experiencing personal harm (e.g., contracting Covid-19, losing jobs, or psychological distress) from the pandemic predicts an increase in people's attitudinal and behavioral advocacy for equality. Specifically, we find that experiencing greater personal harm in the early stages of the pandemic (i.e., May 2020) is associated with increased advocacy for equality one year later (i.e., May 2021; e.g., contacting a public official to express support for reducing inequality). Furthermore, we find that this increase in advocacy for equality is explained, in part, by people's greater endorsement of the external factors (e.g., bad luck, discrimination, etc.) that contribute to inequality. Our work provides evidence that the extent to which people experience harm from the Covid-19 pandemic predicts both their increased understanding of external sources of inequality, as well as their efforts to combat this inequality (e.g., by advocating for policies that combat structural contributors to inequality).

At the start of the pandemic, many believed that Covid-19 would be a "great equalizer" (Owoseje, 2020). It seemed that regardless of socio-economic status, everyone was likely to face great uncertainty and interruptions to daily routines. Nevertheless, it quickly became clear that the pandemic was not an equalizer. Throughout the pandemic, lower- (vs. higher-) income populations have experienced greater health risks, more joblessness, and greater declines in psychological well-being (Brown & Ravallion, 2020; Perry, Aronson, & Pescosolido, 2021). At the same time, the wealth of America's billionaires has grown (Collins, 2021).

While the pandemic was not the great equalizer it was predicted to be, might it have still influenced Americans' attitudes and behaviors toward equality? For perhaps the first time on a broad scale, many people who were healthy and financially secure had trouble paying their bills or lost their job, had their working hours reduced, got sick, or experienced psychological distress due to a force that was clearly beyond their control—the Covid-19 pandemic. In other words, many experienced firsthand the sometimes-devastating results of an external and uncontrollable force constraining their lives. On the other hand, some continued to go about their day-to-day lives as normal and managed to remain relatively unharmed by the ravages of the pandemic.

The current work examines how experiencing personal harm from Covid-19 pandemic relates to people's advocacy for equality. By *personal harm*, we mean experiencing firsthand physical, financial, and/or psychological adversity that can be attributed to the Covid-19 pandemic. We theorize that the Covid-19 pandemic will influence Americans' attitudes and behaviors toward equality insofar as people were personally harmed by the pandemic. Specifically, we anticipate that the more people experience personal harm due to an external force outside of their control, the more this personal experience will make salient how forces outside of people's control (i.e., external factors) can fuel inequality. For example, if an individual had their hours cut due to the economic fallout of the pandemic (an external force outside of one's control), this experience should make it harder to deny that external

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forces outside of people's control can shape and constrain behaviors and financial outcomes. When people better recognize how these external constraints shape people's behavior and outcomes, we anticipate that they will do more to advocate for equality (i.e., support policies, like universal healthcare or basic income, that target the structural sources of inequality). In contrast, we anticipate that if people have *not* been harmed personally by a clearly external and uncontrollable force, they will not be more likely to advocate for equality.

1. Attributions and advocacy for equality

Psychologists have grappled with the question of why Americans generally support the substantial levels of existing inequality in U.S. society and take little action to advocate for equality (Bartels, 2005; Davidai, 2018; Norton & Ariely, 2011; Putnam, 2015). One pervasive psychological process that shapes advocacy for equality is the extent to which people see the source of inequality as a product of individuals (e.g., differences in work ethic) or as a product of larger structural, external, and uncontrollable factors (e.g., different educational opportunities).

Americans tend to explain people's life outcomes as free from the constraints of history, other people, and social systems. Instead, life outcomes are seen as a product of individuals' personal preferences, choices, or enduring characteristics (Gilbert & Malone, 1995; Markus, 2017; Markus & Kitayama, 2010). Therefore, important life outcomes, such as poverty or wealth, are often explained in terms of *internal* attributions (Adeola, 2005; Bénabou & Tirole, 2006; Cozzarelli, Wilkinson, & Tagler, 2001; Gudrais, 2008; Kluegel & Smith, 1986; Stephens, Fryberg, Markus, & Hamedani, 2013; Stephens & Levine, 2011; Stuber, 2006). For instance, inequality is frequently seen as the "natural," controllable, and deserved result of differences in individuals' merit or ambition.

Although the dominant ideology in the U.S emphasizes individual control over outcomes like wealth or poverty, previous research finds that it is possible for Americans to better recognize how *external* factors (e.g., societal opportunity) shape inequality. For example, increasing exposure to inequality (e.g., via a poverty simulation, working in under-served schools, or reading objective information about inequality) can increase people's endorsement of external attributions for inequality (Conn, Lovison, & Mo, 2021; McCall, Burk, Laperrière, & Richeson, 2017; Piff et al., 2020; Shedd, 2015; Wiwad, Mercier, Piff, Shariff, & Aknin, 2020). Firsthand exposure to inequality confronts people with information contrary to the dominant narrative; it demonstrates how forces beyond individuals' control can shape people's opportunities.

Recognizing how inequality can arise from external factors is important because those who endorse these external attributions are more likely to see inequality as undeserved and in need of structural intervention (Kluegel & Smith, 1986; McCall, 2013; Mo & Conn, 2018; Piff et al., 2020; Wiwad et al., 2020). That is, by understanding how features in the environment—history, other people, and social systems—shape and constrain individuals' outcomes, people are more likely to recognize the need for structural policies that promote equality (Kluegel & Smith, 1986). Together, previous research suggests that one critical way to increase people's advocacy for equality is by encouraging people to better recognize the external factors that fuel inequality.

2. Personal harm and advocacy for equality

Given the important relationship between endorsement of external attributions and advocacy for equality, what types of experiences during the pandemic might increase people's endorsement of external attributions for inequality? Previous research has already examined one important factor—i.e., the extent to which the pandemic increases awareness of *other* people's poverty (Wiwad et al., 2020). Here, we focus on a distinct and novel factor that we theorize will also be associated with increased endorsement of external attributions – people's *own* firsthand experiences of personal harm due to a force outside of their control—i.e., the pandemic. We hypothesize that the degree of personal harm people experience due to the Covid-19 pandemic will be associated with an increase in their advocacy for equality over time. We also hypothesize that the relationship between personal harm and increased advocacy for equality will be explained, in part, by people's greater endorsement of external attributions for inequality.

Consistent with these hypotheses, research in cultural psychology and sociology demonstrates that historically lower-power groups (e.g., people in lower social class contexts, racial/ethnic minorities) are more likely to endorse external attributions for inequality and support structural policies that promote equality compared to historically higher-power groups (e.g., people in higher social class contexts, White people; Bob & Kluegel, 1997; Kluegel & Smith, 1986; Kraus, Piff, & Keltner, 2009; Newman, Johnston, & Lown, 2015; Schlesinger & Heldman, 2001). For example, ethnographic research documents that repeatedly experiencing stratification in society (e.g., living in a city with high levels of income inequality) allows young people to recognize how external factors constrain their lives (Shedd, 2015).

