



Social cure, what social cure? The propensity to underestimate the importance of social factors for health



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ABSTRACT

Rationale: Recent meta-analytic research indicates that social support and social integration are highly protective against mortality, and that their importance is comparable to, or exceeds, that of many established behavioural risks such as smoking, high alcohol consumption, lack of exercise, and obesity that are the traditional focus of medical research (Holt-Lunstad et al., 2010). The present study examines perceptions of the contribution of these various factors to life expectancy within the community at large.

Method: American and British community respondents ($N = 502$) completed an on-line survey assessing the perceived importance of social and behavioural risk factors for mortality.

Results: As hypothesized, while respondents' perceptions of the importance of established behavioural risks was positively and highly correlated with their actual importance, social factors were seen to be far less important for health than they actually are. As a result, overall, there was a small but significant negative correlation between the perceived benefits and the actual benefits of different social and behavioural factors. Men, younger participants, and participants with a lower level of education were more likely to underestimate the importance of social factors for health. There was also evidence that underestimation was predicted by a cluster of ideological factors, the most significant of which was respondents' respect for prevailing convention and authorities as captured by Right-Wing Authoritarianism.

Conclusion: Findings suggest that while people generally underestimate the importance of social factors for health this also varies as a function of demographic and ideological factors. They point to a range of challenges confronting those who seek to promote greater awareness of the importance of social factors for health.

1. Introduction

A medical model that identifies various behavioural risk factors for illness and disease has long informed the way in which we think about health and features prominently in health-related research, policy, and media. Accordingly, when we think about mortality we generally see it as resulting from a range of poor health behaviours such as smoking, high alcohol consumption, lack of exercise, and obesity (Holt-Lunstad et al., 2010). Moreover, within the medical and health sciences, considerable emphasis is placed on the need to reduce the risks associated with these factors (e.g., through prevention, medication, and behaviour change) with a view to reducing the burden of disease on individuals and society.

In recent years, however, a growing body of research has started to explore the social determinants of health (e.g., Jetten et al., 2012; Marmot, 2015; Raphael, 2006). There are at least two distinct strands to

this work. The first, 'health gap' strand, points to the importance of the structural conditions in which people live — especially the levels of poverty, inequality, and social capital within a given community — for a range of negative health outcomes (e.g., Herian et al., 2014; Marmot, 2015; Putnam, 2000; Wilkinson and Pickett, 2010). The second, 'social cure' strand, draws attention to the ways in which a person's social relationships, social networks, social support and other social identity-based resources feed into health outcomes (Cacioppo and Patrick, 2008; Cruwys et al., 2013; Haslam et al., 2014, 2018; Holt-Lunstad et al., 2010; Jetten et al., 2012).

As we will discuss further below, these two strands of research both point to the fact that social factors play a role in shaping health outcomes that is at least as large — and often appreciably larger — than that of poor health behaviour. Not least, this is because these social factors have a significant role to play in shaping health behaviour (e.g., Sani et al., 2015). Nevertheless, in discussing this evidence, researchers

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routinely observe that these social factors are excluded from the menu of risks that medical practitioners and policy makers present to the general public when informing them about pathways to better health (Holt-Lunstad et al., 2010; Marmot, 2015). Accordingly, their research is motivated, at least in part, by a desire to give social factors a more prominent place on the research and policy agenda in order to promote a more accurate understanding of existing evidence. In part, this observation is seen as a question of shaping the thinking of practitioners, policy makers, and fellow researchers, but in part too it is also seen as a matter of changing the mindset of the general public.

Yet this observation raises two important questions. The first concerns the degree to which the views of the public are actually at odds with the conclusions of health gap and social cure research. That is, *to what extent are members of the general public inclined to underestimate the importance of social (vs. behavioural) factors for health?* If, as researchers tend to assume, the answer is that the extent of this underestimation is considerable, then there is a second question — *why* is it the case? Amongst other things, answers to this question would seem to be crucial for efforts to promote an informed public debate around health. These, then, are the two key questions that the present research seeks to address.

1.1. Importance of the social determinants of health

In the last two decades an extensive literature has developed to document the effect of various social factors on health and mortality (e.g., Holt-Lunstad and Smith, 2012; Jetten et al., 2012; Marmot, 2015; Wilkinson and Marmot, 2003). In particular, dozens of studies have observed significant links between a person's social circumstances and their mortality. For example, in an influential early study that summarised the findings of five prospective studies, House et al. (1988) found a lack of social relationships, and associated social isolation, to be major risk factors for health. In particular, less socially integrated individuals were less healthy, both psychologically and physically, than their integrated counterparts and likely to die far sooner. Moreover, the researchers noted that paucity of social relationships posed a health risk that was comparable to well-established and more widely discussed risk factors such as smoking, obesity, physical inactivity, and high blood pressure.

