Identity change, uncertainty and mistrust in relation to fear and risk of COVID-19

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Abstract

The COVID-19 pandemic produced threats not only to physical and psychological health but also to the very fabric of family, work and social life. Individuals differ markedly in their ability to cope with such threats. Drawing on Identity Process Theory, our study examines identity processes that shape emotional and attitudinal responses to COVID-19. Survey data were collected from 251 adults in the UK during July 2020. Identity resilience, trust in science and scientists, fear of COVID-19 and perceived own risk of infection were measured. Respondents then watched a video clip designed to focus their thinking further upon the disease. Immediately after, levels of feeling afraid, uncertainty about self-protection, mistrust of anyone offering COVID-19 advice, and perceptions of identity change were indexed. A structural equation model of the relationship between these variables was tested and proved a good fit for the data. Identity resilience is negatively related to fear of COVID-19, which in turn is positively related to perceived own risk of COVID-19. Higher identity resilience is associated with greater uncertainty and feeling more afraid. Greater identity change is associated with higher mistrust, uncertainty and feeling more afraid. Trust in science and scientists correlates positively with perceived own risk of COVID-19 and negatively with mistrust of those offering advice on preventive behaviour. This study shows the usefulness of the identity resilience concept in modelling responses to health hazards. It also illustrates that focussing, even for a short time, on the characteristics of such a hazard can elicit perceived identity changes. Arousing fear is unlikely to initiate self-protection in those who are already fearful or who have less identity resilience. Fostering greater general trust in science and scientists, though difficult, will be valuable, particularly in encouraging public acceptance of mass vaccination against the virus when misinformation and conspiracy theories about it abound.

Keywords
identity change; identity resilience; uncertainty; mistrust; fear of COVID-19; risk of COVID-19

Introduction

By November 2020, in the UK 1.2 million people had contracted COVID-19 and over 50,000 had died; globally the figures were 52 million infected and 1.3 million fatalities (UK Government, 2020). The COVID-19 global pandemic created not only a great risk to physical health but also required reordering of work and family life, significant change in social behaviour and traumatic emotional upheavals. Each of these comprises a threat to psychological well-being (Lopes & Jaspal, 2020; Rajkumar, 2020; Torales et al., 2020; Wang et al., 2020). Individuals differ in their ability to cope with these threats. Our study examines the identity processes, manifested through identity resilience, that, in part, explain these differences. It is a study in two parts. The first part examines how identity resilience is associated with fear of COVID-19, how that fear is related to perceived personal risk of COVID-19, and how that risk is linked to trust in science and scientists. The second part examines how identity resilience and fear affect uncertainty, mistrust and feeling afraid after

being asked to pay attention to information about COVID-19. It also explores whether individuals feel that aspects of their identity change after thinking about this information.

Identity Resilience

Our study is grounded in Identity Process Theory (IPT) (Breakwell, 2015a; 2015c; 2001) that explicitly focuses upon the strategies that people use to cope with threat. The strategies individuals choose depend on identity processes. IPT proposes that people strive to achieve an identity configuration characterised by self-esteem, self-efficacy, personal continuity, and positive distinctiveness. The person strives to enhance each of these 'identity principles'. Achieving this enhancement can involve many varied types of activity – ranging from the intra-psychic, through the interpersonal, to the group, intergroup, and societal levels (Breakwell, 2015b; Chryssochoou, 2014; Jaspal, 2018; Lyons, 1996). The four aspects are distinct and do not necessarily manifest as highly correlated. For instance, some people have a strong sense their continuity (their sameness over time and place) but have a lesser sense of their self-efficacy (confidence in their own competence). IPT states that the identity configuration at any one time will significantly influence the capacity to cope with threats.

Some recent developments of IPT (Breakwell, 2020a, 2020b) have centred upon the concept of identity resilience. Identity resilience is achieved when individuals perceive that they have high self-esteem, self-efficacy and continuity. Identity resilience is manifested in a belief in one's own capacity to understand and overcome problems, one's self-worth and value, and certainty of who one is and still will be even as the world changes. Identity resilience is associated with having the capacity to maintain a stable sense of self despite threats. Positive distinctiveness is sometimes included in the formal definition of identity resilience. However, its role in determining response to threat is variable, depending on the source of distinctiveness and its relevance to the threat itself. The current standard index of identity resilience does not include it.

Each of the three components of the identity resilience index has been shown individually to be instrumental in shaping reactions to health hazards (e.g.; Arsandaux et al., 2020; Hajek, 2019; Hendy et al., 2006; Schulenberg et al., 2003). However, the significance of overall identity resilience in influencing such reactions has not been established. Our study specifically examines the relationship between identity resilience and fear of COVID-19. Based on earlier work on the three identity principles comprising resilience, we predicted that identity resilience would be negatively related to fear of COVID-19. Understanding influences on fear of COVID-19 is important because fear affects perceptions of personal risk and willingness to follow guidance on infection prevention.

Fear of COVID-19, Perceived Own Risk of COVID-19, and Trust in Science

The threats posed by COVID-19 have demanded behavioural change. Internationally, governments have used both compulsion and persuasion to ensure that their populations change their behaviour to limit the spread of the virus (Waizenegger et al., 2020). In relation to other illnesses, fear has been found to affect how far people will understand and comply with health protection messages (Harper et al., 2020; Miles et al., 2009; Ruiter et al., 2001). Typically, fear levels at either high or low extremes reduce the effectiveness of guidance, leading to inertia, denial, or panic. Moderate levels can motivate constructive adaptation.

COVID-19 has certainly aroused fear (Ahorsu et al., 2020; Pakpour & Griffiths, 2020). Moderate to high levels of fear of COVID-19 are associated with more compliance with preventive behaviour guidelines (Breakwell, Jaspal & Fino, 2020). It is consequently useful to understand the origins of variations in fear of COVID-19. Identity processes have been linked to health fears. Negative self-assessments, especially of self-efficacy and self-esteem, are associated with higher levels of fear of both physical and mental illnesses (see for instance

Collett et al., 2016; Rossi et al., 2020). As a result, we predicted that greater identity resilience would be associated with less fear of COVID-19.

Fear of COVID-19 is positively correlated normally with perceived personal (i.e. one's own) risk of the disease (Jaspal, Fino & Breakwell, 2020). However, the moderate level of their shared variance suggests that they influence each other but are each separately influenced by other factors. Indeed, conceptually the two constructs are distinct. Fear is an emotional response to the hazard. Risk is an assessment of the likelihood of harm and the severity of harm. Both fear and perceived risk are subjective and are dynamically related. It is hard to show empirically which might have causal primacy. Direction of causality probably shifts with context and the specific object of fear and risk. Here we predict that higher identity resilience will be associated with less fear; and less fear with less perceived own risk.

Perceived own risk is also influenced by trust levels in available sources of information about a hazard. Degree of general trust in advice and guidance from scientific authorities has been shown to influence both perception of risks associated with health hazards (Löfstedt, 2013) and credibility of specific recommendations for self-protection (Siegrist et al., 2005). The significance of the perceived trustworthiness of a source is particularly important when the hazard itself is new and has dreadful consequences, as demonstrated in early research into HIV/ AIDS (Goldsteen & Goldsteen, 1990; Herek et al., 1998). Consequently, we predicted that greater trust in science and scientists would result in a higher estimate of own risk of COVID-19. This might seem counter-intuitive. However, at the time of data collection, the scientific establishment had already emphasised the global significance of the risk of COVID-19 and that treatments and vaccines were not yet available. Trusting the science would predispose greater levels of perceived own risk.