Researchers have theorized, but not tested, the idea that one reason for these group differences is that people in lower-power (vs. higher-power) positions have greater firsthand, chronic experiences of adversity or harm, in which they have limited choice, influence, and control (e.g., lack of access to healthcare). These constraints make salient the external forces that limit people's experiences and outcomes more broadly (Kluegel & Smith, 1986). And, as noted above, when people better recognize how external factors constrain outcomes in life, they are more likely support structural policies that promote equality. Building on and extending this prior work, the current research exploits the variation in personal harm due to the onset of the Covid-19 pandemic to examine the proposition that harm predicts an increase in external attributions for inequality and, in turn, greater advocacy for equality.

3. The current research

In our three-wave longitudinal study, we test the theory that experiencing greater personal harm from the COVID-19 pandemic will be associated with greater endorsement of external attributions for inequality, and in turn, greater advocacy for equality. We also make two additional theoretical contributions. First, we extend prior research by providing evidence for a novel antecedent of external attributions for inequality: degree of personal harm from an external, uncontrollable force. Second, we test whether the effect of personal harm on advocacy for equality shapes attitudes over time (i.e., over a full year). We investigate the following three key hypotheses:

1. Experiencing greater amounts of personal harm from the pandemic will be associated with increased advocacy for equality.
2. Experiencing greater amounts of personal harm from the pandemic will be associated with greater endorsement of external attributions for inequality.
3. External attributions for inequality will serve as a mechanism linking personal harm from the pandemic to advocacy for equality.

Our specific hypotheses and analyses were exploratory. However, while we did not pre-register the specific hypotheses we test here, we did pre-register general research questions of interest related to the current investigation, our data collection plan, our exclusion criteria, and the survey questions. The data we draw upon for this research were collected as part of a broader investigation on the effects of the Covid-19 pandemic over time. In the main text of this article, we reference the pre-registration when applicable and report all measures and exclusions relevant to the current research project. We also report the full list of measures in the broader study as well as our transparency checklist on OSF (Aczel et al., 2019; https://bit.ly/3hcWRMr).

4. Methods

4.1. Participants

In May 2020 (Time 1), we recruited participants via Prolific Academic, an online survey platform, to participate in a 25-min study in exchange for $3.50. In October 2020 (Time 2), we invited all participants from the Time 1 survey who indicated interest in future studies to complete a second 25-min study in exchange for $4.50. In May 2021 (Time 3), we invited all participants from the Time 1 survey who indicated interest in taking future studies to complete another 40-min study in exchange for $6.

These three surveys were part of a larger study of the effects of the Covid-19 pandemic over time. We recruited U.S. citizens between the ages 18–70 who were not currently students. Furthermore, we recruited a balanced sample in terms of gender and education level (i.e., those with less than a four-year college degree vs. those with a four-year degree or more). We recruited a sample that was balanced by gender and education level for purposes of other studies that were part of this broader investigation of the effects of the pandemic over time. Per our pre-registration, in our final dataset, we excluded participants who, at any point in the three surveys, were not U.S. citizens, were students, and/or were inattentive responders.

Applying this pre-registered exclusion criteria, at Time 1 (T1), our usable sample was $N = 1395$. At Time 2 (T2), our usable sample was $N = 987$ (71% retention of T1). At Time 3 (T3), our usable sample was $N = 751$ (54% retention of T1). Our longitudinal analyses utilized data from all three survey waves. As such, when looking at complete responses for participants who finished all three waves of our study and met all pre-registered inclusion criteria, we were left with a usable sample of $N = 688$ (i.e., 49% of the T1 sample). Due to the high degree of missingness in the complete, usable dataset, we next examined attrition rates and best practices for handling missing data.

4.2. Attrition and missing data

Participants who completed all three waves of the survey (vs. those who did not) differed significantly in terms of personal harm, as well as in terms of income, age, gender, and race. Specifically, participants who completed all three waves of the survey reported lower levels of personal harm ($M = 1.92$, $SD = 1.96$) than those who did not complete all three waves ($M = 2.26$, $SD = 2.32$). Those who completed all three waves were more likely to have lower personal incomes, be older, be women, and be White (see Supplemental Materials Section XI).

Given that our missing data were conditionally dependent on our observed variables, our data was best characterized as *missing completely at random conditional on observed covariates* (MCAR|X), also called *missing at random* (MAR; Cheema, 2014; Gomila & Clark, 2020; Nissen, Donatello & Van Dusen, 2019). This missingness can unduly bias results because the data is skewed in representation toward, for example, those who experienced less personal harm, as is the case in our data. This skew increases the likelihood of bias in our analyses and as such, best practices currently recommend imputation of the missing data to debias results (Nissen, Donatello & Van Dusen, 2019). Therefore, we imputed our missing data using multiple imputation with the *mice* package in R, following current best practices (van Buuren, 2021). However, results are largely equivalent with the smaller, non-imputed sample. In two instances, though the patterns were in the same direction as the results presented in the main text, analyses did not reach conventional levels of significance (see Supplemental Materials Section III).

The final imputed sample consisted of 704 women, 688 men, and three gender non-conforming individuals ($M_{age} = 38.40$ years, $SD = 12.70$). People with less than a 4-year college degree comprised 51% of the sample. The sample was 8% Black, 8% Asian, 4% Latinx, 71% White, <1% Native, <1% Arab, 1% unspecified racial identity and 7% multiracial. The Institutional Review Board reviewed and approved the study before data collection (protocol: 53892). A post-hoc sensitivity analysis indicated we were 90% powered to detect a small effect of $f^2 = 0.015$. The data are available at https://bit.ly/3hcWRMr.

4.3. Measures

A full list of items for each measure in all waves of the survey can be found in the Supplemental Materials Section I.

4.3.1. Personal harm from Covid-19

We asked participants whether they experienced several indicators of personal harm resulting from the Covid-19 pandemic. Drawing on previous psychological methods used to study adverse life experiences (Croft, Dunn, & Quoidbach, 2014; Felitti et al., 1998; Seery, Holman, & Silver, 2010), these items were designed to capture a range of forms of personal harm that people may have experienced during the pandemic. Also consistent with previous research on adversity, we assessed personal harm indicators via retrospective yes/no questions (Breslau, Troost, Bohnert, & Luo, 2012; Bromet et al., 2017; McLaughlin, Conron, Koenen, & Gilman, 2010). At T1, we asked participants to reflect on whether they experienced any of 14 indicators of personal harm since the Covid-19 pandemic began. Sample items include: "I contracted Covid-19", "I experienced an episode of poor mental health or mental illness" and "I experienced significant financial difficulties." Consistent with previous research (Seery et al., 2010), we summed the number of items for which respondents answered "yes" at each time point to represent the overall degree of personal harm people experienced from the Covid-19 pandemic. At T1, 70.2% of the sample reported experiencing at least one form of personal harm since the pandemic began. To contextualize which indicators of personal harm were most common in our sample, we present the prevalence of each item of the personal harm checklist at T1 in Fig. 1 (i.e., % of sample that checked "yes" for each indicator).