These are conclusions that have subsequently been supported by a broad body of empirical evidence that has accumulated across a range of disciplines — notably epidemiology, sociology, and psychology (e.g., for reviews see Berkman et al., 2000; Cacioppo and Patrick, 2008; Cohen and Wills, 1985; Cruwys et al., 2014; Johnson and Acabchuk, 2017; Putnam, 2000; Sani, 2012; Syme and Berkman, 1976). Yet probably the clearest and most comprehensive support for House and colleagues' (1988) conclusions emerges from an influential meta-analysis reported by Holt-Lunstad et al. (2010; see also Holt-Lunstad et al., 2015). It integrated findings from 148 studies involving over 300,000 participants in which there was quantitative data regarding individuals' mortality as a function of social factors (excluding studies in which mortality resulted from suicide or injury). The resultant analysis identified odds-ratios of reduced mortality associated with two key social factors: *social integration* (encompassing structural measures of social networks in addition to other measures such as marital status, network size and social participation); and *social support* (encompassing functional measures of loneliness and perceived support from others). In both cases these ratios were indicative of quite large effect sizes ($ORs = 0.63, 0.62$, respectively). Importantly, Holt-Lunstad and colleagues then went on to compare the effect of these social factors to that of the nine most important behavioural risk factors previously documented in the research literature. Tellingly, all of these were associated with lower odds ratios: not smoking ($OR = 0.53$), quitting smoking ($OR = 0.50$), low alcohol consumption ($OR = 0.32$), having flu vaccination ($OR = 0.25$), receiving cardiac rehabilitation/exercise ($OR = 0.23$), being physically active ($OR = 0.23$), not being obese

($OR = 0.21$), receiving drug treatment for hypertension ($OR = 0.13$), and not being exposed to air pollution ($OR = 0.06$).

These data thus indicate that social factors are at least as important for mortality as well-established behavioural risks. Significantly too, the researchers note that the results they obtained remain stable when controlling for a range of demographic factors, including age, gender, initial health status, follow-up period, and cause of death. It suggests that the patterns they observe are not specific to particular subgroups (e.g., those who are older or who are already unwell).

1.2. The importance of ideology

Yet despite an abundance of evidence that speaks to the importance of social factors for health, a range of commentators have noted that they are not central to dominant societal understandings of the subject (Haslam et al., 2018; Holt-Lunstad et al., 2010; Marmot, 2015). As things stand, though, this observation is only relatively informal. Moreover, as noted above, to the extent that it is true (something we seek to establish), it is not clear *why* people might be inclined to neglect the social determinants of health.

One obvious answer to this question is that people tend to overlook the importance of the social determinants of health for the simple reason that they have not been told about them. This answer is in stark contrast to their experience of established behavioural risks which are the focus of a range of high-profile public awareness campaigns designed, *inter alia*, to encourage them to quit smoking, reduce alcohol consumption, exercise regularly, and eat well. One reason for this is that it is not necessarily clear precisely what form advice to harness the curative power of social support and social integration should take (Kaufman et al., 2014; see Haslam et al., 2018; for a discussion).

At the same time, though, it is apparent that decisions to disseminate (and to fund the dissemination of) particular forms of health information are not made in a vacuum (Raphael, 2006). Instead, as a number of social and political theorists have noted, they are underpinned by widely shared *ideologies* that feed into the representation of good (and poor) health and that often have limited anchoring in relevant scientific data (e.g., Bambra et al., 2005; Navarro, 2007). As one of the conservative health ministers interviewed by Baum et al. (2013, p.141) put it, “Evidence is a lovely idea but it's got to actually fit with the direction or the trendy issues of the time or the direction of the government at the time”.

Here a critical counterpoint to evidence of the importance of the social determinants of health is provided by ideologies that are endorsed by certain sections of the medical profession and its supporters (e.g., lobbyists aligned with the pharmaceutical industry; Angell, 2005). Apart from anything else, members of these groups generally have a vested financial and professional interest in maintaining an intellectual and physical infrastructure that is grounded in a bio-medical model of health and illness. The desire to see health as a matter of personal responsibility and choice also fits with a conservative agenda that seeks to minimise state involvement in health and that balks at socialised medicine, and which is also often at odds with what is seen as the left-wing agenda of those who emphasise the social determinants (Baum et al., 2013). As Sweet (2013) observes:

Perhaps the major barrier [to belief in the social determinants of health] lies in the kind of health story that dominates the headlines, often reflecting the power of the medical lobby and acute care services, as well as the “lifestyle choices” meme. The chronic health effects of racism, for example, will never command the media attention reserved for hospital waiting lists or medical “breakthroughs”.

Again, though, while analysis of this form is quite broadly endorsed by proponents of the social determinants of health, there is, as yet, little fine-grained analysis of the content of these beliefs and, to our knowledge, no quantitative evidence that they are in any way implicated in

people's understanding of the relative importance of social and behavioural risk factors for mortality.

What form, then, might these ideological influences take? Our answer to this question draws on a large body of social psychological research that has investigated the contribution of ideology both (a) to various forms of prejudice (e.g., Augoustinos and Reynolds, 2001; Duckitt and Sibley, 2007) and (b) to the process of health management (e.g., Libo, 1957; Tones, 1986). In particular, this literature points to the potential relevance of four variables: Anti-Psychosocial Health Beliefs, Right-Wing Authoritarianism, Social Dominance Orientation, and Belief in Biological Essentialism. For reasons that we briefly outline below, each of these might be expected to be implicated in underestimation of the importance of social factors for health.

