Rewarding Valuable Services and Altruistic Motives:

Gratitude and Pay for Essential Workers during the Covid-19 Pandemic

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Abstract

Two studies examine whether a social-cognitive model of appraisal predicts gratitude towards workers deemed “essential” by the UK government during the Covid-19 response. Gratitude was predicted by appraisals of how essential work was, how costly and whether workers were contributing out of a genuine desire to help, and in turn predicted judgments of how much workers should earn. In a second experimental study support is found for the novel prediction that gratitude is systematically higher for lower-paid workers. The data extends the model and applies it to self-reported gratitude towards remote and unidentified workers during a period of crisis.

*Keywords***:** Gratitude, social-cognitive, appraisals, income, Covid-19

Despite being a time of considerable societal crisis, one positive element of the COVID-19 pandemic was a sense of coming together to help out (Carstensen et al., 2021) and widespread public expressions of gratitude, in particular towards frontline healthcare workers (Hurst, 2020). Of specific interest in the current studies was the application of a social-cognitive model of interpersonal gratitude to better understand public responses to frontline workers during the pandemic and to test a key corollary of this model, which is that gratitude would predict judgments of desired monetary reward for these workers. An expanding area of study into prosocial behaviours looks at how observers perceive those who enact prosocial behaviour and the consequences of these perceptions (Berman & Silver, 2022). The studies reported here extend this line of examination beyond perceptions of specific acts of charitable kindness, to perceptions of others on the basis of the kind of work they do during a period of international crisis and how much they should be remunerated for this.

Gratitude and the Covid-19 pandemic

Gratitude is a social emotion that directs our appreciation towards those who have helped us (McCullough et al., 2001). The social role of gratitude has long been recognised: the sociologist Georg Simmel (1950, as cited in McCullough et al., 2001) viewed gratitude as an emotion that links a person to their wider society, that is felt when we receive direct tangible benefits as well as for abstract values, such as inspiration or love, and can be experienced even towards those we have not personally met. Theorists of emotion who view cognitive appraisals as key to eliciting emotional responses have sought to specify the attributions that give rise to gratitude across these distinct social circumstances. For Heider (1958) and Adam Smith (1790/1976) feelings of gratitude arise primarily when people have

benefitted from the actions of someone they believe intended to help them. Not all attribution-dependent models have emphasised the intentionality of the helper, however: Weiner (1985) classified gratitude as an emotion elicited simply when one views their positive circumstances to be the result of the actions of another person.

More recently, Wood and colleagues (2008) developed and tested a social-cognitive model of gratitude appraisals, designed both to formalise gratitude-eliciting attributions and to link trait and state gratitude. Building on work by Tesser et al. (1968), this later model asserts that feelings of gratitude arise according to appraisals made about three aspects of a situation in which a person receives help. These aspects are (a) the value of the help given, (b) the cost to the benefactor of giving help and (c) the intention of the benefactor, specifically, whether they appear to be driven by altruistic intentions to help. Across three studies, Wood et al. (2008) demonstrate that people higher in trait gratitude are more likely to make positive appraisals of this kind, and that these appraisals fully mediate the relationship between dispositional gratitude and reported gratitude in the moment. In one study, appraisals were assessed using a diary method where the participant recorded daily events in which somebody had done something for them and made corresponding evaluations along the three dimensions. In another, vignettes of scenarios in which the participant receives hypothetical help were used to experimentally manipulate the three appraisal dimensions to establish a causal role for these appraisals on state gratitude. These different methods converge to support a model that links the objective situation in which help is given with feelings of gratitude in the moment and the tendency to experience gratitude. Later work shows that these same appraisal dimensions elicit gratitude even when a participant does not directly benefit from the actions of distant hypothetical organisations (Bridger & Wood, 2017).

We were interested in whether the social-cognitive model of gratitude appraisal applies within the social context of the early Covid-19 pandemic. We consider this an open and interesting question for a number of reasons. Firstly, we are not aware of any studies examining perceptions of others on the basis of the kind of work they choose to do and the value of this to society. One key feature of the UK Government's initial response to the Covid-19 crisis in early 2020 presented a unique opportunity to examine this. To establish who would need to send their children to school during the first imposed lockdown, the UK government identified certain categories of work that were deemed to be "essential" to the country's pandemic response (Department for Education, 2020). This included those who worked in at least eight different sectors: health and social care, education, government, food processing and distribution, security, transport, and utilities/services. This category included health care workers working in hospitals on the frontline of the pandemic, who were the targeted recipients of public expressions of gratitude in the form of "clap for carers" (Hurst, 2020) and for whom public gratitude was apparently high. However, this categorisation also included a broader tranche of workers who were less obviously viewed as the face of the pandemic such as food distribution workers and journalists. Our first question of interest was whether the three appraisal dimensions of the social cognitive model would predict gratitude towards essential workers and mediate any association with trait gratitude. Specifically, would reported gratitude be greatest for those workers whose work was deemed to be most valuable, most costly to provide and provided out of a genuine desire to help?

As well as examining for the first time whether these appraisals predict gratitude towards different kinds of work, we were also interested in whether these appraisals apply within the context of a pandemic. Especially during the initial stages, the pandemic was characterised by prolonged periods of uncertainty and anxiety for many people (Robinson & Daly, 2020). It is well-observed that cognitive appraisals change substantially under

situations of perceived threat (Taylor, 1983). Theories of socioemotional selectivity (Carstensen et al., 2003) and terror management (Pyszcynski et al., 2021) highlight increasing emphasis on meaning and symbolic values in the face of shorter time-spans and threat of death. One consequence of a background of generalised threat might be that the relative weightings of dimensions might shift. For example, altruistic intentions might start to be valued more, in line with work showing that threatening events lead to greater endorsement of social values and prosociality (Maki et al., 2019). Alternatively, if the severity of a crisis means that help is viewed as particularly important and valuable or if general levels of appreciation tend to increase (Frias et al., 2011), perceptions of the intention to help might matter less.

The final reason we sought to examine this was because we were interested in whether gratitude towards people on the basis of the kind of work they did, might in turn predict judgments of how much these workers should be rewarded. In the UK at the time, this was a particularly pertinent question: there was much public and media discussion of a perceived disconnect between the public outpourings of gratitude and the inconsistent application of pay rises to essential workers (Walker, 2020). Models of gratitude offer a potential explanation for this in line with its theoretical role as a key emotional determinant of reciprocating behaviours (Gouldner, 1960; Trivers, 1971). There is now a substantial body of evidence on the role of gratitude not only in driving reciprocal prosocial behaviour (Yost-Dubrow & Dunam, 2017; Ma et al., 2017) but also showing a simple positive relationship between feelings of gratitude and reciprocity in the form of financial reward-giving (DeSteno et al., 2010; Ma et al., 2015; Tsang, 2006; 2007). If people experience higher levels of gratitude towards some kinds of workers, then they may also expect higher levels of pay for these same workers.

It is important, however, to again take account of the backdrop of the Covid-19 pandemic. Exogeneous crises with an identifiable enemy have been repeatedly shown to elicit 'rally effects': a move away from individualised identities towards a unified superordinate social or national identity (Bol et al., 2020; Roccato et al., 2021). 'Rally around the flag' effects typically focus on increases in political approval and institutional trust and are thought to arise because they enable society to respond to shocks cohesively as a unit (Chatagnier, 2012). If such effects are accompanied by the expectation that everyone is expected to act together and do their bit, then it is conceivable that essential workers are expected to pitch in and do their bit without corresponding recompense regardless of the level of gratitude felt towards them. Alternatively, gratitude might continue to play a role in predicting reward even during a time of crisis. We sought to establish this by testing whether appraisal-elicited gratitude towards essential workers positively predicts judgments of how much pay these workers should receive.

Study 1

To examine this, we selected eight different jobs categorised as essential work in the UK during the initial Covid-19 response and asked participants to make a series of judgments about them, including how much gratitude they felt towards individuals doing the work. We captured the three appraisal dimensions by updating the model to ask (a) how essential the work is to the UK's Covid-19 response, (b) how much risk or personal cost the work represents during the UK's Covid-19 response and (c) how motivated people who do the work are by a sincere desire to help (to capture perceptions of altruistic intentions). We predicted that these appraisals would determine gratitude towards different kinds of essential work and that they would mediate the relationship between this and a measure of trait

gratitude. Having established that this model applies when making judgments about essential workers in the context of the pandemic, we were next interested in whether self-reported levels of gratitude towards workers predicts judgments of the level of pay these workers *should* receive for their jobs. This was examined in two ways. We asked participants to rank all eight jobs according to how much they think they earn (perceived income rank), how much they think they *should* earn (desired income rank) and how much gratitude they feel towards them (gratitude rank). We predicted that desired income rank would positively and more strongly predict gratitude than perceived income rank. We selected rank measures because we anticipated this would be easier for participants to answer than absolute indicators of income and gratitude. Secondly, for those three jobs ranked as highest, middle and lowest gratitude, we asked participants to indicate how much they think individuals doing this work *should* earn. This provided an absolute measure of desired pay. It was expected that desired income judgments would increase with gratitude ranking.