These results reveal that at least some participants in our sample experienced physical, financial, and psychological indicators of harm. As such, following previous research on life adversity which has documented that one form of adversity often has spillover effects on other types of adversity (Green et al., 2010; McMahon, 2015), here, we focused on the overall personal harm (i.e., physical, financial, and psychological) people experienced. Experiencing each of these forms of harm can make salient the way that forces beyond one's control can shape life outcomes. Summed responses to this checklist best enabled us to capture each participant's global personal harm from the Covid-19 pandemic.

4.3.2. Advocacy for equality

Across the three waves, we included both attitudinal and behavioral measures of advocacy for equality. The measure of attitudinal advocacy for equality was included in all three waves of the survey. However, the behavioral measure of advocacy for equality was added in the second wave. In our analyses, we conducted separate regression models: one with attitudinal advocacy for equality as the dependent measure, and the other with behavioral advocacy for equality as the dependent measure. Doing so enabled us to determine whether personal harm predicts these two distinct forms of advocacy for equality.

In addition to these two measures, all three waves of the survey included other attitudinal measures related to advocacy for equality (e.g., preference for a more equal distribution of wealth, increased salary for low wage workers, awareness of inequality etc.). Though these measures showed largely equivalent patterns of results to the advocacy measures reported in the main text, to reduce redundancy, we report these measures and results in the Supplemental Materials Section II.

Advocacy for Equality: Attitudes. To assess participants' attitudinal advocacy for equality, we asked participants to respond to items adapted from previous research (Piff et al., 2020) on a scale from 1 (*strongly disagree)* to 7 (*strongly agree*). At T1, participants responded to the

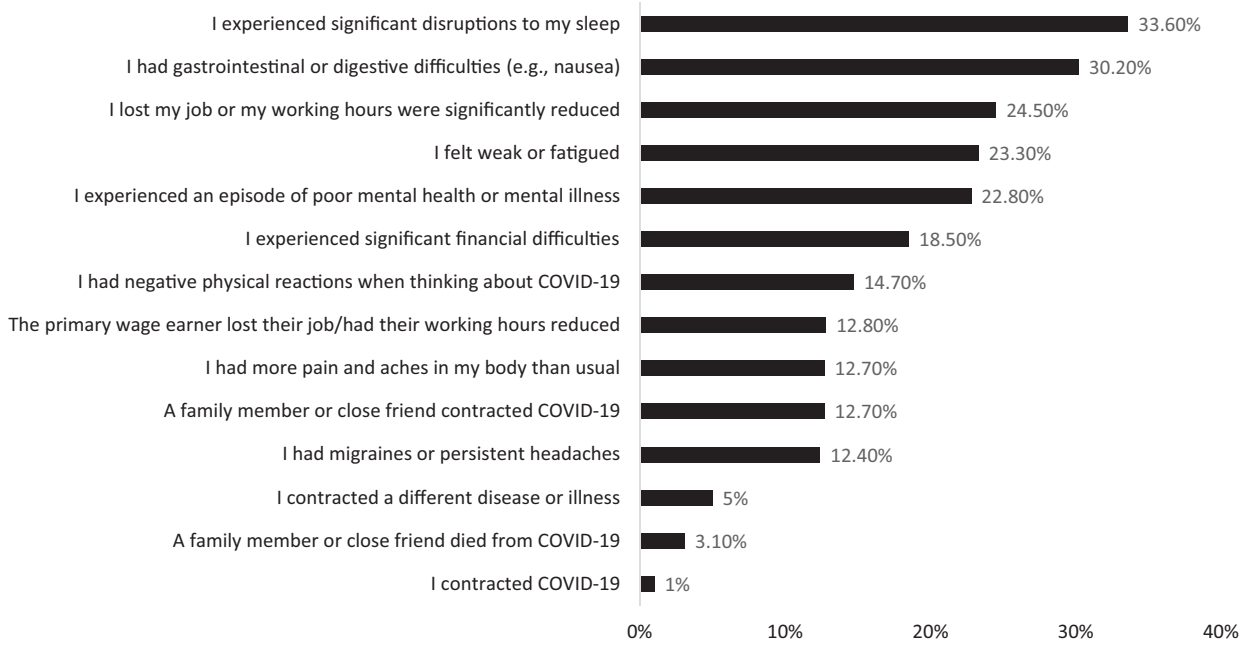

Fig. 1. Prevalence of each item of the personal harm checklist at T1 (i.e., % of sample that checked "yes" for each indicator).

following three items: "The minimum wage in the US should be increased"; "There should be universal basic income"; and "There should be universal healthcare" ($M = 5.54$, $SD = 1.64$; $\alpha = 0.88$).

At T2 and T3, participants responded to the exact same items from T1 and an additional four items to capture a broader range of their attitudes toward advocacy for equality: "The government should provide stimulus checks to help people meet their basic needs"; "The government should provide support for peoples' welfare during hard times"; "Covid-19 testing should be available at no cost to anyone who wants to get tested" and "Covid-19 treatment should be free." The seven-item measure was highly reliable (T2: $M = 5.85$, $SD = 1.21$; $\alpha = 0.91$; T3: $M = 5.83$, $SD = 1.22$; $\alpha = 0.91$).[1]

Advocacy for Equality: Behavior. To assess participants' behavioral advocacy for equality, we asked participants at T2 and T3 to reflect on whether they had engaged in any of the following behaviors: "Contacted a public official to express support for reducing social or economic inequality"; "Contributed money to a group or organization that focuses on reducing social or economic inequality"; or "Posted or shared content on social networking sites related to reducing social or economic inequality." We counted each item participants marked as 1 and each unmarked item as 0. We totaled the number of items marked to represent the amount of action they took to advocate for greater equality (T2: $M = 0.61$, $SD = 0.75$; T3: $M = 0.39$, $SD = 0.66$).

4.3.3. External attributions for inequality

To assess attributions for inequality, in all three waves of the survey, we asked participants "How much do you think that economic inequality is due to the following factors?" (Cozzarelli et al., 2001; Kraus et al., 2009; Piff et al., 2020). Participants were asked to read a list of possible factors and indicate to what extent these factors played a role in inequality using a scale from 1 (*not at all*) to 5 (*a great deal*). To capture participants' *external attributions for inequality*—our hypothesized mediator—we averaged the following two items, which reflect a shortened scale adapted from previous research examining attributions for inequality (e.g., Cozzarelli et al., 2001; Kraus et al., 2009; Piff et al., 2020). One item reflected the locus dimension of external attributions (Piff et al., 2020): "situational and environmental factors (e.g., quality of schools, job opportunities)." The second item reflected the control dimension of external attributions (Piff et al., 2020): "discrimination (e.g., prejudice and bias)," (T1: $M = 3.61$, $SD = 0.99$, $r = 53$; T2: $M = 3.69$, $SD = 0.92$; T3: $M = 3.70$, $SD = 0.93$, $r = 50$). Both attributions place the blame (and responsibility) for inequality on external, situational factors (Piff et al., 2020).