Trust in science might also be expected to influence fear of COVID-19. However, we did not predict this in our study. The science messages to the public, while emphasising risk and the need to self-protect, were also designed to reassure and encourage confidence in those dealing with the pandemic. Whether this assuaged fear probably depended on the prior beliefs of the audience. COVID-19 misinformation was rife (Lovari, 2020) and conspiracy theories abounded (Gruzd & Mai, 2020). Thus, the impact of trust in science upon fear levels may have been muted or, indeed, polarised. Greater trust in science is, nevertheless, associated with a higher proclivity to follow COVID-19 prevention guidance (Plohl & Musil, 2020).

Identity Change, Feeling Afraid, Mistrust and Uncertainty

The second part of the study concerned the effects upon identity of presenting, via two short videos, information about the risks of COVID-19 and ways to protect against infection. The information provided was already available and broadcast to the public. Providing this information was designed to ensure that the facts about COVID-19 risks and infection prevention were cognitively salient for respondents. Each respondent saw only one video. We wished to test whether focussing upon self-protection or infection risk had different effects. After seeing the videos, respondents rated how uncertain they were about what they should do to protect themselves, how far they mistrusted people to tell them what to do to protect themselves, and how afraid they were feeling at the time they answered. We predicted trust in science and scientists would be negatively correlated with mistrust, and that fear of COVID-19 would be positively correlated with feeling afraid. We predicted that mistrust and uncertainty would be positively correlated.

Respondents also rated how much they felt the information in the videos had changed the way they thought about aspects of their identity. Identity Process Theory states that identity is constantly developed and maintained by processes of assimilation and accommodation (Bonaiuto, Breakwell & Cano, 1996). Faced with changes in experience that initiate behavioural, cognitive and emotional reactions, these processes will act to adjust the identity

configuration. Identity is continually refreshed. The design of the current study made it possible to examine whether respondents would perceive and report that aspects of their identity were changed following the presentation of COVID-19 related information. It also made it possible to analyse whether identity changes were predicated by feeling afraid, uncertainty and mistrust after receiving the information. We hypothesised that feeling afraid, uncertainty and mistrust would each contribute to raising the likelihood that identity change would be reported.

We also hypothesised that higher levels of pre-existing identity resilience would militate against identity change through its dampening effects upon fear of COVID-19, uncertainty and feeling afraid. In the absence of previous research on their relationship and, given that resilience might result in either trust or mistrust dependent upon prior beliefs, no direct correlation between identity resilience and mistrust was predicted. We did not predict an unmediated link between level of identity resilience and amount of identity change. Identity resilience shapes form and direction of identity change rather than simply amount of identity change. However, we did not measure the form of identity change. We can only predict the mediated effect of identity resilience upon amount of change.

We examined whether initial fear of COVID-19 would be associated with feeling afraid immediately after seeing the presentation and whether feeling afraid was associated with reported change to identity. We predicted that it would be.

Hypotheses

The model we are proposing is presented in Figure 1.

Insert Figure 1 here

The figure reflects our hypotheses:

1. Identity resilience is negatively correlated with fear of COVID-19 and with feeling afraid or uncertain after being asked to focus on information about the disease.
2. Feeling afraid, uncertainty about self-protection and mistrust of sources of self-protection guidance are each positively correlated with amount of identity change reported.
3. Fear of COVID-19 is positively correlated with perceived own risk of COVID-19 and with immediately feeling afraid when asked to focus on the risks or management of the disease.
4. Trust in science and scientists is positively associated with perceived own risk of COVID-19 and negatively correlated with mistrust.
5. Uncertainty and mistrust are positively correlated.

Method

Ethical Approval

Ethical approval was provided by Nottingham Trent University's School of Business, Law and Social Sciences' Ethics Committee (2020/174). Data were provided anonymously. Participants were subsequently debriefed, received information about counselling services in the UK, and paid for their time.

Participants

Two-hundred and fifty-eight participants were recruited through *Prolific*, an online recruitment platform, to complete an online questionnaire on 8 July 2020. They were paid a token amount for participating. There were two main eligibility criteria: (1) being aged 18 or over and (2) being resident in the UK. Data from 7 participants were excluded because they failed one or both of the attention checks in the study, which resulted in a sample of 251 participants. Based

on G*Power recommendations, the sample was considered adequate for the analyses conducted. See Table 1 for a full overview of the socio-demographic characteristics of the participant sample.

Insert Table 1 here

Measures

Demographic Questions

Participants were asked to indicate their age, gender, ethnicity, religion, relationship status, living arrangements, level of education, employment status and income.

Identity Resilience

Identity resilience was indexed using the summed responses to three well-established scales, all of which use 5-point Likert response scales (1=strongly disagree, 5=strongly agree):

- Rosenberg Self-Esteem Scale (Rosenberg, 1965) consisting of 10 items (Sample items: 'I wish I could have more respect for myself' and 'At times I think I am no good at all'). The higher the score, the greater one's self-esteem (α=.86).
- General Self-Efficacy Scale (Schwarzer & Jerusalem, 1995) consisting of 10 items. These included 'I can always manage to solve difficult problems if I try hard enough' and 'If I am in trouble, I can usually think of a solution'. Higher scores indicated greater generalised self-efficacy (α=.91).
- The Self-Continuity Index (Sedikides et al., 2015), which was adapted to measure identity continuity. The adapted scale included 10 items, including 'I feel connected with my past' and 'I will remain the same sort of person in the future'. A higher score indicated higher self-continuity (α=.87).

The composite identity resilience index consisted of 30 items and a higher score indicated greater identity resilience. The scale exhibited excellent internal reliability (α=93).

Fear of COVID-19

The Fear of COVID-19 Scale (Ahorsu et al., 2020) comprising 7 items with responses on a 5-point scale (1=strongly disagree, 5=strongly agree) was used. Items included 'I do not worry much about COVID-19' and 'When I think about COVID-19, my heart races and palpitates'. A higher score indicated greater fear of COVID-19 (α=.81). A minor modification to the original scale, entailing introducing balanced reverse scoring, was made to reduce potential response bias.

Perceived Own Risk of COVID-19 (CORAS)

The Perceived Own Risk of COVID-19 Scale used items from the Perceived Risk of HIV Scale (Napper, Fisher & Reynolds, 2012) adapted to refer to COVID-19 (Jaspal et al., 2020). The scale comprised 10 items measured on a 5-point scale (1=strongly disagree, 5=strongly agree). Items included 'I am sure I will NOT get infected with COVID-19' and 'I feel vulnerable to COVID-19 infection'. A higher score indicated higher perceived own risk of COVID-19 (α=.87).

Uncertainty about Self-Protection

Uncertainty was indexed by a single item: 'I am just uncertain about what I should be doing to protect myself'. Responses were on a 5-point scale (1=strongly disagree, 5=strongly agree).