Anti-Psychosocial Health Beliefs (APHB). A number of studies have examined how the beliefs that health professionals hold about the importance of (social) psychological factors for health can affect treatment trajectories (e.g., Ashworth et al., 1984; Levinson and Roter, 1995; Salmon et al., 2007). In particular, research has found that practitioners who believe that the psychosocial dimensions of health are important tend to pay more attention to them in their treatment than those who do not and to have more collaborative relationships with their patients (Levinson and Roter, 1995; Salmon et al., 2007). In the community at large too, it seems likely that the less a person believes that health practitioners should be attentive to psychosocial factors the less important they will see social factors to be in predicting mortality.

Right-Wing Authoritarianism (RWA). As outlined by Altemeyer (1996), RWA is characterised by a person's authoritarian submission, aggression, and conventionalism. More specifically, those who display high levels of this construct are inclined (a) to recognize established and legitimate authorities in society, (b) to submit to those authorities' will, and (c) to follow social conventions (Duckitt and Sibley, 2007). Because the medical profession is an established institution that is the source of a set of widely respected norms, values, and practices (Hall et al., 2001), we might therefore expect that those who are high in RWA will be more likely to embrace conventional medical wisdom and see health as having primarily behavioural (rather than social) origins. Indeed, a belief in the social determinants of health might be highly threatening for those who see medicine (and medical structures) as an important source of authority not only in the domain of health, but in society at large.

Social Dominance Orientation (SDO). SDO relates to an individual's desire to maintain differences in status between groups, and reflects a belief that it is natural and right for powerful groups to dominate weaker groups (Sidanius and Pratto, 2001). To the extent that a person is high in social dominance they are generally found to favour hierarchy-enhancing ideologies and policies. Again, then, because much of the work on the social determinants of health is specifically oriented to redressing problems of inequality, one might imagine that this view would be particularly unappealing to those who are high in SDO.

Belief in Biological Essentialism (BBE). People who hold essentialist worldviews believe social categories and attributes reflect fixed person-defining essences (Gelman, 2003). When it comes to a person's health, it, too, can be construed in more or less essentialist terms (Bastian and Haslam, 2006). In particular, people vary in the degree to which they see health primarily as a matter of a biological and genetic essence that dictates whether a person is 'healthy' or 'unhealthy' (rather than as something that is inherently variable and influenced by factors other than biology and genes; Dar-Nimrod and Heine, 2011; Levy et al., 2001). Because a belief in the social determinants sees health as something that is structured by social context it therefore follows that to the extent that a person is high in BBE, they should be unlikely to see social factors as important for mortality.

1.3. The present research

As noted above, the first goal of the present research is to establish *whether* people underestimate the importance of social factors for health and, if so, to what extent. In line with these prevailing assumptions our primary hypothesis is as follows:

H1. People will generally underestimate the importance of the social determinants of health.

Further, we are interested in the question of *why* people might underestimate the importance of social determinants of health. In line with the reasoning outlined above, here we tested four inter-related exploratory hypotheses concerning the potential for ideological factors to contribute to this pattern:

H2. Underestimation of the importance of the social determinants of health will be predicted by (a) Anti-Psychosocial Health Beliefs (APHB), (b) Right-Wing Authoritarianism (RWA), (c) Social Dominance Orientation (SDO), and (d) Belief in Biological Essentialism (BBE).

In light of previous research (e.g., Wilson and Sibley, 2013) we also expect APHB, RWA, SDO, and BBE to be inter-correlated, and hence we also explore a more general model of which these hypotheses are constituent parts. This model is represented schematically in Fig. 1.

Our study tested these hypotheses in a sample of participants drawn from on-line communities in the US and UK — Amazon's Mechanical Turk (MTurk) and Prolific Academic (in line with principles laid out by Mason and Suri, 2011). In previous research the quality of data drawn from these sources has been found to meet or exceed psychometric standards for published research across varying compensation rates and survey lengths (Buhrmester et al., 2011). That said, one of the main perceived risks associated with using MTurk respondents is that they will tend to provide relatively invariant responses (i.e., generating data that is insufficiently differentiated across constructs; Goodman et al., 2013). Nevertheless, in the present context, we reasoned that any tendency for participants to give similar responses to every question would work against our predictions and therefore provide a conservative test of our hypotheses.

2. Method

2.1. Participants

Five hundred and two participants were recruited from MTurk ($N = 250$) and Prolific Academic ($N = 252$) in July 2017. In line with evidence that crowd sourcing platforms provide access to demographically diverse samples, there was considerable variability in

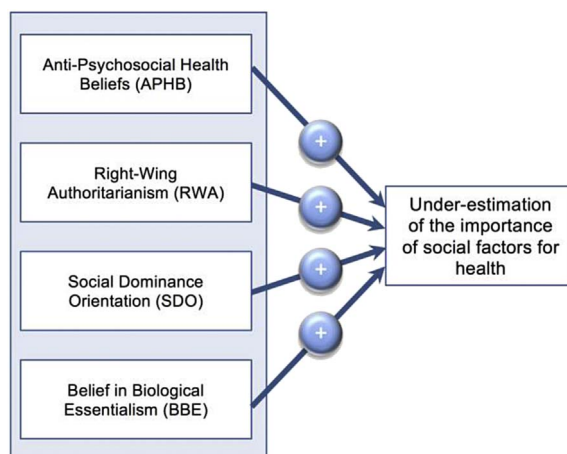


Fig. 1. Model of exploratory hypotheses pertaining to the relationship between ideology and the underestimation of social determinants of health.