Method

Participants. Prior to recruiting and collecting data, all protocols were reviewed and approved by the relevant Faculty Academic Ethics Committee at [institution name redacted for anonymization purposes] (code /#9578/sub1/R(A)/2021/May/BLSS_FAEC). Participants were recruited online through Reddit, the popular bulletin-style discussion website. Reddit is comprised of thousands of sub-reddits, which can be regarded as niche branches of the main forum that are more focused and oriented toward discussion on a given topic, each of which are governed by a moderator-approved set of regulations. The two sub-reddits from which participants were recruited were /r/CasualUK (www.reddit.com/r/CasualUK) and /r/CoronavirusUK (www.reddit.com/r/CoronavirusUK). Given the focus of the study on

gratitude within the UK Covid-19 context, both sub-reddits were expected to reach participants who were from the UK and presently informed on the evolving Covid-19 situation (one aspect of which would be media coverage of key workers). Participants were recruited using a volunteer sampling method over a two-day period in June 2020, around 9-10 days after the first national lockdown measures began to be eased in the UK. Access to the survey was provided via moderator-approved advertisements posted on each sub-reddit. Participants were not compensated for their time to complete the survey. The target sample size (minimum n = 200) was determined prior to data analysis and was based on previous work on the state-trait model of gratitude (Bridger & Wood, 2017; Wood et al., 2008).

After giving consent, participants completed an initial attention check and were screened out of the study if they responded incorrectly to this. Participants were included in the final sample (n = 222) if they had complete data on all initial ranking questions. Twenty of these participants did not provide complete data on desired income judgments and another participant did not complete all of the job ratings or trait gratitude questions. A minority of participants also did not complete all demographic questions assessed at the end of the survey. Mean age was 32.49 (n = 210, SD = 9.65; range = 18 - 79). Of those who reported gender and ethnicity (n = 216), just over half identified as female (n = 111, 51.3%; male, n = 103 [47.7%], other, n = 2 [<.1%]; see Table S1 for detail on sample ethnicity). Two-hundred and nineteen participants reported their essential worker status: 24% indicated they were themselves an essential worker, 49% indicated that someone they are close to is an essential worker, 23% said they did not know anyone who is classified as an essential worker, and 4% said they weren't sure.

Materials and Procedure. The key stimuli that participants were asked to rate or rank along a variety of measures were eight jobs, all of which were deemed to fall under the UK Government's definition of jobs that are essential to the UK's Covid-19 response

(Department for Education, 2020) at the time data was collected (June 9th-10th 2020). In order to ensure there was variety in essential work, one job was selected from each of the 8 sectors the UK Government defined as essential: police officer (public safety and national security); journalist (key public services), primary school teacher (education and childcare), nurse (health and social care), lorry driver (transport), benefit support officer (local and national government), call centre worker (utilities, communication and financial services), supermarket checkout (food and necessary goods). Jobs were selected on the basis that most people would have either interacted with people performing this kind of work or would have a clear conceptualisation of the work involved. Data on gross pay per annum for each job were taken from a 2018 Office for National Statistics (ONS) release of the Annual Survey of Hours and Earnings (ONS, 2018).

Participants were first asked to rank the eight jobs according to how much they thought annual income currently is, where 1 = *highest annual income* and 8 = *lowest annual income*, before using the same 1 – 8 ranking to indicate what they thought their annual income should be. They then ranked the eight jobs according to "how much gratitude you feel towards people undertaking this work", where 1 = *the job towards which you feel the most gratitude* and 8 = *the job towards which you feel the least gratitude*. Participants were next asked what they thought the typical income for people in some of these jobs should be, specifically how much they thought they should earn each year before taxes. Participants were only asked about three of the eight jobs; those which they had ranked first, fourth, and last (eighth) in terms of gratitude. This question was limited only to this sub-set of jobs because our previous experience with asking people to provide salary estimates indicated that this is quite difficult for people to answer and we wanted to minimise survey length and the likelihood of drop-out. Asking participants to provide judgments for only three out of eight jobs minimised demands on participants whilst allowing a linear relationship between

gratitude and desired pay to be assessed. Importantly, participants were simply shown three categories of job to provide a desired salary answer and the survey was programmed to ensure the three categories shown were those that participants had rated as first, fourth and eight in gratitude. Participants were not reminded of their gratitude rankings for these three jobs and no reference to previous questions or responses was made.

Next, participants rated the 8 jobs according to (i) how essential they are to the UK's Covid-19 response (from 1 = *not at all essential* to 6 = *absolutely essential*), (ii) how much risk or personal cost they represent during the UK's Covid-19 response (from 1 = *no risk or personal cost at all* to 6 = *very high levels of risk or personal cost*), (iii) how motivated people who do the work are by a sincere desire to help with the UK's Covid-19 response (from 1 = *not at all motivated* to 6 = *totally motivated*). These three questions were adapted to the Covid-19 response context but were designed to measure appraisals of value (how essential), cost (risk or personal cost) and motivations to help. Finally, participants rated each job according to how much gratitude they feel towards people doing this kind of work (where 1 = *no gratitude* to 6 = *very high amounts of gratitude*).

Trait gratitude was measured using the Gratitude Questionnaire-6 (GQ-6; McCullough, Emmons & Tsang, 2002). The GQ-6 is comprised of six-items (e.g. "I have so much in life to be thankful for" and "I am grateful to a wide variety of people") and responses are given on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*). Two items are reverse scored ("When I look at the world, I don't see much to be grateful for" and "Long amounts of time can go by before I feel grateful to something or someone") and potential scores range from 6 to 42. The scale has good internal consistency (Cronbach's $\alpha = .823$) despite its brevity. Participants were also asked if they took part in the clap for key workers on Thursday evenings (*Yes, Sometimes, No*) and where they usually stand on political issues (1 = *very left-wing*, 2 = *fairly left-wing*, 3 = *slightly left of centre*, 4 = *centre*, 5 = *slightly right of centre*, 6

= *fairly right-wing*, 7 = *very right-wing*). The survey included a number of questions designed to categorise respondents into one of five categories of the NS-SEC self-coded version (ONS, 2001), as a proxy measure of social class, before closing with demographic questions on age, gender and ethnicity.

Results

Complete data and analysis scripts for Study 1 and 2 are available at https://osf.io/ecd49. Figure 1a shows the mean ratings participants gave for 'how essential to the Covid-19 response', 'how much risk or personal cost' and 'how much motivated out of a sincere desire to help' each job-type was. Figure 1b in turn shows the mean ratings for gratitude towards people doing this type of work. Where ratings on all three appraisals were high (Nurses) participants indicated the highest levels of gratitude, and conversely where ratings on all three appraisals were low (e.g. Call Centre Workers), gratitude ratings were lowest. Ratings on the appraisal dimensions did not always correspond to one another: Supermarket Checkout Assistants, for example, were rated as highly essential and risky, but relatively low on sincere desire to help.

Mean trait gratitude was 31.75 (SD = 6.52) and was slightly negatively skewed (-.69) such that more respondents tended to be higher in trait gratitude but otherwise appeared relatively normally distributed. Trait gratitude significantly predicted reporting taking part in the "Clap for Carers" (see Supplemental Materials and Table S2). Means, standard deviations and zero-order correlations for key variables are shown in Table S3.

The key hypotheses derived from the social-cognitive model (see Figure 2) were that the appraisal judgments (how essential, how much cost/risk, whether done out of a sincere desire to help) would predict gratitude ratings towards different kinds of essential work and

that these appraisals would mediate trait gratitude and gratitude ratings. These hypotheses were tested using multilevel models because appraisals and gratitude ratings (Level-1) were clustered within-participants (Level-2), violating the assumption of nonindependence (Hayes & Rockwood, 2020). Specifically, these hypotheses were tested using Rockwood's 'MLmed' macro, which enables 2-1-1 mediation models of this kind to be tested in SPSS and returns an estimate of any indirect effects between Level-2 predictor and Level-1 outcome through Level-1 mediators. In a first step the Level-1 mediators were regressed onto the Level-2 predictor, trait gratitude (Model 1). Next, the Level-1 outcome (gratitude ratings) was regressed onto all three mediators and the Level-2 predictor trait gratitude (Model 2). Models included a random intercept for participants and age as a continuous covariate.

The model outputs are shown in Table 1. Between-participant variance in trait gratitude predicted appraisals of how essential work is (b = .153, SE = .040, t = 3.854, p < .001) and of the extent to which work is done out of a sincere desire to help (b = .191, SE = .058, t = 3.32, p = .001), but did not predict appraisals of cost or risk (b = .063, SE = .044, t = 1.43, p = .153). Model 2 shows that all three mediators predict final gratitude ratings both between- and within-participants (see Table 1) and these effects are generally strongest for ratings of how essential the work is. There was no evidence of a direct effect of trait gratitude on gratitude ratings. Estimates of indirect effects (IE) between trait gratitude and gratitude ratings were significant only through appraisals of how essential work is (IE = .069, SE = .021, Wald Z = 3.265, p = .001) and motivations of sincere desire to help (IE = .075, SE = .025, Wald Z = 3.039, p = .002; see Figure 2).