Mistrust of Others regarding Self-Protection

One item was used to index mistrust: 'I don't trust anyone to tell me what to do to protect myself'. Responses were on a 5-point scale (1=strongly disagree, 5=strongly agree).

Trust in Science and Scientists

The Trust in Science and Scientist Inventory (Nadelson et al., 2014) was used. It has 21 items, measured on a 5-point scale (1=strongly disagree, 5=strongly agree). Items included: 'I trust the work of scientists to make life better for people' and 'Scientific theories are untrustworthy'. A higher score indicated greater trust in science and scientists (α=.93).

Feeling Afraid

Five items were used to index how participants were feeling immediately after they had been presented with COVID-19 information while they were still completing the questionnaire. Participants indicated the extent (1=very slightly or not at all, 5=extremely) to which they were – at that moment - feeling afraid, scared, nervous, jittery, and upset. Ratings of the five feelings were summed, a higher score indicated feeling more afraid (α=.88).

Identity Change

The Identity Change Scale, consisting of 5 items, was created to measure identity change specifically in relation to COVID-19. One item measured perceived change in ability to handle risk and each of the others measured perceived change in one of the identity principles (distinctiveness, continuity, self-esteem, and self-efficacy). Responses were on a 5-point scale (1=not at all, 5=very much). The 5 items are included in the Appendix. Ratings were summed and a higher score indicated feeling a greater amount of identity change (α=.91). It should be noted that this is a measure of amount of change and not its content or direction. For instance, the change perceived in self-esteem might have involve it increasing or decreasing, or being associated with some new awareness of a different reason to value oneself.

Procedure

Participants completed the measures of identity resilience, perceived own risk of COVID-19, fear of COVID-19, and trust in science and scientists before watching a video clip. Participants were then randomly allocated to watch either a news report on COVID-19 incidence rates in the UK or to a presentation of how to use face masks and coverings correctly against COVID-19 infection. Content in the videos was already generally available in the public domain. After receiving the additional information, participants were asked to think about the video and then completed the measures of feeling afraid, identity change, uncertainty, mistrust, and demographic questions.

Results

Differences between the Video Conditions

The purpose of the video clips was to focus participants' thoughts upon current information about COVID-19. Two different videos of similar length and format were used. Two conditions were used in order to reduce the possibility of any idiosyncratic effect due to a specific video content. They were not expected to elicit different reactions if limited idiosyncrasy was present. A series of independent samples t-tests comparing measures that were taken after participants watched the videos showed no significant differences (p>0.05) between the two conditions on any of the variables. All subsequent analyses included participants who viewed both videos.

Sample Descriptive Statistics

Please see Table 2 for a summary of the descriptive statistics for the key variables.

Insert Table 2 here

Correlations

Please see Table 3 for a summary of the correlations between the main variables.

Insert Table 3 here

Multiple Regressions

Two multiple regressions were conducted to examine which independent variables predict the main dependent variables in the structural equation model (SEM) as a precursor to the full SEM analysis.

Multiple Regression Predicting Perceived Own Risk of COVID-19

The first multiple stepwise regression was conducted to examine which variables predicted the variance of perceived own risk of COVID-19. Identity resilience, feeling afraid, fear of COVID-19, uncertainty, and trust in science and scientists were inserted as predictors, with perceived own risk of COVID-19 as the dependent variable.

Fear of COVID-19 was entered at Step 1 and explained 48% of the variance in perceived own risk of COVID-19. At Step 2, fear of COVID-19 and trust in science and scientists explained 53% of the variance in perceived own risk of COVID-19. R-square change was .047 and F-change was 24.68 (p<0.001). At Step 3, fear of COVID-19, trust in science and scientists, and identity resilience explained 54% of the variance in perceived own risk of COVID-19. R-square change was .08 and F-change was 4.46 (p<.05). The regression model was statistically significant [F(3, 250)=95.731, p<.001; R^2=.538]. Of all predictors, fear of COVID-19 with a β=.685, S.E.=.044, (t=15.555, p<.001) was the most powerful, followed by trust in science and scientists with a β=.226, S.E.=.022, (t=5.199, p<.001) and identity resilience with a β=-.094, S.E.=.016, (t =-2.113, p<.05). The variables of feeling afraid and uncertainty were excluded from the model in the 3 steps.

Multiple Regression Predicting Identity Change

The second multiple stepwise regression was conducted to examine which variables predicted the variance in identity change. The variables of identity resilience, feeling afraid, fear of COVID-19, uncertainty, mistrust and trust in science and scientists were inserted as predictors, with identity change as the dependent variable.

Feeling afraid was entered in Step 1 and explained 14% of the variance in identity change. At Step 2, feeling afraid and uncertainty explained 18% of the variance in identity change. R-square change was .041 and F-change was 12.59 (p<.001). At Step 3, feeling afraid, uncertainty and mistrust explained 19% of the variance in identity change. R-square change was 0.019 and F-change was 5.94 (p=.015). The regression model was statistically significant [F(3, 250)=20.864, p<.001; R^2=.192]. Of all predictors, feeling afraid [β=.297 S.E.=.052, (t=4.975, p<.001)] was the most powerful, followed by uncertainty [β=.158, S.E.=.270, (t=2.513, p=.013)] and mistrust [β=.152, S.E.=.290, (t=2.438, p=.015)]. The variables of identity resilience, fear of COVID-19 and trust in science and scientists were excluded from the model in the 3 steps.

Structural Equation Model

Insert Figure 2 here

A SEM analysis was performed with a bootstrap at 200 with the main predictors of identity resilience and trust in science and scientists; the mediators (fear of COVID-19; feeling afraid; uncertainty; and mistrust) to predict the dependent variables of perceived own risk of COVID-19 and identity change. Model fit was good with a Root Mean Square Error of Approximation (RSMEA) of .052 and a Tucker-Lewis Index (TLI) of .957 and a Confirmatory Factor Index (CFI) of .975. As depicted in Figure 2, there were two main pathways to identity change and two pathways to perceived own risk of COVID-19.

First, identity resilience had a statistically significant effect on fear of COVID-19 with a β=-.18, S.E.=.022; p=.003, which in turn was associated with perceived own risk of COVID-19 with a β=.70, S.E.=.044; p<0.001.

Second, fear of COVID-19 had an effect on feeling afraid with a β=.44, S.E.= .045, p<0.001, which in turn predicted the variance of identity change [β=.30, S.E.=.051, p<0.001. There was also a mediation effect. Feeling afraid was associated with uncertainty with a β=.23, S.E.=.013, p<.001, which in turn had a direct effect on identity change [β=.16, S.E.=.273, p=.013]. There was also a second mediation effect. Uncertainty was associated with mistrust with a β=.36, S.E.=.048, p<0.001, which in turn predicted the variance of identity change with a β=.15, S.E.=.284, p=0.013.

Third, identity resilience had a direct effect on uncertainty with a β=-.14, S.E.=.004, p=.024, which in turn predicted the variance of identity change, as noted above.

Fourth, trust in science and scientists had a direct effect on perceived own risk of COVID-19 with a β=.22, S.E.=.022, p<0.001. Moreover, trust in science and scientists had an effect on mistrust [β=-.42, S.E.=.004, p<0.001], which in turn predicted the variance of identity change, as noted above.