respondents' age (from 18 to 72 years; $M = 36.46$; $SD = 11.76$), sex (44.4% were male, 55.6% were female), and highest level of educational achievement (1% Junior School or below, 2% Junior/Secondary school, 23% School/Secondary Technical, 15% College Degree, 42% Bachelor Degree, 14% Masters Degree, and 2% Doctoral Degree).

2.2. Survey instrument

Participants completed a survey that contained the following six subsections:

1. Perceived Determinants of Health (PDoH). This measure first asked participants to rank the 11 factors discussed by Holt-Lunstad et al. (2010; e.g., “receiving social support” and “quitting smoking”) in terms of their importance for health (from the most important to the least important). Participants were then asked to indicate how many years (between 0 and 20) they believed each factor would add to a typical person's life expectancy (assuming a life expectancy of 80 years). The order in which the factors were presented was randomised for each participant.

2. Anti-Psychosocial Health Beliefs (APHB). This measure included 12 items relating to beliefs about the importance that health professionals should attach to the psychosocial dimensions of health (e.g., “Health professionals should not be concerned about psychosocial problems”; “Talking about psychological issues is more trouble than it is worth”; adapted from Ashworth et al., 1984). The scale was prefaced by a rubric which explained that “Psychosocial problems are those that have a psychological and/or social origin (e.g., stress, divorce, poverty), as distinct from those that have a medical origin (e.g., genetics, physiological dysfunction, disease)”. As with the RWA and SDO scales below, participants indicated the extent to which they agreed with each item on 7-point Likert scales ranging from 1 (*strongly disagree*) to 7 (*strongly agree*).

3. Right-Wing Authoritarianism (RWA). A short version of Altemeyer's RWA scale (as used by Reicher and Haslam, 2006) asked participants to respond to eight items (e.g., “Things would go better if people talked less and worked harder”, “People should always comply with the decision of the majority”). A control question — stating “this is a control question please select ‘agree’” — was also included on the RWA and SDO scales to check that participants were processing item content carefully.

4. Social Dominance Orientation (SDO). The short-version of SDO (again, as used by Reicher and Haslam, 2006) asked participants to respond to four statements (two of which were reverse-scored) (e.g., “Superior groups should dominate inferior groups”. “We should not push for group equality”).

5. Belief in Biological Essentialism (BBE). Participants indicated their agreement with four statements taken from Bastian and Haslam's (2006) eight-item Biological Basis of essentialism scale (e.g., “Very few traits that people exhibit can be traced back to their biology”, “Whether someone is one kind of person or another is determined by their biological make-up”). Responses were provided on 6-point Likert scales and two of the items were reverse scored.

6. Control variables. At the end of the survey, participants were asked to indicate their age, gender, and highest level of education (where 1 = junior school, 7 = doctoral degree). They were also asked to respond to three questions about their current health status: (a) How would you rate your physical health? (from 1 ‘poor’ to 5 ‘excellent’; DeSalvo et al., 2006), (b) How often have you accessed the services of medical professionals in the past five years?, and (c) How often have members of your family accessed the services of medical professionals in the past five years? Responses on the last two measures were made on scales ranging from 1 (very rarely) to 5 (very frequently).

2.3. Procedure

The study was given ethical clearance by the Ethical Review Board

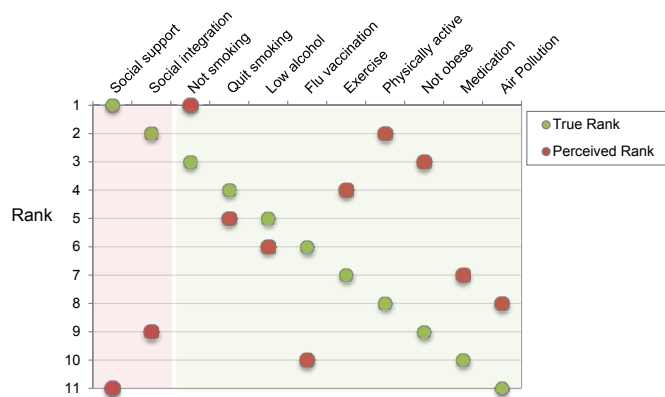


Fig. 2. Plot of rankings of the perceived importance of social and behavioural risk factors for health against actual rankings reported by Holt-Lunstad et al. (2010).

at the authors' university. Participants were paid US\$1 for signing up to complete the survey and before they did so they were given a brief overview of what would be required of them. They were informed that completing the survey was voluntary, that their responses would be anonymous, and were asked to give their consent to participate, which all did. Participants took around 15 min to complete the survey. They then received debriefing information, including a summary of Holt-Lunstad et al.'s (2010) findings.