Income and Gratitude Rankings. Table S4 shows the mean rankings given for the eight job-types whilst Figure 3 shows the corresponding modes. These descriptive data indicate that the perceived ranking of existing income maps well onto actual data on income. Specifically, the sample were generally correct in indicating that Police Officers and

Journalists were the highest earners and Supermarket Checkout Assistants the lowest earners. We see also some job-types in which perceived income, desired income and gratitude rankings overlap: Police Officers, Lorry Drivers and Benefit Support Officers, whilst for others the three rankings tend to pull part. Where there are these discrepancies, desired income rankings lie between perceived income and gratitude rankings.

To determine whether rank gratitude is more strongly associated with desired than perceived income, we regressed rank gratitude simultaneously onto perceived and desired income rank for each job-type. Multilevel data were clustered within-participants but with no random intercept because ranked data cannot vary between subjects on average. Whilst perceived income rank negatively predicted rank gratitude (b = -0.245, SE = .020, $p < .001$), there was a stronger positive association between desired income and rank gratitude (b = 0.754, SE = .020, $p < .001$).

Desired Income as a function of Ranked Gratitude. 202 participants provided their desired income judgments for the jobs they had ranked first, fourth and last in terms of gratitude (see Figure 4). To address extreme outliers provided in these income judgments, all data were winsorized at the 99th percentile. Whether income varied with gratitude rank was tested using a multilevel model with a random intercept and trait gratitude, age and being female as covariates. We observed a main effect of gratitude rank ($F(2, 392.512) = 133.495$, $p < .001$) and a significant effect of age ($F(1,201.504) = 5.160$, $p = .024$). The latter appears to reflect a tendency for estimates to decrease as participants get older (b = -126.918, SE = 55.87, $p = .024$). The same main effect of gratitude rank was reported when this was tested using a standard repeated measures ANOVA with 3-levels, age, gender and trait gratitude as covariates and with a Greenhouse-Geisser correction for violations of sphericity ($F(1.778, 328.911) = 5.340$, $p = .007$).

Bonferroni-corrected pairwise comparisons (controlling for age and trait gratitude) employed to break down the main effect of gratitude rank were all significant. Specifically, judgments for highest gratitude ranked job-type (M = £35,389, SE = £693) were significantly higher than those for the medium ranked (M = £27,204, SE = £683; mean difference = £8,185, standard error [SE] = £741, $p < .001$) and lowest ranked job-type (M = £23,576, SE = £680; mean difference = £11,813, SE = £738, $p < .001$). In turn, desired income judgments for the middle-ranked gratitude job-type were higher than for the lowest ranked job (mean difference = £3,628, SE = £731, $p < .001$).

Discussion

In line with the model predictions, all three appraisal dimensions predicted feelings of gratitude towards essential workers. Moreover, feelings of gratitude towards essential workers were positively associated with how much participants desired workers' annual income to be. These data comprise the first demonstration that these appraisals continue to predict gratitude and that gratitude is associated with judgments of monetary reward when participants are not the direct beneficiaries of help but when the benefits of help - or work, in this case - are to society in general, during a period of national crisis. We discuss this and other elements of the findings in greater detail in the General Discussion. Before that, we address an aspect of the result that was not anticipated.

We found that ranked gratitude negatively predicted perceived income rank, such that participants were likely to rank work more highly on gratitude if they perceived people in this line of work to receive relatively low pay. One explanation for this within the social-cognitive model would be if perceptions of existing pay influence any of the three benefit appraisals. It is reasonable, for example, to hypothesise that perceiving a worker to be relatively highly paid might influence judgments of whether someone is working out of a

sincere desire to help or not, because evidence of high extrinsic reward might signal an ulterior motive for working. Conversely, perceiving someone to continue to work for relatively low pay might in part induce the impression that they are doing so out of a genuine desire to help (although it is certainly not the only explanation available). To test this post-hoc hypothesis we examined whether the three benefit appraisals predict perceived income rank. When the three appraisals are simultaneously regressed onto perceived income rank (using a multilevel model comparable to those reported above), perceptions of genuine desire to help significantly negatively co-varied with perceived income rank (b = -.274, SE = .043, p < .001), whereas perceptions of how essential (b = -.043, SE = .044, p = .340) and costly the job was (b = .063, SE = .041, p = .129) did not. This partially supports the inference that participants made evaluations about whether someone was working out of a genuine desire to help on the basis of how much they perceive them to be earning (and vice versa), and that this is a determinant of gratitude towards workers.

The implication of this is that gratitude towards workers is not only related to desired pay reward for those workers but is also contingent on how much we perceive current income to be for those workers. Study 2 was designed to provide an explicit test of this hypothesis by directly manipulating what participants are told about the current earnings of an essential worker. It was predicted that participants would report higher gratitude towards workers receiving relatively low pay.

Study 2

This study was designed to (i) provide a conceptual replication of the main findings from Study 1 regarding the state-trait model of gratitude towards essential workers and (ii) directly test the hypothesis that the strength of gratitude felt towards an essential worker is contingent on how well they are thought to be paid. This was tested by manipulating what

participants were told about the current earnings of essential workers (either high or low). If gratitude is in part determined by perceptions of income then it is predicted that participants will indicate that they feel more gratitude towards workers receiving relatively low pay. The key predictions therefore were that perceptions of pay, gratitude and appraisals of whether workers were motivated by a sincere desire to help would differ between the high- and low-income conditions. We also expected that appraisals of how valuable the work is to Covid-19 efforts and motivations of sincere desire to help would mediate the relationship between trait gratitude and gratitude towards workers. We did not assess appraisals of personal cost or risk as these were not found to mediate the trait-state connection in Study 1 (see General Discussion). Finally, we asked participants to make evaluations using vignettes aligned to four (of the original eight) job sectors deemed 'essential': health care, education, food distribution and local government. This was included in order to determine whether the predictions held across job domains, although we anticipated that ratings of gratitude, appraisals of value, motivation to help and perceived pay would vary with sector, as indicated by Study 1.

Method

The protocol, materials, predictions and analyses for Study 2 were pre-registered prior to collection of data (https://osf.io/ecd49).

Participants. All procedures were independently reviewed and approved by the relevant Faculty Academic Ethics Committee. Participants were recruited through Prolific.co and Reddit and were required to be over 18 and living in the UK. Data were collected over a week in August 2021. Of the final 472 participants included in the study, 456 provided data on their age (mean age = 33.11, SD = 10.36, range = 18-67) and 463 provided data on their

gender; just over half of whom identified as female (*n* = 262, 56.6%; male, *n* = 192 [40.7%], other, *n* = 9 [1.9%]).

The target sample size was set at 472 participants on the basis of *a priori* power analysis to compute the required sample-size to detect a between-group difference in gratitude with standard power assumptions (power = .80, one-tailed test, alpha = .05) with a small effect size (d = .23). The effect size was selected following initial pilot testing of the four high- and low-income scenarios (N = 20) which revealed differences in gratitude between the high- and low-income conditions for the health (d = .28), education (d = .23) and local government scenarios (d = .72), but not for food distribution (d = .04). We therefore set our target sample size to be that which would allow us to detect the smallest of these (.23) with standard assumptions (see above). The minimum sample size for this was 470 (n=235 per condition). 470 is not divisible by 8 (see counterbalancing below), so we rounded up the target sample size to 472 (236 in each income condition).

Design. Study 2 comprised a mixed design with one between-subjects factor of income (two levels: high income, low income) and one within-subjects factor of job sector (four levels: health care, education, food distribution, local government). The job sector factor was reduced to these four categories in order to minimise study length and likelihood of participant fatigue. These four categories were chosen because they encompassed the main sectors employed in Study 1 (with the exception of journalism). All participants were presented with four vignettes introducing one of four workers (Harveen, Joanne, Mohammed and Phil) each working in one of the four sectors classified as essential. Each vignette introduced the worker, explained why their work was deemed to be essential and indicated the gross income for the worker for the previous year. Gross annual income was a randomly selected integer between £40,000 and £44,999 (high-income condition) or between £15,000 and £19,999 (low-income condition).

Vignettes were counterbalanced to ensure that each named worker was equally likely to be associated with each job domain across participants. Using a Latin-square rotation this yielded 4 counterbalance versions for each income condition. An example vignette in which Harveen was working in health care in the high-income condition is as follows:

> Harveen works in health care. During the pandemic Harveen was classified as a key or critical worker, because the Government deemed her work to be essential to the UK's coronavirus (COVID-19) response. This is because she was part of a team providing frontline health care during the pandemic. Last year, Harveen's gross income was £41,228.