Our attribution measure also included two items that represent participants' internal attributions for inequality. One item reflected the locus dimension of internal attributions (Piff et al., 2020): "genetics and biology (e.g., innate differences in intelligence)." The second item reflected the control dimension of internal attributions (Piff et al., 2020): "differences in individual work ethic" (T1: $M = 2.51$, $SD = 1.02$; T2: $M = 2.44$, $SD = 0.95$; T3: $M = 2.40$, $SD = 0.85$). These attributions place the blame (and responsibility) for inequality on internal, individual-level factors (Piff et al., 2020). Analyses showed that personal harm did not influence internal attributions. As such, for the sake of concision, we do not discuss this variable further and report results only in the supplemental material (see Supplemental Materials Section IX).

4.4. Control variables

In all three waves, we collected several control variables, including those that help us control for more chronic harm not directly due to the Covid-19 pandemic (i.e., age, gender, race/ethnicity, personal income, education level; Acker, 2016; Adler & Rehkopf, 2008; Crear-Perry et al., 2021; Gharehgozli & Atal, 2020; Oishi, Kesebir, & Diener, 2011; Shah, Mullainathan, & Shafir, 2012; Zavala et al., 2020) as well as participants' political orientation, which has been previously shown to relate to attitudes toward equality (Wiwad et al., 2020). In the Analytic Approach section below, we explain in greater depth our rationale for why these control variables can help us isolate the effect of harm due to

[1] When only including the three original T1 items, the pattern of results is in the same direction, but does not reach statistical significance (see Supplemental Materials Section V).

the pandemic over and above other types of chronic harm and political orientation.

4.4.1. Age

Participants indicated their age in years ($M = 38.40$, $SD = 12.70$).

4.4.2. Gender

Participants indicated their gender identity as female, male, or non-binary/other. Given that the non-binary sample was too small ($n = 3$) to control for as a separate category, we only controlled for whether participants' gender was male or female.

4.4.3. Race/ethnicity

Participants checked all races and ethnicities that applied to them from the following list: African American or Black, Asian/Asian American, Hispanic/Latino, White/Caucasian, Native American, Arab/Middle Eastern, and Other. Participants who only selected one race or ethnicity were coded with the single race or ethnicity they checked, and participants who selected more than one race or ethnicity were coded as multiracial. Consistent with previous research (Fairlie, 2020; Kantamneni, 2020; Tessler, Choi, & Kao, 2020; Webb Hopper, Nápoles, & Pérez-Stable, 2020) on how the Covid-19 pandemic has differentially affected racial/ethnic minorities (e.g., disproportionate losses among racial/ethnic minority-owned businesses compared to White-owned businesses) we controlled for participant race using a binary White (i.e., monoracial White individuals, coded 1; 71.3%) vs. racial/ethnic minorities (i.e., all non-White, including multiracial, individuals coded 0; 28.7%) measure.

4.4.4. Political orientation

Participants indicated their political orientation on a scale from 1 (*very liberal*) to 7 (*very conservative*; $M = 3.23$, $SD = 1.63$).

4.4.5. Personal income

Participants reported their current annual personal income on an 8-point scale: 1 = $9999 or less; 2 = $10,000–$19,999; 3 = $20,00–$29,999; 4 = $30,00–$49,900; 5 = $50,000–$74,999; 6 = $75,000–$99,999; 7 = $100,000–$200,000; or 8 = greater than $200,000 ($M = 3.48$, $SD = 1.86$). If recently unemployed due to the pandemic, participants reported their personal income prior to unemployment. This variable was meant to capture participants' typical number of resources before the pandemic, and in the case of the unemployed particiants, was used as a substitute for the current personal income variable.

We used this variable as a substitute for the current personal income variable for two reasons. First, methodologically, we did not want participants who recently became unemployed due to the pandemic (i.e., who had recently dropped to zero income) to skew the income variable. Second, theoretically, we did not want to include a control variable that captured financial harm during the pandemic (i.e., a current income of zero due to job loss), because our measure of personal harm captures participants' experiences of financial harm during the pandemic (e.g., losing a job).

4.4.6. Education level

Participants reported the highest level of education they had completed on a 6-point scale: 1 = Some high school or less, 2 = High school diploma, 3 = Some college (1 year to <4 years), 4 = Two-year college degree (A.A.), 5 = Four-year college degree (B.A. or B.S.), 6 = MA/PhD, MD, MBA, Law Degree. Education was used as a continuous variable in our analyses ($M = 4.08$, $SD = 1.37$).

5. Analytic approach

We conducted two separate sets of analyses to test our hypotheses: lagged and cross-lagged. First, we conducted lagged analyses to test our theorized temporal ordering of the process by which personal harm predicts advocacy for equality through external attributions. Second, we conducted cross-lagged analyses to test more precisely whether personal harm *causally* influenced people's attitudes, rather than the reverse causal ordering (Selig & Little, 2012). In both sets of analyses, we included our standard set of control variables.

5.1. Lagged analyses

By conducting lagged analyses, we were able to examine the temporal ordering of our measures and theorizing about the process through which personal harm affects advocacy for equality (i.e., our hypothesized mediation model). To do so, we drew our predictor (i.e., personal harm) from T1 (May 2020), our mediator variable (i.e., external attributions) from T2 (October 2020), and our outcome variables (i.e., advocacy for equality) from T3 (May 2021). Fig. 2 provides a conceptual illustration of the timeline of our study and the period at which each of our key variables were measured.

In these analyses, we include two key sets of control variables. First, we control for demographic differences that serve as proxies for chronic harm (i.e., life adversity in general that is not specific to the Covid-19 pandemic). That is, to ensure that our analyses capture effects of personal harm from the Covid-19 pandemic above and beyond chronic harm due to demographic differences, we control for the following proxies of chronic harm: personal income, education, age, race/ethnicity, and gender.[2] All of these have previously been shown to be associated with experiencing greater personal hardship in general (Acker, 2006; Oishi et al., 2011; Shah et al., 2012; Soss, Fording & Schram, 2011; Volpe, Dawson, Rahal, Wiley & Vesslee, 2019).[3] We also control for political orientation, which has been previously shown to relate to attitudes toward equality during the pandemic (Wiwad et al., 2020). Throughout our analyses, we refer to these as our "standard set of control variables."

Second, we control for participants' "baseline" attitudes measured at Time 1 such as external attributions for inequality and advocacy for equality. By controlling for these baseline beliefs and thereby conducting this lagged analysis, we can better demonstrate that personal harm predicts a *change* in attitudes over time (Emery & Finkel, 2022; Schonfeld, Brailovskaia et al., 2018).[4] We included these controls in our analyses to ensure that our results were robust to their inclusion. However, results without these control variables showed similar but stronger patterns (see the Supplemental Materials Section IV).