3. Results

3.1. Tests of primary hypothesis

Rankings of the perceived importance of all factors included in the PDoH measure are plotted together with the rankings reported by Holt-Lunstad et al. (2010) in Fig. 2. Mean estimates of the contribution that different factors made to life expectancy are plotted together with odds-ratios reported by Holt-Lunstad et al. (2010) in Fig. 3. From these graphs it can be seen that, in line with our primary hypothesis, participants underestimated the importance of the social determinants of health as evidenced by the fact that social support and social integration were ranked as two of the three least important factors for health and perceived to be two of the three factors making the smallest contribution to life expectancy. Indeed, on average, the nine behavioural risk factors were each seen as adding 10.33 years to life expectancy, but the two social factors were each seen to add only 5.98 years, $t(479) = 23.17, p < .001$. The consequence was that, overall, there were small negative correlations between the mean perceived ranking of each factor and its actual ranking ($\rho(9) = -0.22$), and between the mean perceived and actual contribution of each factor to life

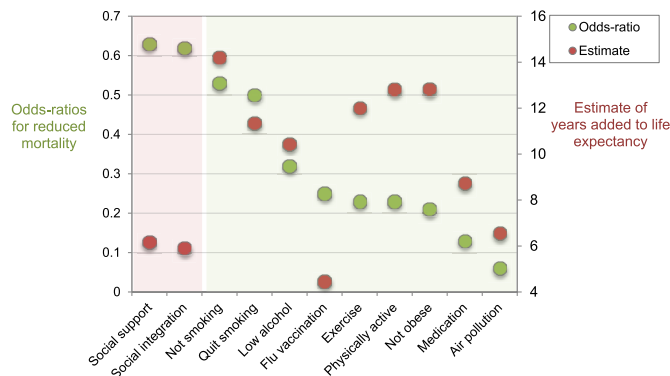


Fig. 3. Plot of mean estimates of the contribution of social and behavioural risk factors to life expectancy and odds ratios of reduced mortality associated with these factors as reported by Holt-Lunstad et al. (2010).

expectancy ($r(9) = -0.06$).

To explore individual-level patterning in the accuracy of rankings and estimations of the importance of the different factors for health, two correlations were computed for each participant. The first of these accuracy indices was the rank correlation (Spearman's ρ) between individuals' rankings of the importance of each factor and ranking data abstracted from Holt-Lunstad et al. (2010). The second accuracy index was the correlation (r) between individuals' estimates of the contributions of each factor to life expectancy and the odds ratios reported by Holt-Lunstad et al. (2010). To explore patterns of response variance, we also examined the distribution of participants' estimates of the contributions of each of the 11 factors to life expectancy, which suggested that variance in responses was normally distributed and hence that there was no evidence of problematic levels of response invariance in the data (skewness = 0.95, SE = 0.11; kurtosis = -0.44, SE = 0.22; Kolmogorov-Smirnov $D = 0.03$, $p = .20$; Shapiro-Wilks $W = 0.99$, $p = .12$).

In line with H1, analysis again showed that, on average, there were small negative correlations between perceived and actual rankings ($M_p = -0.09$, $SD = 0.25$) and between perceived and actual contributions to life expectancy ($M_r = -0.05$, $SD = 0.27$). One-sample t -tests compared the resultant correlation coefficients with a value of zero and indicated that, on average, these coefficients were both significantly smaller than zero: $t_{rankings(501)} = -8.36$, $p < .001$; $t_{estimates(501)} = -4.38$, $p < .001$.

To explore the source of the inaccuracy in participants' rankings and estimates, additional analyses were performed including only rankings and estimates of the nine behavioural factors discussed by Holt-Lunstad et al. (2010; i.e., excluding the two social factors). At the level of the sample as a whole, perceived and actual rankings were positive and moderately sized (Spearman's $\rho(7) = 0.35$) and perceived and actual estimates of contributions to life expectancy ($r(7) = 0.52$). At the individual level, these positive correlations were also of moderate size (rankings: $M_p = 0.27$, $SD = 0.29$; estimates: $M_r = 0.35$, $SD = 0.29$) and significantly greater than zero: $t_{rankings(501)} = 20.63$, $p < .001$; $t_{estimates(501)} = 26.44$, $p < .001$.

In sum, then, participants were quite accurate when estimating the contribution of behavioural risk factors (the green shaded area of Figs. 2 and 3), but their accuracy diminished — to the point that they became slightly but significantly inaccurate — once their estimations also encompassed the social determinants of health (the pink shaded area of Figs. 2 and 3).

3.2. Tests of exploratory hypotheses

In order to examine the potential underpinnings of support for our primary hypothesis, an integrated accuracy index was created by averaging the first and second accuracy indices (i.e., those relating to factor rankings and estimates of factors' contribution to life expectancy). Scales were constructed for each of the four ideological constructs assessed in the survey. All had good reliability (APHB $\alpha = 0.77$, RWA $\alpha = 0.81$, SDO $\alpha = 0.83$, BBE $\alpha = 0.81$). Bivariate correlations between the integrated accuracy index and control and ideological variables are presented in Table 1. Thus, it can be seen that, as expected, all the ideological variables were highly correlated with each other, with the exception of SDO and BBE.