Procedure and Measures. The order in which vignettes were presented was randomised for each participant. After each vignette, participants were asked "How well paid do you think [name] was for her/his work?" (where 1 = *not at all well paid* and 10 = *very well paid*), "how motivated do you think [name] was by a sincere or altruistic desire to help?" (where 1 = *not at all motivated by a sincere or altruistic desire to help* and 10 = *Totally motivated by a sincere or altruistic desire to help*) and "how valuable to the UK's COVID-19 response do you think [name]'s work was? (where 1 = *not at all valuable* and 10 = *very valuable*). The key dependent measure for each vignette was the response to the question "to what extent do you feel grateful to [name] for his/her work? (where 1 = *not at all grateful* and 10 = *very grateful*). Participants were not asked a corresponding question on perceived cost to workers because there were no a priori predictions relating to this variable and because this dimension was not predicted by trait gratitude in Study 1 (see General Discussion for further comment on this).

Participants were also asked to rate how they think each of the following would make key workers feel: receiving a thank you letter, seeing lots of people engage in the clap for key workers, seeing lots of people sign a petition to support a pay rise, receiving a pay rise. Analyses of these data can be found in Supplemental Materials. Participants again completed the 6-item Gratitude Questionnaire-6 and were asked for their age, gender and whether they

took part in the clap for key workers on Thursday evenings from March – May 2020 (yes, sometimes, no).

Results

In order to test whether appraisals of desire to help and value to the Covid-19 effort mediate the association between trait gratitude and gratitude ratings, we followed the same analysis strategy as in Study 1. The MLmed macro was used to simultaneously estimate indirect effects in a 2-1-1 model with age as a covariate. Table 4 reports these analyses. Between-participant variance in trait gratitude predicted appraisals of how valuable work is (b = .495, SE = .047, t = 10.60, p < .001) and of the extent to which work is done out of a sincere desire to help (b = .497, SE = .052, t = 9.60, p < .001). Appraisal mediators predicted gratitude ratings both between- (desire to help, b = .188, SE = .031, t = 6.15, p < .001; perceived value, b = .834, SE = .033, t = 25.04, p < .001) and within-participants (desire to help, b = .184, SE = .018, t = 10.30, p < .001; perceived value, b = .697, SE = .020, t = 34.51, p < .001). Both indirect effects were significant: perceived value (IE = .413, SE = .042, Wald Z = 9.7579, p < .001) and motivations of sincere desire to help (IE = .093, SE = .018, Wald Z = 5.159, p < .001). The direct effect remained significant indicating that mediation through the two appraisal dimensions was partial (b = .203, SE = .046, t = 4.47, p < .001).

Mean trait gratitude was 31.47 (SD = 6.66) and was again slightly negatively skewed (-.73). Means, standard deviations and correlations for all key variables are shown in Table S6. We again found that trait gratitude predicted taking part in the ‘Clap for Carers’ (see Supplemental materials and Table S7).

Next, we assessed the key pre-registered predictions relating to the income manipulation. The first analysis assessed whether the income manipulation successfully influenced perceived income. A mixed ANOVA with job sector (4 levels) as a within-subjects and income (2 levels) as a between-subjects factor, revealed a significant main effect of income condition ($F(1,470) = 661.39$, $p < .001$; see Figure 5a). There was also a main effect of sector $F(2.851, 1339.985) = 144.447$, $p < .001$) and a significant interaction ($F(2.851, 1339.985) = 5.310$, $p = .002$), as the food distribution and local government vignettes were typically rated as better paid.

A comparable ANOVA on gratitude ratings also revealed a main effect of income condition ($F(1,469) = 4.287$, $p = .039$), confirming the main prediction that gratitude ratings would be higher in the low income condition (see Figure 5b). Gratitude ratings also significantly varied with job sector ($F(2.837,1330.428) = 192.437$, $p < .001$) such that they were highest for the health care scenario and lowest for local government. There was no significant interaction ($F(2.837,1330.428) = .640$, $p = .581$).

In contrast to our predictions, ratings of sincere desire to help did not differ significantly with income condition ($F(1,469) = .197$, $p = .657$), however, they did vary with job sector ($F(2.572,1206.399) = 352.082$, $p < .001$) such that they were highest for health care and education. The interaction was also significant ($F(2.572,1206.399) = 3.647$, $p = .017$; see Figure 5c), however, there were no significant effects of income condition when this was compared separately for each level of job sector (all ps > .139).

There was also no effect of income condition ($F(1,470) = .435$, $p = .510$) or interaction for ratings of how valuable to UK's Covid-19 response each vignette was ($F(2.911,1368.288) = .616$, $p = .600$), although there was a main effect of job sector ($F(2.911,1368.288) = 176.997$, $p < .001$), which mirrored the pattern of gratitude ratings (see Figure 5d).

Finally, we examined whether there were indirect effects of the income manipulation on gratitude ratings by way of ratings of sincere desire to help. The macro was again employed to estimate indirect effects except now with the income manipulation (low income = 0; high income = 1) as a predictor instead of trait gratitude. There was a main effect of income condition on gratitude ratings (b = -.357, SE = .169, t = 2.11, p = .036), confirming the effect of the manipulation. In line with the findings reported above, however, there was no effect of the income manipulation on appraisals of how valuable work is (b = .101, SE = .096, t = 1.06, p = .291) or of the extent to which work was perceived to be done out of a sincere desire to help (b = .063, SE = .106, t = .59, p = .553). The direct effect remained significant when the mediators were included (b = -.458, SE = .084, t = -5.43, p < .001) and neither indirect effect was significant: perceived value (IE = .088, SE = .084, Wald Z = 1.055, p = .292) and motivations of sincere desire to help (IE = .013, SE = .022, Wald Z = .586, p = .558). On this basis, therefore the data do not indicate that the effect of the income manipulation on gratitude ratings was mediated by appraisals of sincere desire to help.

General Discussion

The present research demonstrates that the same benefit appraisals encapsulated in Wood et al.'s social-cognitive model of gratitude underpin self-reported gratitude towards remote and unidentified workers during a period of crisis and uncertainty. As in Wood et al.'s original test of the model, the strongest determinant of gratitude was evaluations of how essential or valuable the key worker's job was to the lockdown effort. These value appraisals were typically highest for nurses (Study 1) or someone working in health care (Study 2) and accordingly, feelings of gratitude reported by participants were also highest for workers in these categories. The gratitude appraisal model therefore continues to hold for feelings towards distant workers contributing to the national Covid-19 effort. Moreover, gratitude

predicted judgments of financial compensation for essential workers: Rank gratitude strongly predicted desired income rank when perceived income rank was controlled, and absolute judgments of desired income were highest for jobs ranked first on gratitude compared to those ranked fourth and last. This pattern held when judgments did not include cases where participants were most grateful to nurses. This is necessary to establish because it is possible the effect may also reflect greater social expectations to express gratitude towards nurses and to indicate higher pay, given the media attention on healthcare workers at the time of data collection for Study 1.

These data comprise the first report that gratitude is associated with judgments of monetary reward when participants are not the direct beneficiaries of help but when the benefits of help - based on a person's work, in this case - are to society in general during a period of considerable uncertainty. Whilst rally effects are likely to operate during the Covid-19 pandemic (Bol et al., 2020), the current data indicate that felt gratitude continued to predict desired financial reward for those on the frontline of the Covid-19 response. This may in part also explain public upset around low pay for frontline workers in the UK during this time (Lintern, 2020). Whilst public expressions of gratitude and clapping might reflect visible rallying around and support for workers, it does not preclude sufficient financial reward for those workers whose contributions were perceived to be most valuable and costly (Darlow, 2020).

The present findings add another dimension to this relationship between gratitude and financial reward. Across both studies, we find a relationship between gratitude and current level of salary reward, such that gratitude is higher towards workers who are currently perceived as low-paid. In part due to the observation that, in Study 1, perceptions of working out of a genuine desire to help were the only benefit appraisal to co-vary with perceived pay, we hypothesised that higher gratitude towards lower-paid individuals arises because they are

perceived to be more likely to be working out of a genuine desire to help than higher-paid workers on the basis of their low pay. We did not find evidence of this in Study 2, however; there was no systematic relationship between the income manipulation and perceptions of desire to help. This raises two questions. Firstly, might the difference in gratitude across income conditions be driven by the appraisal dimension that was not assessed in Study 2: appraisals of cost to the helper? These findings are potentially reconcilable within the existing appraisal model if income is employed as a marker of opportunity costs to the worker. The decision not to collect this measure was short-sighted given this is a key dimension for determining state gratitude according to Wood et al.'s model. The second question is might this unexpected finding in Study 2 arise because of the different way in which high vs. low salary was operationalised in the two studies. Whilst in Study 1, salary varied across different job sectors by asking participants to explicitly rank jobs relative to one another, in Study 2 salary differences were manipulated within job domain (albeit between-subjects). Participants may use salary as an indicator of the reason why a person does a particular kind of job principally when comparing across sectors (e.g. contrasting a journalist and a nurse), perhaps on the basis that some sectors are thought to be less well-paid than others in general. Indeed participants tended to rate health and education work as less well-paid than the other two sectors (see Figure 5a). When comparisons are made within a particular sector, however, participants may view salary as less indicative of the extent to which the work is engaged in altruistically and may instead be used to infer levels of training or experience.