To test our first hypothesis (H1) that experiencing greater amounts of personal harm from the pandemic in its earliest months will be associated with increased advocacy for equality one year later, we conducted two separate lagged regressions. First, we regressed attitudinal advocacy for equality (measured at T3) on personal harm (measured at T1). In this

[2] We also examined whether these demographic differences predicted our outcomes of interest. We found that income, race/ethnicity, education, and age predicted participants' advocacy for equality and external attributions for inequality in some cases but not in others (see Supplemental Materials Section XII).

[3] In the Supplemental Materials Section VIII we examine whether our results are moderated by any of these individual differences that are associated with experiencing general harm or life adversity (e.g., Haney-López, 2014; Hochschild, 2018; Lamont et al., 2017). Though a large body of research documents social group differences in attributions and advocacy for equality, there was no evidence of moderation by demographic group in our data. It is possible we did not find moderation by social group membership because people experienced personal harm from an entirely new external factor (i.e., the Covid-19 pandemic). This novel personal experience with a clearly external force may crowd out other group-based factors that have previously been shown to predict advocacy for equality.

[4] We also report how harm at each time point predicts advocacy for equality at the corresponding time point (see Supplemental Materials Section VI and VII). Results are significant for all of these analyses.

Fig. 2. Timeline of key measures.

analysis, we included our standard set of control variables (described above) as well as T1 attitudinal advocacy for equality to better represent the causal consequences of personal harm on advocacy for equality. Second, we regressed behavioral advocacy for equality (measured at T3) on personal harm (measured at T1). In this analysis we included our standard set of control variables (described above). We could not control for T1 behavioral advocacy for equality because we did not include this measure in the survey at T1.

To test our second hypothesis (H2) that experiencing greater amounts of personal harm will be associated with greater endorsement of external attributions for inequality, we regressed external attributions for inequality (measured at T2) on personal harm (measured at T1). We again included the standard set of controls as well as T1 external attributions for inequality to represent the causal effect of personal harm.

Finally, to test our third hypothesis (H3) that greater amounts of personal harm will predict greater advocacy for equality via increased external attributions for inequality, we conducted two separate mediation analyses with 10,000 bootstrapped samples: one on *attitudinal* and one on *behavioral* advocacy for equality. We utilized participants' external attributions for inequality (measured at T2) as the mediator linking personal harm from the Covid-19 pandemic (measured at T1) to attitudinal and behavioral advocacy for equality outcome variables (measured at T3) and included our standard set of controls. When examining attitudinal advocacy for equality, we controlled for T1 attitudinal advocacy for equality, T1 external attributions for inequality, and our standard set of control variables. When examining behavioral advocacy for equality, we could not control for T1 behavioral advocacy for equality because we did not include this measure in the survey at T1. However, we controlled for T1 external attributions for inequality and our standard set of control variables.

5.2. Cross-lagged analyses

With cross-lagged structural equation models (CLPM; Selig & Little, 2012), we examined whether personal harm from the Covid-19 pandemic was a cause rather than an effect of advocacy for equality and external attributions for inequality over the year. We used the *lavaan* package in R (Rosseel, 2012). CLPM models also allow for the inclusion of time-invariant and time-varying covariates (i.e., our standard set of covariates, some of which do not have varying effects from timepoint to timepoint—e.g., age, gender, race, education level, and income, and some of which do have varying effects—e.g., politcal orientation; Mund, Johnson, & Nestler, 2021).

We were only able to conduct cross-lagged analyses on attitudinal advocacy for equality because attitudinal advocacy was the only downstream measure of advocacy for equality included at all three timepoints. First, we examined the relationship between personal harm (T1 and T3) and attitudinal advocacy for equality (T1 and T3), as both possible causes and effects of one another, over the one-year period. Second, we examined the relationship between personal harm (T1 and T2) and external attributions for inequality (T1 and T2), as both possible causes and effects of one another, over a five-month period. Finally, we combine this into an overall cross-lagged mediation model testing our full theorized model from personal harm (T1) to external attributions (T2) to attitudinal advocacy for equality (T3). These cross-lagged analyses allow for substantially greater confidence in drawing causal conclusions (Selig & Little, 2012).

6. Results

6.1. Lagged analyses

6.1.1. Advocacy for equality

Supporting Hypothesis 1 and as shown in Table 1, we found that experiencing greater personal harm from the pandemic was associated with increased advocacy for equality one year later. Specifically, personal harm at T1 predicted an increase in attitudinal advocacy for equality at T3. Personal harm at T1 also predicted behavioral advocacy for equality at T3.

6.1.2. External attributions for inequality

Supporting Hypothesis 2 and as detailed in Table 1, we found that experiencing greater personal harm at T1 was associated with greater endorsement of external attributions for inequality five months later (i.e., at T2).

6.1.3. Mediation

Supporting Hypothesis 3 and as shown in Fig. 3, we found that external attributions for inequality at T2 mediated the relationship between personal harm at T1 and advocacy for equality for both attitudinal and behavioral measures at T3: attitudinal advocacy for equality ($B = 0.005$, $SE = 0.002$, 95% CI = [0.001, 0.01] and behavioral advocacy for equality ($B = 0.002$, $SE = 0.001$, 95% CI = [0.001, 0.005]. The 95% CIs did not include zero, suggesting that the indirect effects of personal harm on advocacy for equality through external attributions were significant. Even considering the limitations of correlational indirect effects analyses (Fiedler, Harris, & Schott, 2018), these results suggest that personal harm from the Covid-19 pandemic was associated with increased advocacy for equality one year later, in part, because personal harm was associated with greater endorsement of external attributions for inequality five months later. Moreover, the longitudinal nature of these measures provides fairly strong evidence of the causal ordering of these indirect effects.

6.2. Cross-lagged analyses

6.2.1. Attitudinal advocacy for equality

Our cross-lagged analysis of the relationship between personal harm from the Covid-19 pandemic and attitudinal advocacy for equality gave a reasonably good fit to the empirical data (CFI = 0.99, RMSEA = 0.053, SRMR = 0.018). As shown in Fig. 4a, personal harm from the Covid-19 pandemic at Time 1 predicted attitudinal advocacy for equality at Time 3 ($\gamma_{21} = 0.02$, $p = 0.032$). In contrast, the reciprocal pathway from attitudinal advocacy for equality at Time 1 to personal harm at Time 3 was not statistically significant ($\gamma_{12} = 0.05$, $p = 0.153$).

Table 1
Regression results for attitudinal advocacy for equality, behavioral advocacy for equality and external attributions for inequality.