Discussion

Findings from our SEM analysis are entirely compatible with the model derived from Identity Process Theory and proposed in the introduction of this paper. Each of the hypotheses tested empirically were also supported.

Identity Resilience

The study emphasises the value of examining identity resilience. Identity resilience has the power to predict emotional reactions to a global health hazard in general and at a specific moment in time. We found that identity resilience predicted both overall fear of COVID-19 and feeling afraid when COVID-19 was a focus for thought. Through fear of COVID-19, it had an indirect effect on perceived own risk of the disease. The strong relationship between fear and perceived risk has been shown in other research (Mertens et al., 2020; Yıldırım, Gecer & Akgul, 2020) and echoes previous work on the relationships between societal, institutional and specific trust (Viklund, 2003). At the same time, fear predicted uncertainty concerning self-protection against COVID-19, and, through that, mistrust of sources of information about infection prevention.

This is more than just an interesting set of findings for identity theorists. It has practical implications for health practitioners and risk analysts. For instance, COVID-19 prevention campaigns need to be more diverse in their messaging if they are to be persuasive to those scoring on both ends of the identity resilience scale. Emphasising the importance of taking personal responsibility and control might work well for those high in resilience, but be demotivating for those at the opposite end of the spectrum. Messaging should not put all its eggs in one basket. It is noticeable that during the early days of the COVID-19 outbreak diversity gave way to homogeneity and simplicity of messaging. For time-limited crises this approach may work. For long-drawn-out tragedies, it will not. The uncertainty, mistrust and confusion will overcome simple messaging, especially when policy changes have to be

introduced. Learning from the experience of COVID-19 will entail examining how identity processes shape response.

The significance of inducing fear in militating against the desired efficacy of health protection messages has long been recognised. The current findings suggest that even information that is not specifically intended to encourage people to feel afraid may do so if fear levels are already high and that this will then trigger uncertainty and mistrust. One means of breaking into this vicious circle may be to develop health interventions that focus more generally upon enhancing identity resilience. Encouraging people to recognise that they have the capacity, both individually and by working with others, to reduce the risks of COVID-19 might be one way forward. This is a different message from simply asking people to adopt self-protection measures. It involves proving to them that they can be efficacious, will be esteemed, and maintain their sense of continuity when they do so. It tells them not only what to do but also how they are likely to feel when they do it. This may be particularly important when seeking to get maximum take-up of vaccination against COVID-19 over the long-term (Dowden, 2019; Templeton et al., 2020).

Identity Change

The second part of this study concerned identity change. The basic question posed was - will participants feel that aspects of their own identity have changed after being asked to focus their thinking on COVID-19 even if only for a brief period? Identity Process Theory argues that some will, because identity processes are dynamic and will assimilate new information and will change identity configurations to accommodate to these novelties. We found that people who reported feeling more afraid, uncertain and mistrust after focussing on COVID-19 also reported a greater amount of identity change. People reported that they were experiencing identity change during the study. Showing identity change in relation to the fear and uncertainties of COVID-19 is important because it was generated by simply re-presenting information that people already had available. The data would suggest that being emotionally aroused stimulates feelings of identity change. Clearly, this may be a temporary phenomenon with no long-term change to identity occurring, and this illustrates one of the limitations of this study. It relies on cross-sectional data and we cannot determine whether the identity change reported lasts. Longitudinal studies of identity change relating to experiences of COVID-19 are needed. This is certainly supported by the discovery that having suffered COVID-19 is associated with anxiety and depression after recovery (Taquet et al., 2020).

Identity Processes

While identity change is linked to feeling afraid, uncertainty and mistrust, it is not significantly correlated with prior identity resilience. The direct path between identity resilience and change is positive but not significant. However, identity resilience is negatively related to fear of COVID-19, feeling afraid in the study, and uncertainty about self-protection. Thus, the effects of initial identity resilience on in situ identity change appear to be mediated through other influences, notably by how afraid the individual is.

The role of identity resilience and identity change in relation to COVID-19 fear and uncertainty about self-protection needs further investigation. The operationalisation of the construct of identity resilience used here focusses upon the constructs of self-esteem, self-efficacy and continuity. While recognising the importance of distinctiveness to identity resilience, it was not incorporated into this measure. This will need to be done in future research.

To have such a composite measure is valuable since there is ample evidence to show that none of these constructs acts alone in predicting beliefs, emotions or actions (Jaspal & Breakwell, 2014). The four also tend to be positively correlated, especially self-esteem and

self-efficacy. Nevertheless, a composite measure does obscure some of the diversity in identity configuration patterns. This may be important when focussing upon identity change since the same identity resilience score may be cloaking different patterns of change across the constructs. This, in itself, is worthy of further research.

The emphasis here on measuring identity resilience in terms of the principles proposed in Identity Process Theory omits consideration of what in that theory would be considered the 'content' elements of the identity. For instance, it does not consider the substantive characteristics of identity, such as those derived from group memberships or educational attainments. Such elements provide the basis for accumulating self-assessed esteem, efficacy, distinctiveness and continuity. Esteem, efficacy, distinctiveness and continuity are the product of self-appraisal. They are not automatically predicted by the socially accepted value of a substantive characteristic of identity. For instance, an individual may have membership of a prestigious group but gain no self-esteem from it. The current study used a measure of identity resilience that did not encompass the effects of any substantive content characteristics of identity. This is something which should be done in future research.

Another limitation of the study is that it only examined amount of identity change rather than also looking at the nature of that change. Subsequent studies that focus on the form of identity changes stimulated by COVID-19 will be valuable. This will also allow the relationship between initial identity resilience and type of change to be explored.

Trust in Science and Scientists

The model we tested puts considerable emphasis upon the pathways to perceived own risk of COVID-19 with input from identity resilience through fear and directly from trust in science and scientists. The role of both fear of COVID-19 and trust in science and scientists are noted for their influence upon willingness to comply with health protection advice. Our study points to the significance of bolstering trust in science and scientists if health guidelines are to be followed. Failure to trust science and scientists is strongly associated with mistrust of anyone offering guidance about COVID-19 prevention behaviours. Methods for building public trust in science have been extensively examined by the scientific establishment in recent years. Ensuring public engagement has been high on the agenda but engagement without allowing public influence has been recognised as futile. One of the implications of our work is that significant, influential engagement of the public regarding the development and uses of science is necessary where COVID-19 is concerned. In the UK, the wider public has been notably absent in designing responses to COVID-19.

Uncertainty, Mistrust and Self-Protection

Uncertainty is positively correlated with mistrust of sources of self-protection. Uncertainty about how to self-protect and mistrust seem to go hand-in-hand. Given the importance of establishing self-protection habits at a population level if COVID-19 is to be managed, it is necessary to break into this circuit of fear, mistrust and uncertainty. Legislation compelling self-protection (for example, wearing face masks, self-isolation, quarantines, or compulsory testing and tracing) has being used and caused mass protests in several countries (The Guardian, 2020). The lifespan of the political will to enact such measures may be shorter than the endurance of the virus. Additionally, during the outbreak, inconsistencies in political policies and scientific controversy have caused public confusion leading to uncertainty and mistrust in relation to what people need to do about self-protection. In fact, the longevity of the success of any intervention will be dependent on sustained political will, broad consensus on the science, and large-scale public support and participation. In part, this will rely on building a two-way flow of trust: the public trusting the politicians and scientists; and the politicians and scientists trusting the public (Renn, 2008; Renn & Levine, 1991). The UK government

established in July 2020 a new Public Health Institute to deal with pandemics and to replace earlier agencies. It may do well to focus on how fear, mistrust and uncertainty can be mitigated or managed – especially with regard to the adoption of vaccination protocols.