Hierarchical multiple regression was then conducted to model the accuracy of participants' estimates of the importance of behavioural and social factors for health (35 participants were removed from this analysis due to missing data), which involved entering participants' (a) nationality, age, level of education, and gender into the model at Step 1, (b) their physical health and use of medical services, and their family's use of medical services at Step 2, and then (c) the four ideological variables (APHB, RWA, SDO, BBE) at Step 3. At every step in the model, tests suggested that there were non-problematic levels of collinearity present (Step 1: min Tolerance = 0.97, max VIF = 1.03; Step 2: min

Tolerance = 0.89, max VIF = 1.03; Step 3: min Tolerance = 0.68, max VIF = 1.60).

As can be seen from the results presented in Table 2, the control variables entered at Step 1 accounted for a significant amount (4.2%) of the variance in the underestimation of the impact of social factors on health, $F_{ch}(4,469) = 5.12$, $p < .001$. Follow-up analysis indicated that of those variables included in the regression model, participants' age, gender and level of education were all significant predictors — with men, younger participants, and participants with a lower level of education, all being more likely to underestimate the importance of social factors for health.

The second set of health control variables entered at Step 2 made a non-significant contribution to the model (accounting for 0.0% of the variance), $F_{ch}(3,466) = 0.05$, $p = .98$. However, in line with our exploratory hypotheses, the ideological variables entered at Step 3 did make a significant contribution — accounting for 2.6% of the variance in accuracy, $F_{ch}(4,462) = 3.20$, $p = .01$. Nevertheless, more fine-grained follow-up analyses to interrogate the nature of this contribution indicated that RWA was the only ideological measure to account for significant variance in accuracy. Participants who were higher in RWA were more likely to underestimate the importance of social factors for health.

4. Discussion

In recent years a broad literature has developed pointing to the importance of social factors for health and decreased mortality. Here one strand of 'health gap' research has pointed to the ways in which various forms of inequality contribute to poor health outcomes (e.g., Marmot, 2015; Syme and Berkman, 1976; Wilkinson and Pickett, 2010), while another 'social cure' strand has pointed to ways in which group-based processes of social support and social integration contribute to positive health outcomes (e.g., Haslam et al., 2018; Jetten et al., 2012; Holt-Lunstad et al., 2010; House et al., 1988). This work has generated some compelling findings, but probably the most persuasive evidence comes from studies which show that these social variables are at least as important as behavioural risk factors — if not more so — when it comes to predicting mortality (Holt-Lunstad et al., 2010; Putnam, 2000; Steffens et al., 2016).

As in other areas of science where researchers are motivated by a desire to push back the frontiers of ignorance, it would appear that one of the drivers of this growing body of research is an assumption that people tend generally to underestimate the importance of social factors for health. For example, in discussing the implications of their meta-analysis, Holt-Lunstad et al. (2010, p.14), remark:

Physicians, health professionals, educators, and the public media take risk factors such as smoking, diet, and exercise seriously; the data presented here make a compelling case for social relationship factors to be added to that list.

The implication here, then, is that social factors are not already 'on the list'. However, this assumption has, to our knowledge, has never been tested directly. The first goal of the present research was to perform this test and thereby gauge how serious the knowledge deficit pertaining to the social determinants of health actually is.

On the basis of crowd-sourced data collected in the United States and the United Kingdom, the present study provides clear evidence that members of the public underestimate the importance of social factors for health. This pattern is seen most baldly in the fact that the two social factors discussed by Holt-Lunstad et al. (2010) are seen to make a contribution to life expectancy that is roughly half that of the behavioural risk factors they identify, whereas the data these researchers present shows that, on average, the contribution of the social factors is actually around double that of the behavioural risk factors. More specifically, in line with our primary hypothesis, there were small but significant negative correlations (a) between respondents' rankings of

Table 1
Bivariate correlations between accurate estimation of the contribution of social and behavioural risk factors to health, demographic, and ideological variables.

Variable	Scale range	Mean	SD	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Accurate estimation	-1 - +1	-0.07	0.19											
2. Nationality	1 = USA, 2 = UK			0.07										
3. Age	(18–72)	36.46	11.76	0.10*	0.13**									
4. Education	1–7	4.47	1.18	0.09*	0.00	0.00								
5. Gender	1 = M, 2 = F			0.14*	0.09*	0.09*	-0.05							
6. Health	1–5	3.12	0.90	0.00	-0.15**	-0.04	0.12**	-0.07						
7. Own use of medical services	1–5	2.53	1.08	0.04	-0.10*	0.03	0.01	0.14**	-0.23**					
8. Family use of medical services	1–5	2.95	1.49	-0.01	0.09	-0.07	-0.12	-0.01	-0.05	-0.11*				
9. Anti-psychosocial Health Beliefs (APHB)	1–7	3.19	0.73	-0.13**	-0.25**	-0.29	0.07	-0.21	0.09*	-0.10*	-0.04			
10. Right-Wing Authoritarianism (RWA)	1–7	3.42	1.03	-0.19**	-0.22**	-0.10*	-0.04	-0.11*	0.12*	-0.01	0.01	0.50**		
11. Social Dominance Orientation (SDO)	1–7	2.52	1.20	-0.03	0.04	0.10*	0.02	-0.14**	0.06	0.00	-0.03	0.25**	0.31**	
12. Belief in Biological Essentialism (BBE)	1–6	3.44	1.00	-0.01	-0.07	-0.01	0.07	0.02	0.11*	0.10*	0.01	0.22**	0.37**	0.07

Note: **p* < .05, ***p* < .01.