	Attitudinal advocacy for equality at T3					Behavioral advocacy for equality at T3					External attributions for inequality at T2				
	B	*se*	*t*	*p*	95% CI	*B*	*se*	*t*	*p*	95% CI	*B*	*se*	*t*	*p*	95% CI
Personal harm at T1	0.02	0.01	2.29	0.02	0.00, 0.03	0.03	0.09	4.09	<0.001	0.02, 0.05	0.02	0.01	2.50	0.01	0.00, 0.04
Age	0.00	0.00	1.37	0.17	−0.00, 0.00	0.00	0.00	2.61	0.01	0.00, 0.01	0.00	0.00	2.57	0.01	0.00, 0.01
Gender	−0.02	0.03	−0.64	0.52	−0.09, 0.05	0.01	0.03	0.16	0.87	−0.06, 0.07	−0.01	0.04	−0.14	0.89	−0.08, 0.07
Race/Ethnicity	−0.08	0.04	−2.04	0.04	−0.15, −0.00	−0.02	0.04	−0.49	0.62	−0.09, 0.05	−0.14	0.04	−3.66	<0.001	−0.22, −0.07
Political orientation	−0.12	0.01	−9.21	<0.001	−0.15, −0.10	−0.16	0.01	−15.65	<0.001	−0.18, −0.14	−0.18	0.01	−14.99	<0.001	−0.21, −0.16
Personal Income	−0.03	0.01	−2.65	0.01	−0.05, −0.01	0.01	0.01	1.33	0.19	−0.01, 0.03	0.00	0.01	0.13	0.90	−0.02, 0.02
Education Level	−0.02	0.01	−1.42	0.16	−0.04, −0.01	0.04	0.01	2.72	0.01	0.01, 0.06	0.02	0.01	1.77	0.08	−0.00, 0.05
Baseline attitude at T1	0.55	0.01	42.21	<0.001	0.53, 0.58	–	–	–	–	–	0.45	0.02	22.31	<0.001	0.41, 0.49

Note. Baseline attitudes reflect the baseline attitude of the central dependent variable in each regression. Given that we did not measure behavioral advocacy for equality at T1, this regression does not include a baseline attitude.

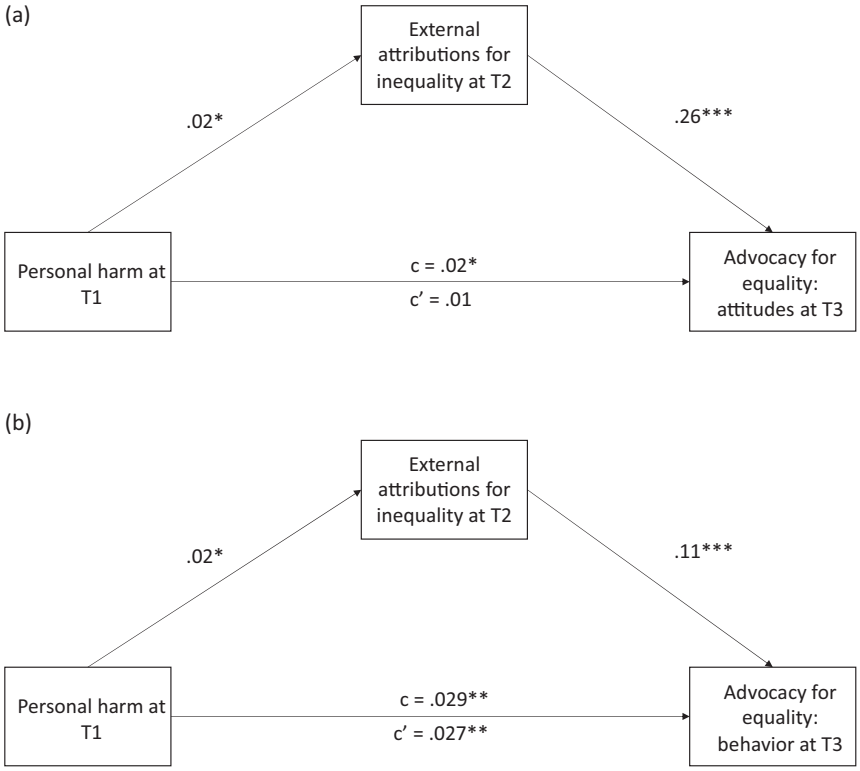

Fig. 3. a. Mediation model for advocacy for equality attitudes at T3.
Note. We used the PROCESS macro in SPSS (Hayes, 2017) to test our indirect effects model with 10,000 bootstrapped samples. This analysis control for individual differences (personal income, education, age, race/ethnicity, gender, and political orientation) as well as participants' "baseline" level of external attributions for inequality for path x to m and "baseline" level of attitudinal advocacy for equality for path m to y.
b. Mediation model for advocacy for equality behavior at T3.
Note. We used the PROCESS macro in SPSS (Hayes, 2017) to test our indirect effects model with 10,000 bootstrapped samples. This analysis control for individual differences (personal income, education, age, race/ethnicity, gender, and political orientation) as well as participants' "baseline" level of external attributions for inequality for path x to m. We cannot control for participants "baseline" level of behavioral advocacy for equality because we did not measure it at Time 1.

6.2.2. *External attributions for inequality*

Our cross-lagged analysis of the relationship between personal harm from the Covid-19 pandemic and external attributions for inequality also gave a good fit to the empirical data (CFI = 0.99, RMSEA = 0.037, SRMR = 0.017). As shown in Fig. 4b, personal harm from the Covid-19 pandemic at Time 1 predicted external attributions for inequality at Time 2 ($\gamma_{21} = 0.02$, $p = 0.034$). The reciprocal pathway from external attributions at Time 1 to personal harm at Time 2 was not statistically significant ($\gamma_{12} = -0.06$, $p = 0.156$).

6.2.3. *Mediation*

Our cross-lagged analysis of the mediation model linking personal harm from the Covid-19 pandemic to attitudinal advocacy for equality via external attributions for inequality also gave a reasonably good fit to the empirical data (CFI = 0.97, RMSEA = 0.085, SRMR = 0.031). First, there was a trending but nonsignificant effect of personal harm from the Covid-19 pandemic at Time 1 on external attributions for inequality at Time 2 ($\gamma_{21} = 0.02$, $p = 0.051$). The reciprocal pathway from external attributions at Time 1 to personal harm at Time 2 was not statistically significant ($\gamma_{12} = 0.008$, $p = 0.878$). Next, external attributions at Time 2 predicted attitudinal advocacy for equality at Time 3 ($\gamma_{32} = 0.07$, $p < 0.001$). The reciprocal pathway from attitudinal advocacy for equality at Time 2 to external attributions at Time 3 was also statistically significant ($\gamma_{23} = 0.30$, $p < 0.001$). This suggests that there may be reciprocal effects between external attributions and advocacy for equality. Indeed, we also found that personal harm from the Covid-19 pandemic at Time 1 significantly predicted attitudinal advocacy for equality at Time 2 ($\gamma_{22} = 0.02$, $p = 0.039$; see Fig. 5 for details).