Feeling Afraid

Reporting feelings of being afraid during the study itself seems to be an important predictor of subsequent responses. It is interesting that relatively few online surveys ask respondents to say how they are feeling at the moment that they are completing a questionnaire. This was the question asked of respondents in the current study after they had received additional information about the disease. It is possible to think of their response as an 'emotion snapshot' captured in that specific moment. It would be worth exploring further how emotional reactions during the research process itself substantively influence apparent relationships between key variables. Studies on risk afford great scope for such analyses of emotion in the research process itself. Indeed, Slovic (2010) pointed out that risk itself needs to be understood as an emotion.

Reporting feeling afraid at that moment in the study, besides being correlated with uncertainty, was a significant positive correlate of identity change. The measure of identity change used here did not assess the direction of change, only its extent. Therefore, it cannot be assumed that being afraid was associated with some detriment to identity or, indeed, with some enhancement to it. The data simply show that feeling more afraid is associated with more identity change. The changes might have been adaptive or maladaptive. Primarily, this study suggests that feeling afraid when considering a health risk is linked to processes of identity change. Identity processes of assimilation and accommodation may be triggered by the heightened emotional state. Feeling afraid motivates reassessment of one or more of the four aspects of identity that were examined here. Fear of COVID-19 has no significant direct effect on identity change but, mediated through its relationship with feeling afraid, may have an indirect effect. Amount of identity change is also additionally positively correlated with levels of uncertainty and mistrust. Identity process theory postulates that, in response to changes in our social context, we adopt a variety of strategies to facilitate their assimilation-accommodation in identity. It is plausible that, amid fear, uncertainty and mistrust, the processes of assimilation-accommodation in identity of these changes will be less effective or more aversive for psychological wellbeing. This may be regarded as the *imposition*, rather than management, of change. However, this question will need to be examined in future research.

Limitations of the Study

Some of the limitations of this study are mentioned above. There are others. First, the measure of identity resilience used in this study did not include a subscale focusing on distinctiveness. Future research should incorporate distinctiveness into measures of identity resilience in ways that allow for the situational specificity of the concept. Second, although our study reveals an indirect relationship between identity resilience and identity change, it is not clear whether resilience influences the form of change. This should be examined in future work. Third, online recruitment of participants is likely to skew the sample away from older, less digitally savvy populations. Fourth, the cross-sectional data presented in this study do not enable us to draw conclusions about causation. The relationships between identity resilience, emotional reactions to risks and self-protection decisions in the context of uncertainty and mistrust need to be addressed using experimental and preferably longitudinal research designs as this pandemic continues.

Conclusions

The proposed model based on Identity Process Theory of relationships between identity resilience, COVID-19 responses, and identity change was supported empirically. Identity resilience is a predictor of fear of COVID-19, which in turn predicts perceived own risk of the disease. People asked to focus on information about COVID-19, irrespective of whether it refers to risks of infection or methods of self-protection, report that they experience more change in their identity if reflecting on that information makes them feel afraid, mistrust or uncertainty.

Interventions to establish greater long-term public willingness and capacity to adopt self-protection methods need to systematically tackle current mistrust and uncertainty, by raising general levels of trust in science and scientists, but must also harness the power of identity resilience to moderate fear of COVID and promote constructive behavioural change. This will be a marathon, rather a sprint.

Employing a composite measure of identity resilience has value and the construct needs further elaboration as part of the broader theory of identity processes. Focused measurement of amount of identity change during efforts to cope with health threats may be productive in directing the design of health interventions that achieve sustainable change in behaviour.

Declaration of interest statement

The authors have no interests to declare.

Data availability statement

The data set associated with this article can be obtained by contacting the corresponding author.

References

Ahorsu, D. K., Lin, C. Y., Imani, V., Saffari, M., Griffiths, M. D., & Pakpour, A. H. (2020). The Fear of COVID-19 Scale: Development and Initial Validation. *International Journal of Mental Health and Addiction*. https://doi.org/10.1007/s11469- 020-00270-8.

Arsandaux, J., Montagni, I., Macalli, M., Bouteloup, V., Tzourio, C., & Galéra, C. (2020). Health risk behaviors and self-esteem among college students: Systematic review of quantitative studies. *International Journal of Behavioral Medicine*, *27*(2), 142–159. https://doi.org/10.1007/s12529-020-09857-w

Bonaiuto, M., Breakwell, G. M., & Cano, I. (1996). Identity processes and environmental threat: The effects of nationalism and local identity upon perception of beach pollution. *Journal of Community & Applied Social Psychology*, *6*(3), 157–175. https://doi.org/10.1002/(SICI)1099-1298(199608)6:3%3C157::AID-CASP367%3E3.0.CO;2-W

Breakwell, G. M. (2001). Social representational constraints upon identity processes. In K. Deaux & G. Philogène (Eds.), *Representations of the Social: Bridging Theoretical Traditions* (p. 271–284). Oxford: Blackwell Publishing.

Breakwell, G. M. (2014). *The Psychology of Risk*. Cambridge: Cambridge University Press.

Breakwell, G. M. (2015a) *Coping With Threatened Identities.* Hove: Psychology Press, Taylor & Francis.

Breakwell, G. M. (2015b). Risk: Social psychological perspectives. In J. D. Wright (eds), *The International Encyclopedia of the Social and Behavioral Sciences (2nd ed.)* (pp.711-716). Elsevier.

Breakwell, G. M. (2015c). Identity process theory. In G.E. Sammut, E. E. Andreouli, G. E. Gaskell, & J. E. Valsiner (eds), *The Cambridge Handbook of Social Representations* (pp. 250-266). Cambridge: Cambridge University Press.

Breakwell, G. M. (2020a). In the age of societal uncertainty, the era of threat. In D. Jodelet, J. Vala, & E. Drozda-Senkowska (eds) *Societies Under Threat: A Pluri-disciplinary Approach* (pp. 55-74). New York: Springer-Nature.

Breakwell, G. M. (2020b) Mistrust, uncertainty and health risks. *Contemporary Social Science.* https://doi.org/10.1080/21582041.2020.1804070

Breakwell, G. M., Jaspal, R., & Fino, E. (2020). COVID-19 preventive behaviours in White British and Black, Asian and Minority Ethnic people in the UK. Under review.

Chryssochoou, X. (2014). Identity processes in culturally diverse societies: how is cultural diversity reflected in the self? In R. Jaspal & G. M. Breakwell (eds.), *Identity Process Theory: Identity, Social Action and Social Change* (pp. 135-154). Cambridge: Cambridge University.