Further work is clearly needed to unpick the precise appraisals that drive this negative relationship between current perceptions of pay and gratitude. We nonetheless view these findings as noteworthy because they represent novel insights into psychological perceptions and appraisals of the social value of different kinds of work. This is as a broadening of

existing working on the reputational consequences of helping behaviours (Berman & Silver, 2022), but now with respect to different professions and how much these should be financially rewarded (although see Caviola et al. 2021, for work on judgments on whether the lives of more "socially beneficial" people should be saved). Such insights are relevant in the context of claims such as that made by anthropologist David Graeber (2018) that there may be a "general principle that the more one's work benefits others, the less one tends to be paid for it" (pp. 212). Graeber also posits that one reason for the perception of an inverse relationship of this kind may be because choosing work that is socially beneficial is seen to be intrinsically rewarding, obviating or perhaps even replacing the need for extrinsic reward. Indeed in some sectors, such as nursing, it is reasonable to expect that these social benefits drive choices to enter certain professions (Prater & McEwen, 2006). Whilst establishing whether such an inverse relationship objectively exists is difficult due to the highly subjective nature of social value (Lockwood et al., 2016), arguably more tractable is asking whether people generally (i) perceive there to be an inverse relationship between salary reward and what they see as socially valuable and (ii) whether they think this should be the case. If the current measures of gratitude towards different professions can be employed as a broad proxy for perceived social value then the present results could be taken as initial answers to these questions: yes, as pay goes down, perceived value or gratitude increases and no, respondents indicate that as social value of work increases so should remuneration.

When we examined whether the trait-state gratitude association was mediated by the three appraisal dimensions, we found that this was the case for evaluations of how essential work is and the extent to which work was conducted out of a sincere desire to help but not perceptions of the risk or cost to workers in Study 1. One explanation for this relates to the fact that participants were asked about risk *or* personal cost to essential workers, rather than cost alone as conceptualised in the original Wood et al. model. This may have confused

participants or have introduced an additional source of variance if some participants evaluated risk whilst others evaluated cost. Speaking against this account is the observation that although these appraisals did not co-vary with trait gratitude, they nonetheless predicted reported gratitude towards workers. On closer inspection, finding that trait gratitude does not predict appraisals of cost is also consistent with data reported by Wood et al. (2008) in the study most closely related to the design reported here. In their second study investigating mediatory pathways between trait gratitude and feelings of gratitude assessed in daily diaries, mediation was reported for evaluations of value and helpfulness but not cost. This pattern was directly replicated in the current data. It appears therefore that although evaluations of cost relate to specific levels of gratitude in the moment or to a particular person, dispositional gratitude as captured by the GQ-6 does not predict variance in judgments of personal cost to the helper.

There are other limitations to consider. One issue that applies to both studies is the use of single-item measures of gratitude towards broadly described essential workers as opposed to the capture of stronger feelings of gratitude towards a specific essential worker with whom participants have had a meaningful interaction. Although we see the value of these more immersive measures of gratitude, we did not employ this here because this has been reported elsewhere (Wood et al., 2008) and because we were interested primarily in whether the same model of gratitude would hold when explaining feelings of gratitude towards distal workers whose jobs are viewed to benefit broader society during a time of crisis. Although the reported feelings are necessarily weaker than those elicited by benefiting from specific and direct acts of help, the key finding here is that the core appraisal model holds true. It is this extension of the same underlying model that we find to be of value. Single-item measures of appraisal were employed following the approach taken in previous work with this model (Wood et al., 2008; Bridger & Wood, 2017), yet are likely to be more susceptible to biases

than multi-item measures. There are related concerns about common method variance in both studies and the possible inflationary impact this may have on coefficients. Future work should seek to establish that associations between appraisals, gratitude and desired remuneration remain consistent when these are not measured simultaneously.

The present studies show that a social-cognitive model of interpersonal gratitude (Wood et al., 2008) can also explain feelings of gratitude towards essential workers, which in turn predict judgments of desired pay for these workers. The model continues to link well with dispositional gratitude, which predicted public expressions of gratitude towards essential workers. We also find that current level of income is a determinant of feelings of gratitude, such that participants report higher levels of gratitude towards workers who receive low pay. Together, these findings extend the existing appraisal model of gratitude and help explain high levels of gratitude towards essential workers in general as well as to specific sectors, such as health, where work is seen to be extremely valuable, conducted out of a sincere desire to help others yet relatively poorly paid.

References

Berman, J. Z. & Silver, I. (2022). Prosocial behavior and reputation: When does doing good lead to looking good? *Current Opinion in Psychology*, *43*, 102-107.

Bol, D., Giani, M., Blais, A. & Loewen, P. J. (2020). The effect of COVID-19 lockdowns on political support: Some good news for democracy? *European Journal of Political Research, 60*(2), 497-505. https://doi.org/10.1111/1475-6765.12401

Bridger, E. K. & Wood, A. (2017). Gratitude mediates consumer responses to marketing communications. *European Journal of Marketing, 51*(1), 44-64.

Carstensen, L.L., Fung, H.H., & Charles, S.T. (2003) Socioemotional selectivity theory and the regulation of emotion in the second half of life. *Motivation and Emotion, 27*, 103–123.

Carstensen, N., Mudhar, M. & Munksgaard, F. S. (2021). 'Let communities do their work': the role of mutual aid and self-help groups in the Covid-19 pandemic response. *Disasters, 45*, S146-S173. https://doi.org/10.1111/disa.12515

Chang, Y.-P., Lin, Y.-C., & Chen, L. H. (2012). Pay It Forward: Gratitude in Social Networks. *Journal of Happiness Studies, 13*(5), 761-781

Chatagnier, J. T. (2012). The effect of trust in government on rallies 'round the flag. *Journal of Peace Research, 49*, 631-645. https://doi.org/10.1177%2F0022343312440808

Darlow, J. (2020). *Thanks for the support, but I don't want your clapping*. BMJ Blogs Opinion. Retrieved from: https://blogs.bmj.com/bmj/2020/04/16/jennifer-darlow-thanks-for-the-support-but-i-dont-want-your-clapping/

Department for Education (2020). Critical workers who can access schools or educational settings. Retrieved from: https://www.gov.uk/government/publications/coronavirus-

covid-19-maintaining-educational-provision/guidance-for-schools-colleges-and-local-authorities-on-maintaining-educational-provision. Accessed 13th May 2020.

DeSteno, D., Bartlett, M. Y., Baumann, J., Williams, L. A. & Dickens, L. (2010). Gratitude as moral sentiment: Emotion-guided cooperation in economic exchange. *Emotion, 10*(2), 289-293.

Fiedler, K., Harris, C. & Schott, M. (2018). Unwarranted inferences from statistical mediation tests – An analysis of articles published in 2015. *Journal of Experimental Social Psychology, 75*, 95-102.

Frias, A., Watkins, P. C., Webber, A. C. & Froh, J. J. (2011)., Death and gratitude: Death reflection enhances gratitude, *Journal of Positive Psychology, 6*(2), 154-162, DOI: 10.1080/17439760.2011.558848

Gouldner, A. W. (1960). The norm of reciprocity: A preliminary statement. *American Sociological Review, 25*, 161-178.

Graeber, D. (2018). *Bullshit jobs: A theory*. Allen Lane.

Heider, F. (1958). *The psychology of interpersonal relations*. Wiley.

Hurst, L. (2020, March 24). Coronavirus: Health workers clapped across the world for battling on the COVID-19 frontline. *Euronews*. Retrieved from: https://www.euronews.com/2020/03/24/coronavirus-health-workers-clapped-across-the-world-for-battling-on-the-covid-19-frontline

Lintern, S. (2020, August 8). NHS Protest: Staff march on London demanding planned pay rise be brought forward. *The Independent*. Retrieved from: https://www.independent.co.uk/news/health/nhs-protest-london-pay-rise-doctors-nurses-coronavirus-a9660866.html

Lockwood, B. B., Nathanson, C. & Weyl, E. G. (2016). Taxation and the Allocation of Talent. *Journal of Political Economy*, https://ssrn.com/abstract=1324424 or http://dx.doi.org/10.2139/ssrn.1324424

Ma, L. K., Tunney, R. J. & Ferguson, E. (2015). Gratefully received, gratefully repaid: The role of perceived fairness in cooperative interactions. *PLOS One, 9*(12), e114976. doi:10.1371/journal.pone.0114976

Ma, L. K., Tunney, R. J. & Ferguson, E. (2017). Does gratitude enhance prosociality? A meta-analytic review. *Psychological Bulletin, 143*(6), 601-635.

Maki, A., Dwyer, P. C., Blazek, S., Snyder, M., Gonzalez, R. & Lay, S. (2019). Responding to natural disasters: Examining identity and prosociality in the context of a major earthquake. *British Journal of Social Psychology, 58*(1), 66-87.

McCullough, M. E., Kilpatrick, S. D., Emmons, R. A., & Larson, D. B. (2001). Is gratitude a moral affect? *Psychological Bulletin, 127*(2), 249-266.