These results suggest that personal harm from the Covid-19 pandemic was associated with greater endorsement of external attributions for inequality five months later. External attributions, in turn, were associated with greater attitudinal advocacy for equality one year later. However, we also obtained evidence that personal harm was associated with greater attitudinal advocacy for equality five months later, which in turn, was associated with greater endorsement of external attributions for inequality one year later. The cross-lagged nature of these measures provides fairly strong evidence of the causal effect of personal harm at the beginning of the pandemic on subsequent attitudes toward inequality. However, the path through which harm changes attitudes is less clear. External attributions and advocacy for

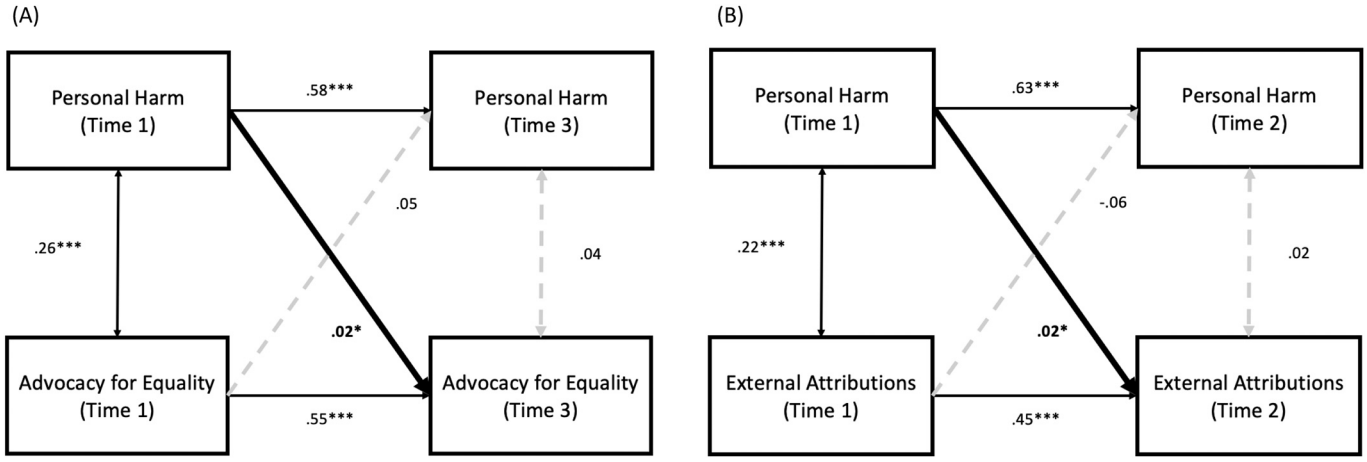

Fig. 4. a-b (A) Cross-lagged model linking personal harm at Time 1 to advocacy for equality at Time 3. (B) Cross-lagged model linking personal harm at Time 1 to external attributions at Time 2.
Note. Parentheses represent 95% confidence intervals. + $p < 0.10$. * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

equality are highly interrelated constructs, and may have been shifting simultaneously (as opposed to in succession, as we theorized initially).

7. Discussion

Though the Covid-19 pandemic was not the "great equalizer" it was predicted to be, might it nonetheless have influenced Americans' attitudes and behaviors toward equality? While many have had firsthand experiences with personal harm resulting from the pandemic, this has not been the case for all Americans. Some have continued to go about day-to-day life as normal and remained relatively unharmed. Here, we examined whether personal harm from the pandemic related to people's attitudes and behaviors toward equality. The results of our three-wave longitudinal study suggest that experiences of personal harm in the earliest days of the pandemic were associated with increased attitudinal and behavioral advocacy for equality one year later. Moreover, five months after experiencing personal harm, Americans' greater endorsement of the external drivers of inequality served as a mechanism helping to explain the link between personal harm and increased advocacy for equality one year later.

Our research makes several important theoretical contributions. First, our research provides empirical evidence for a novel antecedent to both Americans' understanding of the sources of inequality and their willingness to advocate for equality: personal harm from an external force—in this case, the Covid-19 pandemic. Documenting this novel antecedent helps reconcile previous disparate findings on whether those who experience adversity will be more or less likely to advocate for greater equality. On the one hand, previous research suggests that lower- (vs. higher-) power groups should be more likely to advocate for inequality because they are exposed to more chronic harm and therefore are especially likely to endorse external attributions (Kraus et al., 2009). On the other hand, previous research has also found that lower- (vs. higher-) power groups are often motivated to justify and maintain the current system (e.g., to reduce uncertainty and threat), rather than advocating for greater equality (Cramer, 2016; Godfrey & Wolf, 2016; Haney-López, 2014; Hochschild, 2018; Jost, 2017; Jost & Hunyady,

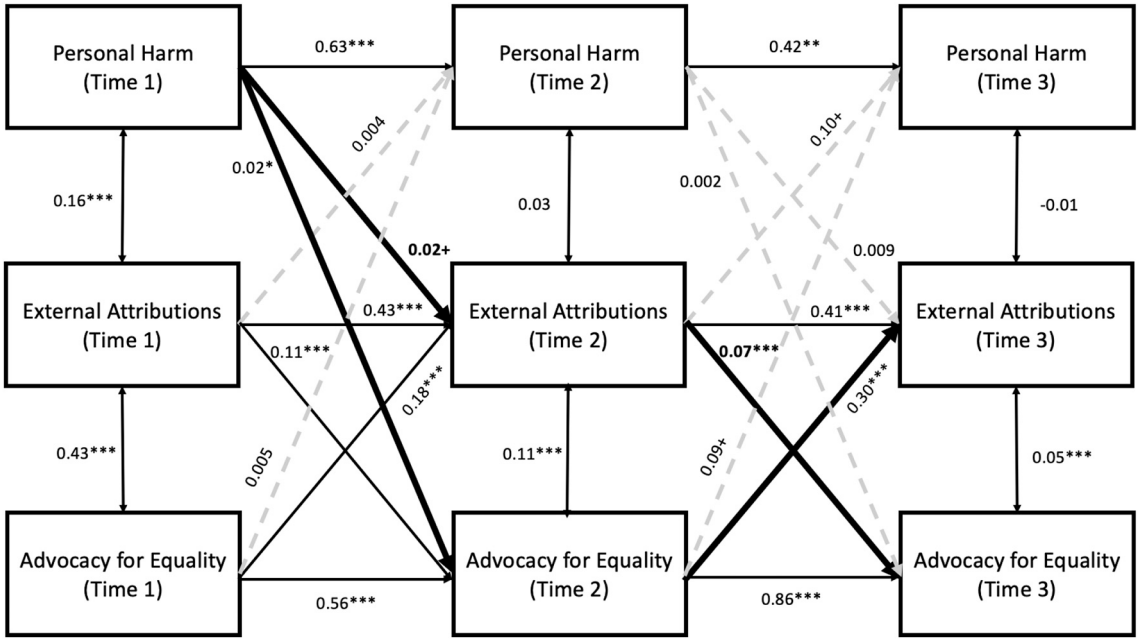

Fig. 5. Cross-lagged mediation model.

2016; Lamont, Park, & Ayala-Hurtado, 2017; McCall, 2013).