Collett, N., Pugh, K., Waite, F., & Freeman, D. (2016). Negative cognitions about the self in patients with persecutory delusions: An empirical study of self-compassion, self-stigma, schematic beliefs, self-esteem, fear of madness, and suicidal ideation. *Psychiatry Research*, *239*, 79-84. https://doi.org/10.1016/j.psychres.2016.02.043

Dowden, A. (2019). Tackling the declining uptake of childhood vaccinations. *Prescriber*, *30*(5), 34-37. https://doi.org/10.1002/psb.1763

Goldsteen, R. L., & Goldstein, K. (1990). An investigation into support for restrictions on HIV carriers in the Chicago metropolitan area. *Revista de Saúde Pública*, *24*(1), 28-38.

Gruzd, A., & Mai, P. (2020). Going viral: How a single tweet spawned a COVID-19 conspiracy theory on Twitter. *Big Data & Society.* https://doi.org/10.1177/2053951720938405

Hajek, C. (2019) Gay midlife men's intergenerational and interpersonal (non)accommodation in the negotiation of HIV infection risk: Implications for sexual vitality, generational distinctiveness, and self-preservation. *Health Communication*, *34*(14), 1731-1740. https://doi.org/10.1080/10410236.2018.1517710

Harper, C. A., Satchell, L. P., Fido, D., & Latzman, R. D. (2020). Functional fear predicts public health compliance in the COVID-19 pandemic. *International Journal of Mental Health and Addiction.* https://doi.org/10.1007/s11469-020-00281-5

Hendy, J., Lyons, E., & Breakwell, G. M. (2006). Genetic testing and the relationship between specific and general self-efficacy. *British Journal of Health Psychology, 11(2*), 221-223. https://doi.org/10.1348/135910705X52543

Herek, G. M., Gillis, J. R., Glunt, E. K., Lewis, J., Welton, D., & Capitanio, J. P. (1998). Culturally sensitive AIDS educational videos for African American audiences: effects of source, message, receiver, and context. *American Journal of Community Psychology*, *26*(5), 705–743. https://doi.org/10.1023/a:1022157914906

Jaspal, R. & Breakwell, G.M. (eds.) (2014*). Identity Process Theory: Identity, Social Action and Social Change*. Cambridge: Cambridge University Press.

Jaspal, R., Fino, E., & Breakwell, G. M. (2020). The COVID-19 Own Risk Appraisal Scale (CORAS): Development and validation in two samples from the United Kingdom. *Journal of Health Psychology*. http://doi.org/10.1177/1359105320967429

Jaspal, R. (2018). *Enhancing Sexual Health, Self-Identity and Wellbeing among Men Who Have Sex With Men: A Guide for Practitioners*. London: Jessica Kingsley Publishers

Lofstedt, R. (2013). Communicating food risks in an era of growing public distrust: three case studies. *Risk Analysis: An International Journal*, *33*(2), 192-202. https://doi.org/10.1111/j.1539-6924.2011.01722.x

Lopes, B. & Jaspal, R. (2020). Understanding the mental health burden of COVID-19 in the United Kingdom. *Psychological Trauma: Theory, Research, Practice and Policy*, *12*(5), 465–467. https://doi.org/10.1037/tra0000632

Lovari, A. (2020). Spreading (dis) trust: Covid-19 misinformation and government intervention in Italy. *Media and Communication*, *8*(2), 458-461. https://doi.org/10.17645/mac.v8i2.3219

Lyons, E. (1996). Coping with social changes: processes of social memory in the reconstruction of memories. In G. M. Breakwell & E. Lyons (eds.), *Changing European Identities: Social Psychological Analyses of Social Change* (pp. 31-40). Oxford: Butterworth-Heinemann.

Mertens, G., Gerristen, L., Salemink, E., & Engelhard, I. M. (2020). Fear of the coronavirus (COVID-19): Predictors in an online study conducted in March 2020. *Journal of Anxiety Disorders*, *74*, 102258. https://doi.org/10.1016/j.janxdis.2020.102258

Miles, A., Voorwinden, S., Mathews, A., Hoppitt, L. C., & Wardle, J. (2009). Cancer fear and the interpretation of ambiguous information related to cancer. *Cognition and Emotion*, *23*(4), 701–713. https://doi.org/10.1080/02699930802091116

Nadelson, L., Jorcyk, C., Yang, D., Jarratt Smith, M., Matson, S., Cornell, K. and Husting, V. (2014), Trust in science and scientists. *School Science & Mathematics, 114*, 76-86. https://doi.org/10.1111/ssm.12051

Napper, L. E., Fisher, D. G., & Reynolds, G. L. (2012). Development of the perceived risk of HIV scale. *AIDS and Behavior*, *16*(4), 1075–1083. https://doi.org/10.1007/s10461-011-0003-2

Pakpour, A. H., & Griffiths, M. G. (2020). The fear of COVID-19 and its role in preventive behaviors. *Journal of Concurrent Disorders.* https://concurrentdisorders.ca/2020/04/03/the-fear-of-covid-19-and-its-role-in-preventive-behaviors/

Rajkumar, R. P. (2020). COVID-19 and mental health: A review of the existing literature. *Asian Journal of Psychiatry*, *52*, 102066. https://doi.org/10.1016/j.ajp.2020.102066

Renn, O. (2008). *Risk Governance: Coping with Uncertainty in a Complex World*. London: Routledge.

Renn, O., & Levine, D. (1991). Credibility and trust in risk communication. In R. E. Kasperson & P. J. M. Stallen (eds), *Communicating Risks to the Public* (pp. 175-217). Dordrecht: Springer.

Rosenberg, M. (1965). *Society and the Adolescent Self-Image*. Princeton, NJ: Princeton. University Press.

Rossi, A., Panzeri, A., Pietrabissa, G., Manzoni, G. M., Castelnuovo, G., & Mannarini, S. (2020). The anxiety-buffer hypothesis in the time of COVID-19: when self-esteem protects from the impact of loneliness and fear on anxiety and depression. *Frontiers in Psychology*, *11*, 2177. https://doi.org/10.3389/fpsyg.2020.02177

Ruiter, R. A. C., Verplanken, B., Kok, G., & Brug, J. (2001). Evoked fear and effects of appeals on attitudes to performing breast self-examination: An information processing perspective. *Health Education Research*, *16*, 307–319. https://doi.org/10.1093/her/16.3.307

Schulenberg J. E., Maggs J. L., & O'Malley P. M. (2003) How and why the understanding of developmental continuity and discontinuity is important. In J. T. Mortimer, M. J. Shanahan (eds) *Handbook of the Life Course. Handbooks of Sociology and Social Research* (pp.413-436). Boston, MA: Springer.

Schwarzer, R., & Jerusalem, M. (1995). Generalized Self-Efficacy scale. In J. Weinman, S. Wright, & M. Johnston (eds.), *Measures in Health psychology: A User's Portfolio. Causal and Control Beliefs* (pp. 35-37). Windsor, UK: Nfer-Nelson.

Sedikides, C., Wildschut, T., Routledge, C., & Arndt, J. (2015). Nostalgia counteracts self-discontinuity and restores self-continuity. *European Journal of Social Psychology*, *45*(1), 52–61. https://doi.org/10.1002/ejsp.2073

Siegrist, M., Gutscher, H., & Earle, T. C. (2005) Perception of risk: the influence of general trust, and general confidence. *Journal of Risk Research*, *8*(2), 145-156. https://doi.org/10.1080/1366987032000105315

Slovic, P. (2010). *The Feeling of Risk: New Perspectives on Risk Perception*. London: Routledge.