McCullough, M. E., Emmons, R. A., & Tsang, J. (2002). The grateful disposition: A conceptual and empirical topography. *Journal of Personality and Social Psychology, 82*, 112-127.

Office for National Statistics [ONS] (2001). *SOC2010 volume 3: the National Statistics Socio-economic classification* (NS-SEC rebased on SOC2010). Retrieved from: https://www.ons.gov.uk/methodology/classificationsandstandards/standardoccupationalclassificationsoc/soc2010/soc2010volume3thenationalstatisticssocioeconomicclassificationnssecrebasedonsoc2010#deriving-the-ns-sec-self-coded-method

Office for National Statistics [ONS] (2018). *Employee earnings in the UK: 2018*. Retrieved from:

https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/bulletins/annualsurveyofhoursandearnings/2018.

Office for National Statistics [ONS] (2020). *Average actual weekly hours of work for full-time workers (seasonally adjusted)*. Retrieved from: https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/timeseries/ybuy/lms

Prater, L. & McEwen, M. (2006). Called to Nursing: Perceptions of Student Nurses. *Journal of Holistic Nursing*, *24*(1), 63-69. https://doi.org/10.1177%2F0898010105282511

Pyszczynski, T., Lockett, M., Greenberg, J. & Solomon, S. (2021). Terror management theory and the COVID-19 Pandemic. *Journal of Humanistic Psychology*, *61*(2), 173-189. https://doi.org/10.1177/0022167820959488

Robinson, E. & Daly, M. (2020). Explaining the rise and fall of psychological distress during the COVID-19 crisis in the United States: Longitudinal evidence from the Understanding America Study. *British Journal of Health Psychology, 26*(2), 570-587.

Roccato, M., Colloca, P., Cavazza, N., & Russo, S. (2021). Coping with the COVID-19 pandemic through institutional trust: Rally effects, compensatory control, and emotions. *Social Science Quarterly*, *102*(5), 2360–2367. https://doi.org/10.1111/ssqu.13002

Skalski, S. & Pochwatko, G. (2020). Gratitude is female. Biological sex, socio-cultural gender versus gratitude and positive orientation. *Current Issues in Personality Psychology*, *8*(1), 1-9.

Smith, A. (1976). *The theory of moral sentiments* (6th ed.). Oxford, England: Clarendon Press. (Original work published 1790).

Taylor, S. E. (1983). Adjustment to threatening events: A theory of cognitive adaptation. *American Psychologist, 38*(11), 1161–1173. https://doi.org/10.1037/0003-066X.38.11.1161

Tesser, A., Gatewood, R. & Driver, M. (1968). Some determinants of gratitude. *Journal of Personality and Social Psychology, 9*, 233-236.

Trivers, R. L. (1971). The evolution of reciprocal altruism. *Quarterly Review of Biology, 46*, 35-57.

Tsang, J-A. (2006). Gratitude and prosocial behaviour: An experimental test of gratitude. *Cognition and Emotion, 20*, 138-148.

Tsang, J-A. (2007). Gratitude for small and large favors: A behavioural test. *The Journal of Positive Psychology, 2*(3), 157-167.

Walker, P. (2020). *Coronavirus: almost 900,000 public sector workers to get pay rise, says Sunak.* The Guardian. Retrieved from: https://www.theguardian.com/society/2020/jul/21/almost-900000-public-sector-workers-to-get-pay-rise-says-rishi-sunak

Weiner, B. (1985). An attributional theory of achievement motivation and emotion. *Psychological Review, 92*, 548-573.

Wood, A. M., Maltby, J., Stewart, N., Linley, P. A., & Joseph, S. (2008). A social-cognitive model of trait and state levels of gratitude. *Emotion, 8*, 281-290.

Yost-Dubrow, R. & Dunham, Y. (2017). Evidence for a relationship between trait gratitude and prosocial behaviour. *Cognition & Emotion, 32*(2), 397-403.

Table 1

Outcome of multilevel models assessing indirect effects of appraisals between trait gratitude and gratitude ratings for essential workers in Study 1 (n = 221)

Model	Dependent Variable		Predictor	Estimate (SE)
Model 1	Essential	Within	Constant	4.466*** (.039)
		Between	Trait Gratitude[a]	.153*** (.040)
	Cost	Within	Constant	3.762*** (.043)
		Between	Trait Gratitude[a]	.063 (.044)
	Help	Within	Constant	3.421*** (.057)
		Between	Trait Gratitude[a]	.191** (.058)
Model 2	Gratitude Ratings	Within	Constant	-.356 (.308)
			Essential	.445*** (.019)
			Cost	.278*** (.018)
			Help	.261*** (.020)
		Between	Trait Gratitude[a]	.013 (.038)
			Essential	.448*** (.071)
			Cost	.267*** (.065)
			Help	.389*** (.049)
		Random Effect Estimates (Model 2)		
				Estimate
			Essential	.028 (.033)
			Cost	.010 (.041)
			Help	.402*** (.067)
			Gratitude	.179*** (.027)

*** p<.001
** p<.01
* p<.05
[a]Variable is standardised to a standard deviation of one and a mean of zero

Table 2

Outcome of multilevel models assessing indirect effects of appraisals between trait gratitude and gratitude ratings for essential workers in Study 2 (n = 472)

Model	Dependent Variable		Predictor	Estimate (SE)
Model 1	Valuable	Within	Constant	7.964*** (.156)
		Between	Trait Gratitude[a]	.495*** (.047)
	Help	Within	Constant	6.245*** (.173)
		Between	Trait Gratitude[a]	.497*** (.052)
Model 2	Gratitude Ratings	Within	Constant	-.068 (.277)
			Valuable	.697*** (.020)
			Help	.184*** (.018)
		Between	Trait Gratitude[a]	.203*** (.046)
			Valuable	.834*** (.033)
			Help	.188*** (.031)
		Random Effect Estimates (Model 2)		
				Estimate
			Valuable	4.858*** (.161)
			Help	3.961*** (.131)
			Gratitude	1.113*** (.043)

***p<.001, **p<.01,* p<.05
Models include age as Level-2 covariate; [a]Variable is standardised to a standard deviation of one and a mean of zero

Figure Captions

Figure 1a. Mean perceptions of how essential work is to Covid-19 response, risk/personal cost of doing work and desire to help in Study 1. **Figure 1b.** Mean ratings of gratitude towards essential workers. Error bars represent 1 +/- standard error.

Figure 2. Model depicting relations between trait gratitude (Level-2) and gratitude ratings towards essential work categories (Level-1) as mediated through appraisals of different kinds of work (Level-1), in Study 2. Age is modelled as a covariate. IE = indirect effect.

Figure 3. Plot of the modal rankings for perceived income, desired income and rank gratitude for the eight essential work categories.

Figure 4. Box plots showing the desired annual income separated according to whether jobs were ranked high (1^{st}), medium (4^{th}) or low (8^{th}) in gratitude. Medians are shown as a thick black line and each box represents the interquartile range (IQR).Whiskers extend to 1.5x the size of the IQR. Circle outliers fall beyond whiskers and asterisk outliers are more than 3x the IQR.

Figure 5. Perceptions of how well paid work is (A), ratings of gratitude (B), appraisals of desire to help (C) and how valuable work is to Covid-19 response (D), by income condition and job sector in Study 2. Shown are estimated marginal means (+/-2 SE).

Figure 1.