We are able to help reconcile these disparate findings by empirically demonstrating that gaining firsthand experience with a *new* social, economic, or health arrangement does not increase people's justification with their current experiences as fair and legitimate. Instead, it predicts people's endorsement of external attributions and relates to their advocacy for greater equality. The work we present here documents that firsthand harm from an external source reflects a situation where people may be more likely to advocate for equality, rather than justifying the current system.

Second, our work demonstrates that personal harm affects people's attitudes and behavior long after the initial harm was experienced – i.e., for a span of at least one year. Specifically, in the first months of the pandemic, experiencing more personal harm predicted people's attitudes toward and advocacy for equality one year later. This suggests that the effects of an external large-scale shock may be relatively long-lasting, laying the groundwork for future larger-scale efforts to promote equality in the U.S.

Finally, our research delineates one specific pathway – *degree* of personal harm – through which large-scale negative events can predict attitudes toward and advocacy for equality. Indeed, our research suggests that merely observing the pandemic from afar is not sufficient to increase people's advocacy for equality; people must be personally impacted. Indeed, 30% of our sample did not report experiencing *any* type of personal harm arising from the pandemic prior to the Time 1 survey (May 2020), and as such, did not meaningfully predict an increase in their attitudes toward and advocacy for equality. This underlines the importance of intervening to help people make connections between exogenous events like the pandemic and how external forces contribute to inequality—regardless of whether they have been personally impacted. Our findings also help shed light on one key reason why other large-scale negative events (e.g., natural disasters) may not influence people's attitudes or produce broad culture change – if they feel personally unaffected by them (Bergquist, Nilsson, & Schultz, 2019; Ray, Hughes, Konisky, & Kaylor, 2017).

Despite these important contributions, we note several limitations and outstanding questions for future research. First, we only surveyed individuals after the pandemic began. Therefore, we cannot definitively demonstrate whether there was a shift in participants' attitudes from *prior* to the pandemic to *during* the pandemic. However, our lagged analyses begin to demonstrate change by controlling for participants' baseline attitudes at Time 1. Indeed, we find that we can control for people's "baseline" attitudes at the start of the pandemic and find significant effects of personal harm on attitudes a year later. Nevertheless, these lagged analyses are limited because they cannot definitively demonstrate causality—they only support the temporal ordering of associations between variables.

We also attempted to better test for causality by conducting cross-lagged analyses, which provide greater confidence that people's attitudes were *driven* by their experiences with personal harm (rather than the reverse). These analyses generally provided support for our predicted causal pathways, such that personal harm from Covid-19 at Time 1 predicted external attributions for equality at Time 2 and attitudinal advocacy for equality at Time 3 (and the reverse pathways were not significant; see Figs. 4a-b). However, in a cross-lagged mediation analysis, there were reciprocal relationships between external attributions and attitudinal advocacy for equality at Times 2 and 3. Therefore, while we have more evidence for the link between personal harm at Time 1 and attitudes toward inequality (i.e., both external attributions and attitudinal advocacy for equality) we cannot definitively claim that external attributions exclusively lead to advocacy for equality, but not vice versa.

While our cross-lagged analyses generally provide support for the influence of personal harm on advocacy for equality over time, they also reveal that there may be reciprocal effects between people's external attributions and their attitudinal advocacy for equality. Taken together, our analyses suggest that the causal effects of personal harm from the Covid-19 pandemic on people's attitudes toward equality are consistent with our theorizing but not definitive. Future research should seek to replicate these findings to more systematically understand the process through which people's attitudes toward inequality change. For example, though following prior work, we theorized that external attributions would be the process through which people came to be more supportive of policies advocating for greater equality, our cross-lagged results suggest these two attitudes may have been changing simultaneously and exerting reciprocal influence on each other. In light of these findings, future interventions might consider whether to focus more on changing people's support for policies that advocate for greater equality directly without first seeking to change their general attributions for inequality.

Second, while we have some evidence that initial harm from the Covid-19 pandemic predicted attitudes a year later, the pandemic was still ongoing when we collected the Time 3 survey. It remains unclear whether the effects will endure when the personal harms endured due to the pandemic have lessened. To better understand the endurance of our effects, future research should examine even longer-term effects and whether they will persist beyond the pandemic itself.

Finally, our work examined attitudes about inequality with a relatively large sample of over 1000 U.S. participants. Despite this large sample, there are at least three limitations. First, this sample was only conducted with U.S. participants and therefore we cannot comment on the experience of the Covid-19 pandemic on populations beyond the U.S. It may be that personal harm does not predict advocacy for equality when people live in cultures that are already more likely to endorse external attributions for outcomes in life (e.g., in East Asia). Furthermore, it is likely that what counts as personal harm will be quite different in countries with less access to resources. Along with other research questions, it is important to consider how our findings may be different in various parts of the world.

Second, we used an online convenience sample that differed from the U.S. population. Specifically, we had a slightly higher representation of racial/ethnic minorities (e.g., 29% of our sample were racial/ethnic minorities compared to 23.7% of population), a higher representation of college educated participants (e.g., 49% of our sample were college education compared to 33% of population), and more liberal participants (56% identified on the liberal side of our scale, 24% were at the midpoint and 21% were on the conservative side of our scale. According to Gallup polls, 25% of Americans described their political views as liberal, 37% of Americans as moderate, and 36% as conservative). Future research should aim to collect a more representative sample to understand the relationship between Covid-19 and attitudes toward equality in the U.S. population as a whole.

Finally, given the challenges of conducting a three-wave longitudinal study during a pandemic, our sample was significantly reduced when we limited our sample to only those participants who finished all three waves and were eligible for the study. To address this data loss, we chose to impute data. As such, these results reflect our best approximation of participants' responses rather than actual self-reported data. Nevertheless, when we conduct analyses with the small sample of only those who completed all three waves, results are equivalent, but weaker. Future research could attempt to recontact a random sampling of participants to reduce attrition and minimize the need for imputation (Gomila & Clark, 2020).

Overall, our research provides one possible silver lining of the Covid-19 pandemic for those who hope to broadly increase advocacy for equality in the U.S. Enduring a large-scale negative event, like a pandemic, has the potential to meaningfully shift people's attitudes toward and advocacy for equality—as long as people experience firsthand harm resulting from this external force. Indeed, the large number of people experiencing personal harm from the pandemic may serve as a critical first step toward building a more equitable U.S. society.

Open practices

In this article, we utilized the following open scientific practices: (a) provided open materials and (b) provided open data. Materials, data, and syntax for analyses are available on the Open Science Framework at the following OSF link: https://bit.ly/3hcWRMr. Links to the preregistration of sampling procedure, survey questions, and methodology are available at the following OSF links:

[Time 1: https://osf.io/amgcq?view_only=b3e8fd0631a34da49d97b0ff4e1ff733;

Time 2: https://osf.io/nv7w8?view_only=523ab3af3e2146139d72f5c329fc42a3;

Time 3: https://osf.io/jvzn9/?view_only=d16c905e9732491bbc2f11360e6478db].

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jesp.2022.104400.

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