Taquet, M., Luciano, S., Geddes, J. R., & Harrison, P. J. (2020). Bidirectional associations between COVID-19 and psychiatric disorder: retrospective cohort studies of 62 354 COVID-19 cases in the USA. *The Lancet Psychiatry*. https://doi.org/10.1016/S2215-0366(20)30462-4

Templeton, A., Guven, S. T., Hoerst, C., Vestergren, S., Davidson, L., Ballentyne, S., ... & Choudhury, S. (2020). Inequalities and identity processes in crises: Recommendations for

facilitating safe response to the COVID-19 pandemic. *British Journal of Social Psychology*, *59*(3), 674-685. https://doi.org/10.1111/bjso.12400

The Guardian (2020) Thousands march in London in fourth anti-lockdown protest. 24 October 2020. https://www.theguardian.com/world/2020/oct/24/london-braces-for-fourth-protest-against-covid-19-restrictions

Torales, J., O'Higgins, M., Castaldelli-Maia, J. M., & Ventriglio, A. (2020). The outbreak of COVID-19 coronavirus and its impact on global mental health. *The International Journal of Social Psychiatry*, *66*(4), 317–320. https://doi.org/10.11772F0020764020915212

Viklund, M. J. (2003). Trust and risk perception in Western Europe: A cross-national study. *Risk Analysis: An International Journal*, *23*(4), 727-738. https://doi.org/10.1111/1539-6924.00351

Wang, C., Pan, R., Wan, X., Tan, Y., Xu, L., McIntyre, R.S., & Ho, C. (2020). A longitudinal study on the mental health of general population during the COVID-19 epidemic in China. *Brain, Behavior and Immunity*. https://doi.org/10.1016/j.bbi.2020.04.028.

Yıldırım, M., Geçer, E., & Akgül, Ö. (2020). The impacts of vulnerability, perceived risk, and fear on preventive behaviours against COVID-19. *Psychology, Health & Medicine* https://doi.org/10.1080/13548506.2020.1776891

Waizenegger, L., McKenna, B., Cai, W., & Bendz, T. (2020) An affordance perspective of team collaboration and enforced working from home during COVID-19. *European Journal of Information Systems*, *29*(4), 429-442. https://doi.org/10.1080/0960085X.2020.1800417

Appendix

The Identity Change Scale

When you think about [stimulus], do you think it changes in any way how you think about your own..

1. feelings of competence?
2. self-esteem?
3. sense of consistency over time?
4. ability to handle risk?
5. sense of distinctiveness?

Responses are measured on a 5-point scale (1=not at all, 5=very much)

Table 1. Socio-demographic characteristics of the sample

Ethnicity	**White British**	**White Other**	**White and Black Caribbean**	**White and Asian**	**Pakistani**	**Bangladeshi**	**Indian**	**Caribbean**	**African**
	N=127 (51%)	*N*=3 (1.2%)	*N*=3 (1.2%)	*N*=2 (.8%)	*N*=39 (15.5%)	*N*=4 (1.6%)	*N*=27 (10.8%)	*N*=17 (6.8%)	*N*=29 (11.6%)
Religion	**No religion**	**Christianity**	**Islam**	**Hinduism**	**Sikhism**	**Judaism**	**Other**		
	N=118 (47%)	*N*=75(29.9%)	*N*=29 (11.6%)	*N*=15 (6%)	*N*=6 (2.4%)	*N*=1 (.4%)	*N*=7 (2.8%)		
Relationship Status	**Single**	**Married**	**Unmarried – with partner**	**Cohabiting**	**Divorced**	**Civil partnership**			
	N=113 (45%)	*N*=71 (28.3%)	*N*=41 (16.3%)	*N*=17 (6.8%)	*N*=6 (2.4%)	*N*=3 (1.2%)			
Income	**Less than £10,000**	**£10,000 to £19,999**	**£20,000 to £29,999**	**£30,000 to £39,999**	**£40,000 to £49,999**	**£50,000 to £59,999**	**£60,000 or more**		
	N=73 (29.1%)	*N*=46 (18.3%)	*N*=61 (24.3%)	*N*=38 (15.1%)	*N*=16 (6%)	*N*=6 (2.4%)	*N*=12 (4.8%)		
Employment status	**Employed**	**Self-employed**	**Furloughed**	**Student**	**Retired**	**Unemployed**			
	N=126 (50.2%)	*N*=20 (8%)	*N*=2 (8.8%)	*N*=55 (21.9%)	*N*=5 (2%)	*N*=23 (9.2%)			
Education	**Under-graduate Degree**	**A-/ AS-Levels**	**GCSE/O Level**	**Post-graduate Degree**	**Apprentice-ship**	**Other**			
	N=100 (39.8%)	*N*=76 (30.3%)	*N*=28 (11.2%)	*N*=38 (15.1%)	*N*=4 (1.6%)	*N*=5 (2%)			
Gender	**Male**	**Female**	**Non-binary**						
	N=97 (38.6%)	*N*=153 (61%)	*N*=1 (.4%)						

Table 2. Descriptive statistics for the key variables

Continuous variables	*Sample Mean*	*SD*	*Minimum*	*Maximum*
Age	33.99	13.39	18	72
Identity resilience	100.18	17.80	50	145
Feeling afraid	10.76	5.13	6	27
Fear of COVID-19	27.97	6.33	10	45
Perceived own risk of COVID-19	27.55	6.37	9	44
Uncertainty	2.04	1.04	1	5
Mistrust	2.08	0.97	1	5
Trust in science and scientists	74.75	12.55	37	103
Identity change	9.50	4.48	5	22

Table 3. Correlations between the main variables

	1	2	3	4	5	6	7	8
1. Identity resilience		-.25**	-.19**	-19**	-.20**	-.16*	-.04	.11
2. Feeling afraid	-.25**		.47**	.33**	.27**	.25**	.38**	-.18**
3. Fear of COVID-19	-.18**	.47**		.70**	.18*	.12	.20**	-.03
4. Perceived own risk of COVID-19	-.19**	.33**	.34**		.15*	-.06	.09	.19**
5. Uncertainty	-.20**	.27*	.18**	.15*		.39**	.30**	-.08
6. Mistrust	-.16*	.25**	.12**	-.06	.39**		.29**	-.44**
7. Identity change	-.04	.38**	.20**	.09	.30**	.29**		-.11
8. Trust in science and scientists	.11	-.18**	-.03	.19**	-.08	-.44**	-.11	