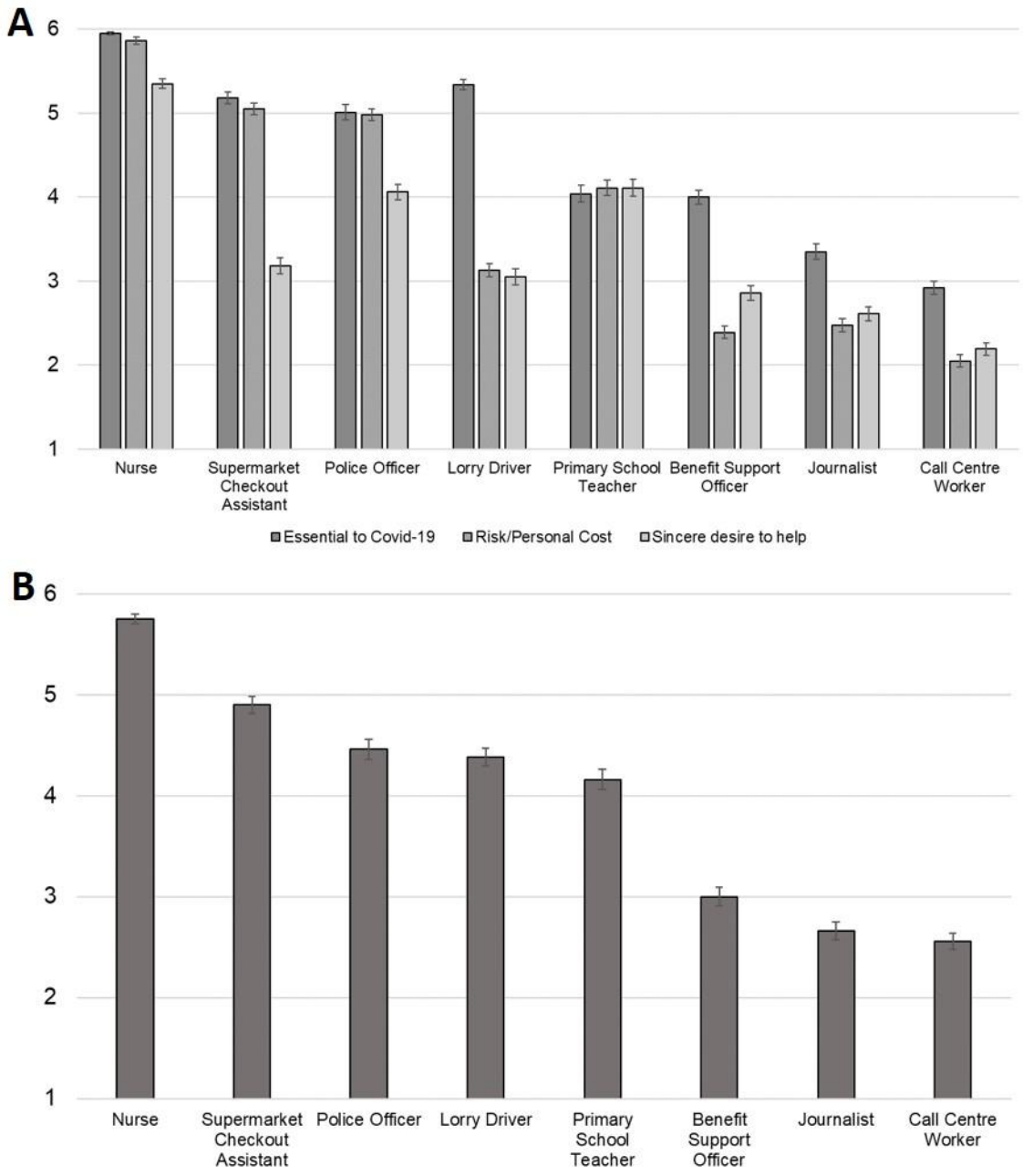

A
6
5
4
3
2
1
Nurse
Supermarket Checkout Assistant
Police Officer
Lorry Driver
Primary School Teacher
Benefit Support Officer
Journalist
Call Centre Worker
Essential to Covid-19
Risk/Personal Cost
Sincere desire to help
B
6
5
4
3
2
1
Nurse
Supermarket Checkout Assistant
Police Officer
Lorry Driver
Primary School Teacher
Benefit Support Officer
Journalist
Call Centre Worker

Figure 2.

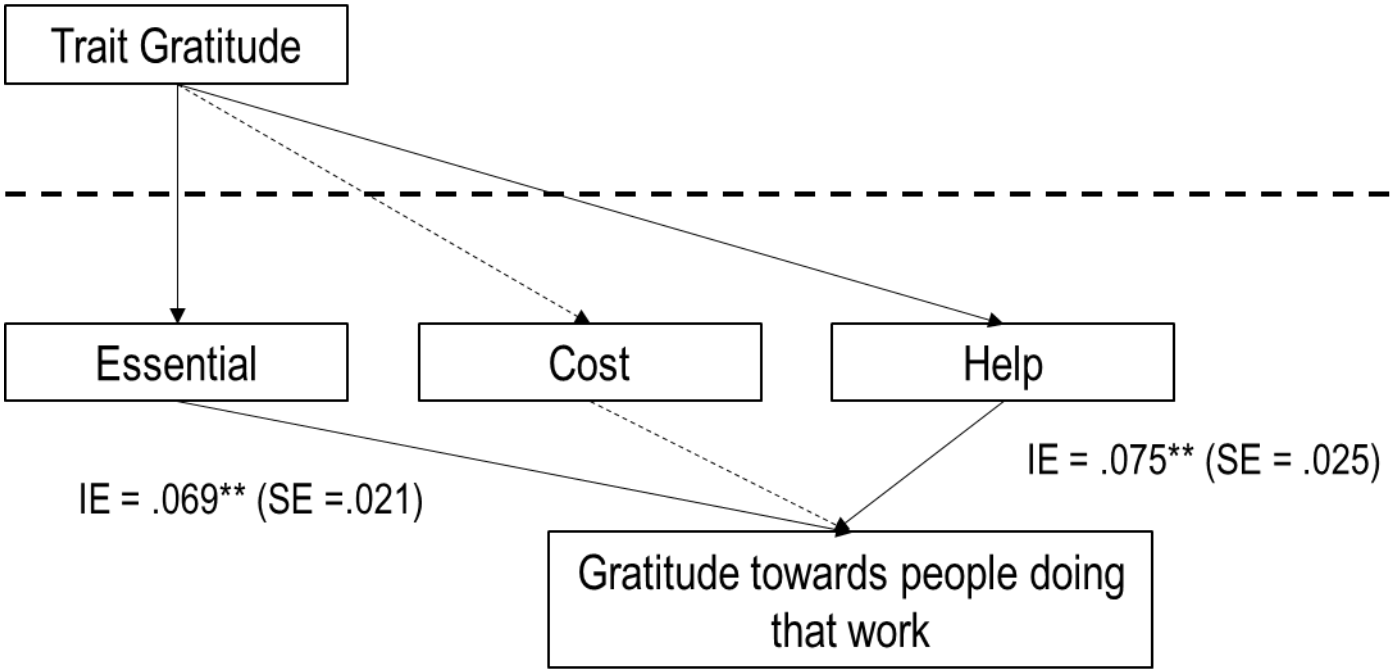

Trait Gratitude
Essential
Cost
Help
IE = .069** (SE =.021)
IE = .075** (SE = .025)
Gratitude towards people doing that work

Figure 3.

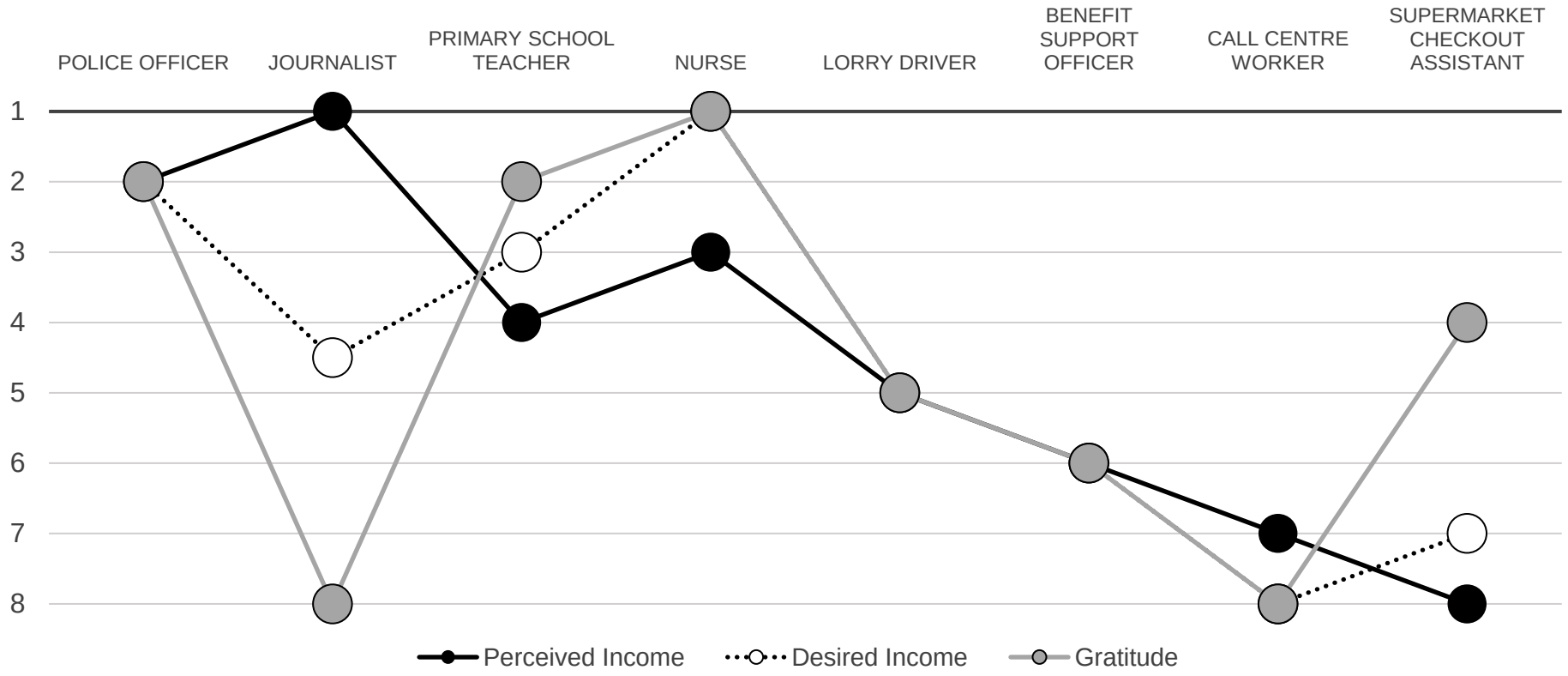

POLICE OFFICER
JOURNALIST
PRIMARY SCHOOL TEACHER
NURSE
LORRY DRIVER
BENEFIT SUPPORT OFFICER
CALL CENTRE WORKER
SUPERMARKET CHECKOUT ASSISTANT
1
2
3
4
5
6
7
8
Perceived Income
Desired Income
Gratitude

Figure 4.