Table 2
Results of hierarchical multiple regression analysis to model accurate estimation of the contribution of social and behavioural risk factors to health (*N* = 466).

Step	Variable	Δ <i>R</i> ²	β _{Step1}	β _{Step2}	β _{Step3}
1		0.04**			
	Nationality		0.04	0.05	0.00
	Age		0.10*	0.10*	0.09
	Level of education		0.11*	0.11*	0.10*
2		0.00			
	Gender		0.12**	0.12**	0.11*
	Physical health			0.00	0.01
3		0.03*			
	Access to medical services			0.01	0.00
	Family access to medical services			-0.01	-0.01
	APHB				-0.05
	RWA				-0.16**
	SDO				0.04
					0.05

Note: **p* < .05, ***p* < .01.

the importance of social factors and behavioural risk factors for life expectancy as discussed by Holt-Lunstad et al. (2010) and ranking data abstracted from their meta-analysis and (b) between respondents' estimates of the contributions of each of these factors to life expectancy and corresponding odds ratios reported by Holt-Lunstad et al. (2010). Furthermore, there was evidence that this knowledge deficit was specific to social factors as further analysis showed that when it came to ranking and estimating the importance of behavioural risk factors alone there were moderately high positive relationships (a) between respondents' rankings of the importance of these factors for mortality and the data presented by Holt-Lunstad et al. (2010), and (b) between their estimates of the contributions of each of these factors to life expectancy and corresponding odds ratios. In simple terms, then, people seem generally to be quite good at estimating the relative importance of different behavioural risk factors, but extremely poor at doing the same for social factors.

The obvious question that this evidence raises is *why* people underestimate the importance of the social determinants of health. Here our review of the relevant social psychological literature led us to develop exploratory hypotheses related to the role that ideological factors might play in this process (e.g., as suggested by Bambra et al., 2005; Navarro, 2007). In particular, we hypothesized that underestimation of the importance of social factors might be associated with (a) beliefs which tend to marginalize the importance of psychosocial factors for health, (b) Right-Wing Authoritarianism, which leads people to recognize and submit to established authorities and convention, (c) Social Dominance Orientation, which motivates people to reinforce social inequality, or (d) belief in biological essentialism, which sees health as biologically (and, in particular, genetically) determined rather than as something that is shaped by social context.

In line with this hypothesis, analysis showed that these four variables were quite highly inter-correlated and that, when entered together as predictors in the model, they did indeed account for a significant amount of variance when modelling respondents' inaccuracy. Nevertheless, more fine-grained analysis indicated that Right-Wing Authoritarianism was the only unique predictor of the tendency to downplay the importance of social factors for health, which suggests that, at least in part, this tendency is reflective of a worldview that centres on conservative respect for convention and for the authorities who uphold it (Altemeyer, 1996).

It should be noted too that the above patterns hold when controlling both (a) for age, gender and nationality, and (b) for people's level of contact with the medical profession. Nevertheless, it was also apparent that participants' gender, age and level of education all emerged as independent predictors of inaccuracy, with those who were women, older and more highly educated being less likely to underestimate the importance of social factors for health. One plausible explanation for these patterns is that insight into the importance of social factors for health is acquired through particular forms of life experience (e.g., as a mother, as a student). Relatedly, it is also possible that these patterns reflect the fact that men and people with less formal education are particularly unresponsive to the messages of social scientists because they see these as "distant, cold and abstract" communications from an outgroup (Westen, 2010, p.32). Whatever the reasons, it is worth noting that the challenges of engaging people with social scientific health agendas may be particularly pronounced when dealing with members of these groups.

4.1. Implications

The first and most obvious implication of these findings is that they suggest that researchers have been correct to assume that awareness of the importance of social factors for health — specifically, of the curative role played by social support and social integration — is limited. Thus, while research like that of Holt-Lunstad et al. (2010) places these factors at the top of a list of factors that stave off death, members of the public tend to place them at the bottom. At the very least, then, there may be much more that needs to be done if the findings of this literature are to be translated into the received wisdom and cherished practice of the person on the street.

At one level, of course, this translational task can be seen to be an educational one. Indeed, in light of the fact that inaccuracy is predicted by a person's age and level of education, it is tempting to see the way forward as centring primarily on the significant challenge of ensuring that people receive better education and are exposed to scientific communication of the highest quality. Yet while these are certainly sensible and laudable goals — especially for men (given that they are more likely than women to downplay the importance of social factors for health) — the present data also point to the fact that the obstacles to

progress are not simply information-based, but also, at least in part, ideological and political. This much is intimated, for example, by the response of one of the conservative government ministers interviewed by Baum et al. (2013, pp.141–142) when he observed:

I think you know, public health is not enormously practical and, yes, there's this great world movement on social determinants of health but, you know, to what end? We're all going to have a Swedish social democracy? I don't think so.