*p<.05; **p<.005

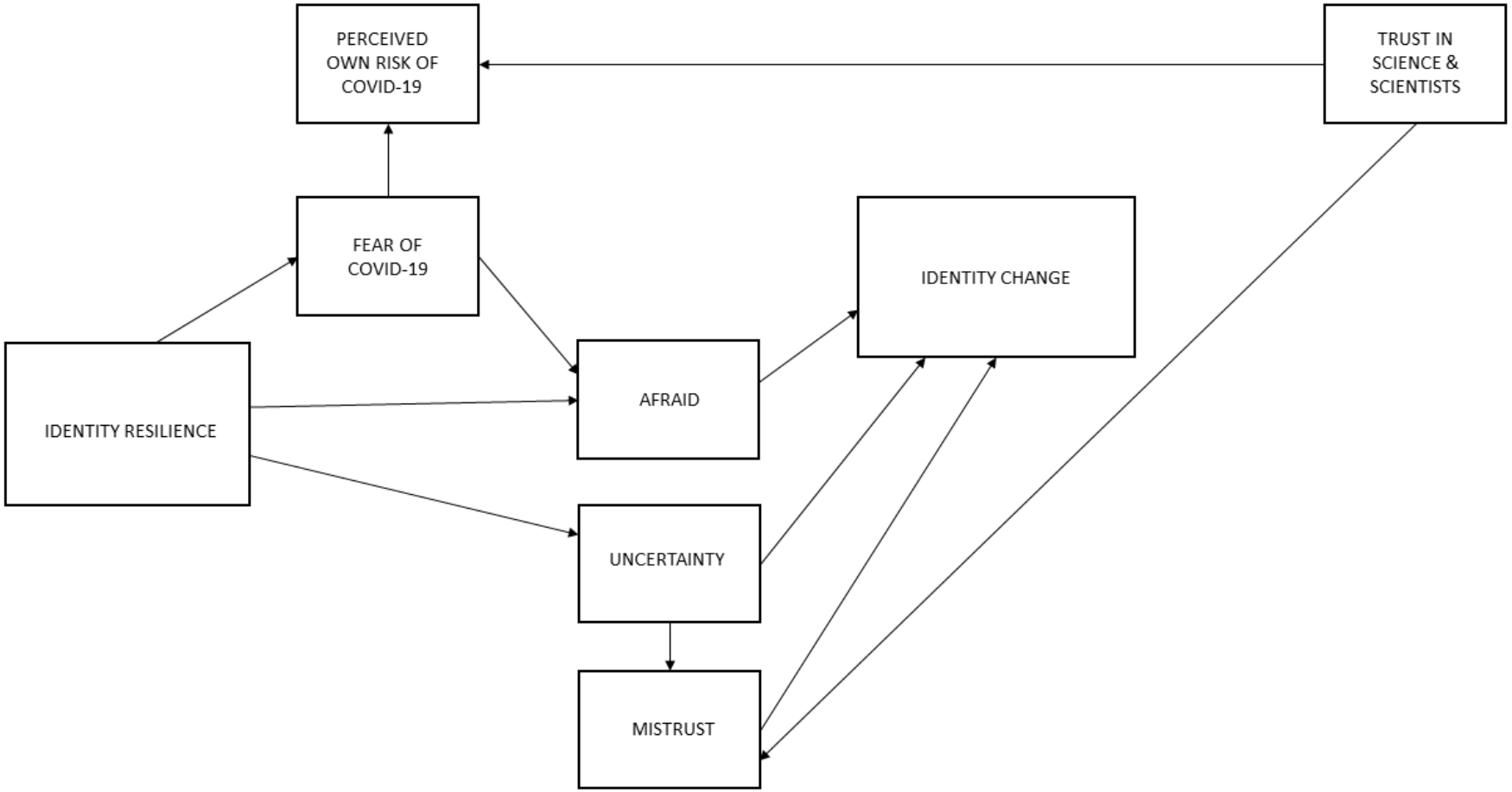

Figure 1: A model of identity resilience and change

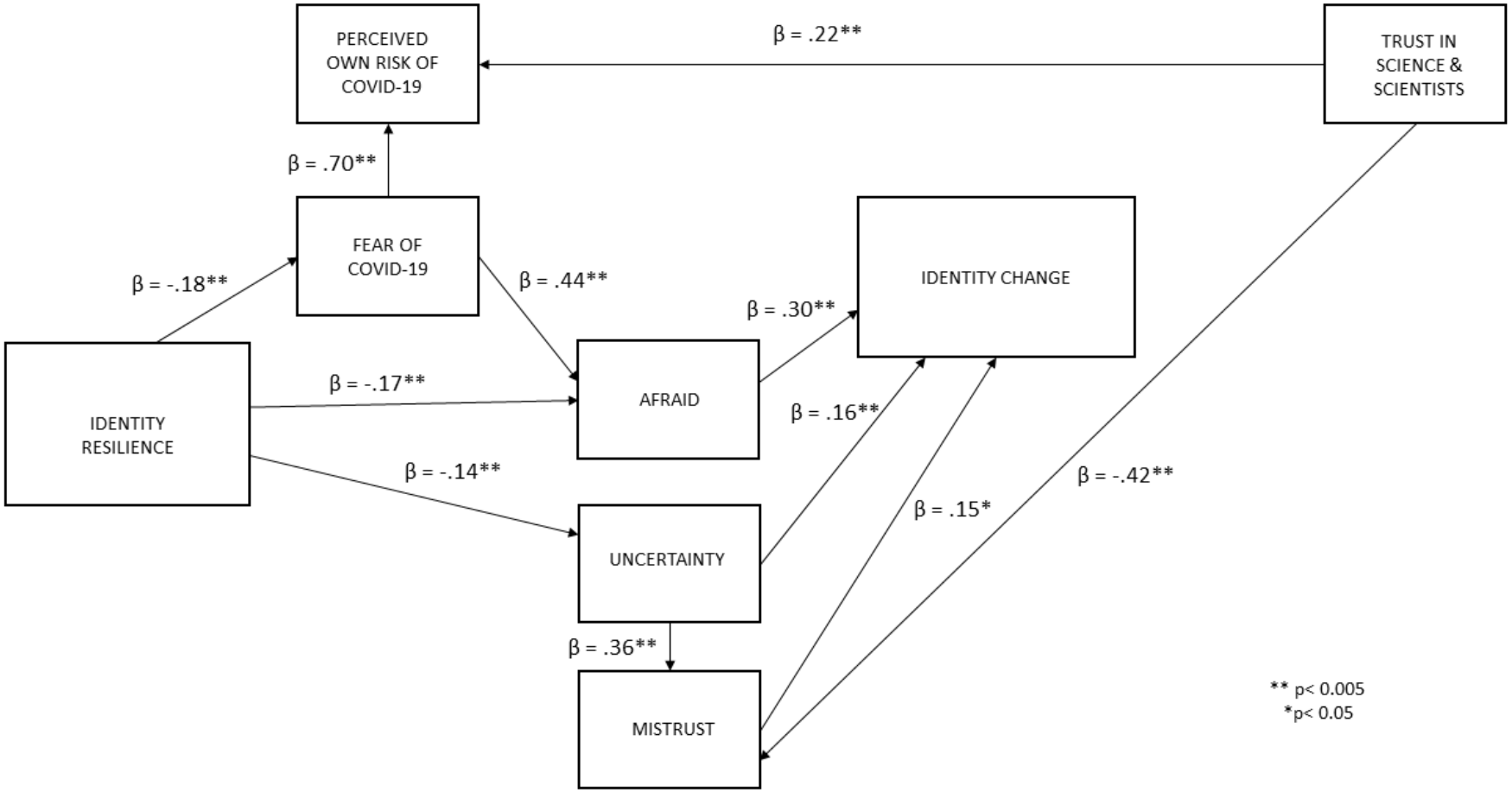

Figure 2: A structural equation model of identity resilience and change