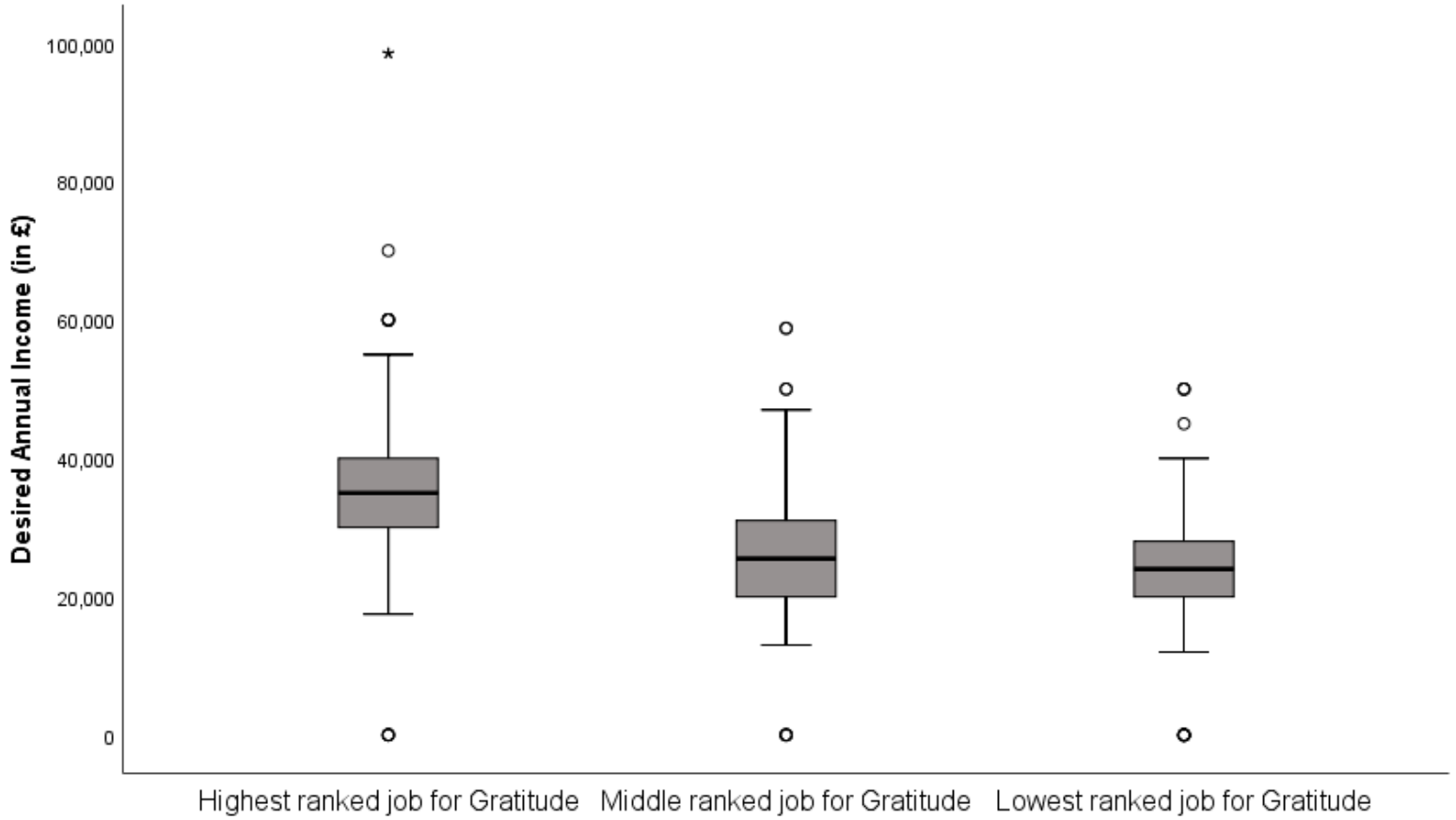
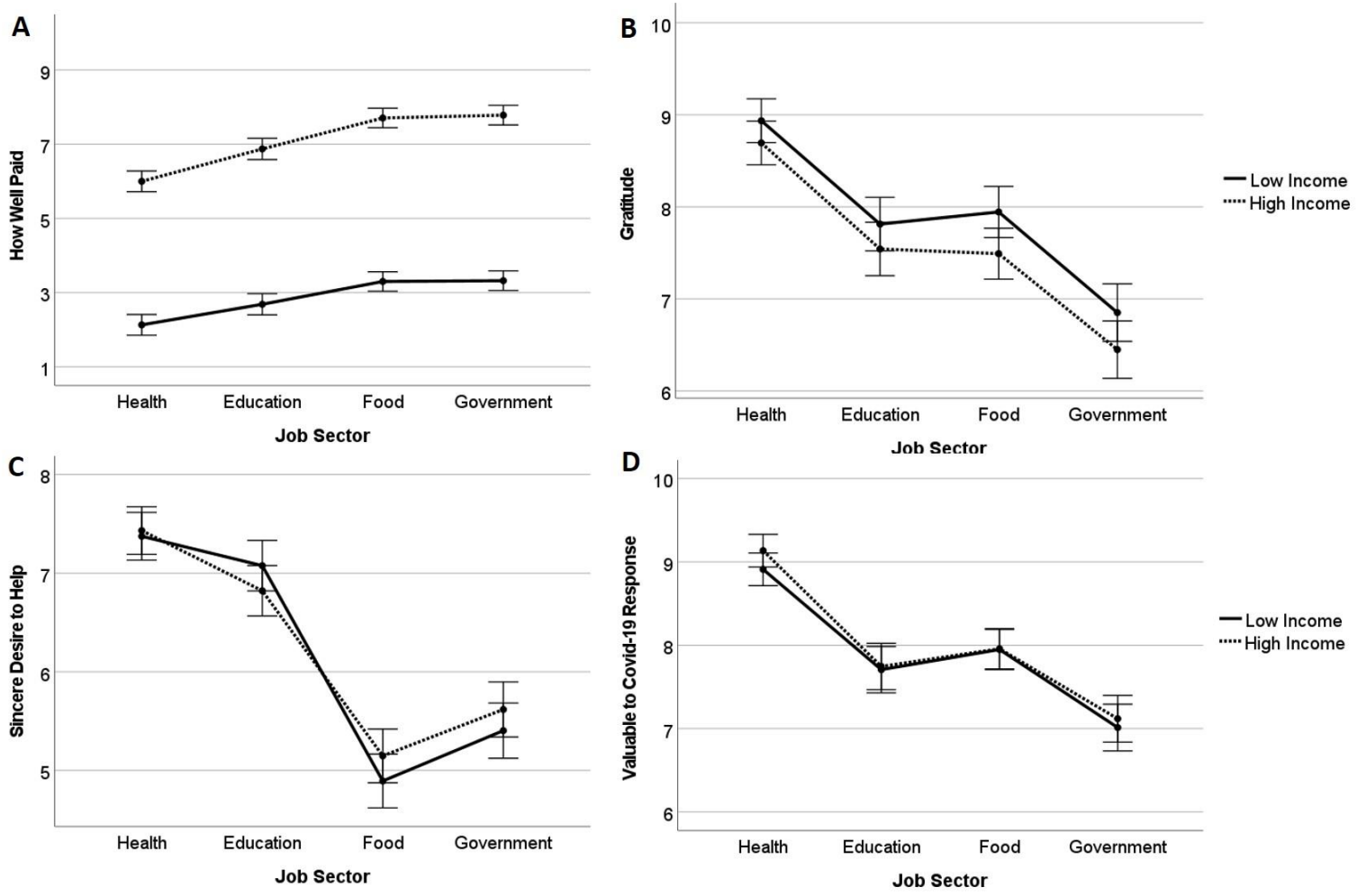

Desired Annual Income (in £)
100,000
80,000
60,000
40,000
20,000
0
Highest ranked job for Gratitude
Middle ranked job for Gratitude
Lowest ranked job for Gratitude

Figure 5.


A
How Well Paid
9
7
5
3
1
Health
Education
Food
Government
Job Sector
B
Gratitude
10
9
8
7
6
Health
Education
Food
Government
Job Sector
Low Income
High Income
C
Sincere Desire to Help
8
7
6
5
Health
Education
Food
Government
Job Sector
D
Valuable to Covid-19 Response
10
9
8
7
6
Health
Education
Food
Government
Job Sector
Low Income
High Income