Speaking more specifically to this issue, our findings suggest that a cluster of ideological variables is associated with the tendency for people to downplay the importance of social factors for health. Principal amongst these is deference to societal convention and to the authorities that uphold it as assessed by RWA. Indeed, insofar as the medical profession — and the intellectual and material apparatus that supports it — is one of the last bastions of convention in the western world today (but nevertheless one whose hold on power is less secure than it was; Coburn and Willis, 2000), it seems reasonable to suppose that work which appears to challenge its authority and push for social change to the established order has the potential to be seen as quite threatening.

To the extent that this is the case, it would therefore seem that researchers who are interested in advancing awareness of the potency of the social determinants of health — and shaping policy and practice around this awareness — need not only to make their case as scientifically robust as possible but also to be aware of the various forms of identity threat that their work invokes and to formulate strategies that engage optimally with this in the context of prevailing structural realities (e.g., in ways discussed by Tajfel and Turner, 1979). This point emerges clearly from research by Westen (2010) which exposes the limited receptivity of the general public to messages about the social determinants of health, and the need for scientific communication to be couched in terms that make the issues this literature raises a problem for “us” rather than for “them.”

4.2. Limitations and directions for future research

As with all research — especially that which makes the first attempt to grapple with a challenging measurement problem — this research is not without limitations. In the present case, three of these stand out.

The first relates to our choice of participants, as a number of commentators have questioned the representativeness of samples drawn from on-line communities as well as the quality of the data they produce (e.g., Goodman, et al., 2013). In the present case, we feel these concerns are assuaged by the fact that (a) our sample proved to be quite representative of the general population in the countries where data were gathered (e.g., in terms of age, level of education, and ideology) and (b) any tendency for participants to make undifferentiated responses would tend to have worked against our hypotheses. In particular, the pattern of effects that led to support for H1 and H2 could not have been produced by invariant or random responding. It is also the case that there was no evidence of problematic response invariance in our data.

A second concern relates to the indices that we developed to assess respondents' accuracy. In particular, one could argue that the decision to base these on data provided by Holt-Lunstad et al. (2010) is rather arbitrary, and that it is misleading to represent these data as constituting the single truth against which to gauge accuracy. While it is certainly the case that one could point to other studies which would provide an alternative baseline, we would defend our choice on the grounds that Holt-Lunstad et al.'s review can be seen to provide the most comprehensive analysis of the importance of various social and behavioural predictors for health that is presently available. That said, we recognize that this point is debatable and may change in future, and therefore see the value of future research to test our hypotheses with reference to alternative indices of accuracy.

A third and final limitation is that, because our data are correlational, they do not allow us to draw causal inferences about the nature of the relationships we have observed. This concern has no bearing on H1 but it means that we are not in a position to conclude that ideological beliefs *cause* people to underestimate the importance of social factors for health. We would note, however, that these are not the types of inferences that we were seeking to draw from this research. Instead, our goal was simply to show that the tendency to underestimate the importance of social factors for health has a political and ideological *dimension*. One aspect of this, it appears, is that people who support convention and authority are more likely to explain health outcomes by reproducing the conventional wisdom of medical authorities (Haslam et al., 2018).

Nevertheless, there are undoubtedly other important dimensions to this phenomenon that would also be good to explore. These include the role played by (a) *exposure* to the biomedical model of illness (e.g., in public health campaigns) and (b) the *absence of exposure* to information about the importance of social integration and social support for health (in part a reflection of the fact that it is unclear what relevant guidelines might look like). Indeed, in future research, it would be particularly interesting to investigate whether exposure to information about the importance of social factors for health changes people's attitudes and behaviour, and whether this change is itself moderated by ideology, demographics, and access to social resources.

4.3. Concluding comment

In Greek mythology, Cassandra, the daughter of Priam and Hecuba, was cursed to have the power of prophecy coupled with an incapacity to make others believe her. The bittersweet conclusion of the present paper speaks to a similar curse that can be seen to have befallen those who advocate for greater recognition of the importance of social factors for health. For while the quality of their research is not in doubt, it would appear that the truths it sets out are still foreign to members of society at large. Hitherto this conclusion was only an assumption, but our research confirms that researchers in health gap and social cure traditions were correct to have anticipated that people generally underestimate the importance of social life for health.

Having provided evidence of this knowledge deficit, the obvious question that this research leaves unanswered is how this scientific Cassandra complex might be overcome. One answer is simply to conduct more high-quality science and engage in more high-quality scientific communication. However, evidence that this knowledge deficit has underpinnings that are partly ideological suggests that this strategy alone is unlikely to win the day. Indeed, the fact that politics is part of the problem, suggests that it must necessarily also be part of any solution (Haslam, 2014). Being willing to apply ourselves to the task of making political, not just scientific, progress, would therefore seem to be critical not just to acknowledgement of the social cure but also to its delivery. How precisely we should do so must now surely be seen as an important research question in its own right.

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