Perceived loss of resources and adherence to guidelines during the COVID-19 pandemic in Israel

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Summary
Following the outbreak of the global COVID-19 pandemic, governments around the world issued guidelines designed to prevent contagion. This longitudinal study explored variables associated with citizens’ adherence to these guidelines. Questionnaires were administered to a panel of Israeli citizens three times: in June (Time 1, n = 896), July (Time 2, n = 712) and August (Time 3, n = 662) 2020. The relationships of perceived loss of resources (e.g. stable employment) at Time 1 with adherence to guidelines at Time 2 and Time 3 were moderated by assumptions about controllability: The relationships were stronger for people who believed that appropriate behavior would lead to positive outcomes and prevent negative outcomes. The results indicate that messages about the pandemic should be accompanied by encouraging messages regarding the ability to control.

Keywords: COVID-19 pandemic, adherence to guidelines, loss of resources, controllability

INTRODUCTION

In response to the COVID-19 pandemic, declared at the beginning of 2020 as a global emergency (World Health Organization, 2020), governments around the world developed measures designed to slow the spread of the virus. The official guidelines published by national authorities pertained to hygienic practices, keeping a safe distance from others and avoiding gathering spaces, quarantine and avoiding contact with others if a person has been exposed to COVID-19, isolation separating a person who has contracted the virus and imposed lockdowns.

When preventive guidelines require significant lifestyle changes and involve enormous psychological and economic costs, as the COVID-19 pandemic imposed (Maftei and Holman, 2022), nonadherence can be as high as 70% (e.g. [Chesney et al., 2000; Li et al., 2000]). It is vital to understand why people adhere to regulations because adherence to guidelines is fundamental to the success of behavioral interventions designed to control epidemics (Bogg and Milad, 2020). Such knowledge can contribute to the management of public behavior during the pandemic and planning for upcoming pandemics (Chan, 2021). However, because global pandemics and strict guidelines produced in response to them are unprecedented in the past century, there is little psychological research that directly applies to these circumstances (Bogg and Milad, 2020; Harper et al., 2021). Studies of individual differences in adherence to guidelines have mostly addressed the effect of personal characteristics such as political orientation (Harper et al., 2021) or conscientiousness (Blagov, 2021). Yet, the subjectivity of people’s perceptions of the impact of the pandemic on them as individuals should also be considered, because although the pandemic affects everyone’s life, there is variance in the severity of its impact on people’s social and financial resources (Gratz et al., 2020; Ganson et al., 2021). Furthermore, research derived from the conservation of resources theory (COR; Hobfoll, 1989) indicates individual differences in people’s perceptions of and reactions to the loss of resources, that are associated with characteristics such as gender (Johnson et al., 2009; Hobfoll et al., 2012; Snyder et al., 2020) and regulatory focus (Marx-Fleck et al., 2021). Beyond the pandemic’s objective diverse effect on individuals’ loss
of resources (e.g. many people lost their jobs whereas others did not), there might also be differences in perceptions of and responses to the pandemic effects. The first purpose of the present study was to evaluate the relationship between perceived loss of resources during the pandemic and adherence to guidelines. The second purpose was to explore the moderating effect of personal assumptions about controllability (i.e. people’s belief that the world is relatively controllable, Janoff-Bulman, 1992) in the relationship of perceived loss of resources with adherence to guidelines.

LITERATURE REVIEW

Perceived loss of resources and adherence to guidelines

COR theory (Hobfoll, 1989) is a ‘motivational theory that explains much of human behavior based on the evolutionary need to acquire and conserve resources for survival’ (Hobfoll et al., 2018, p. 104), suggesting that people rely on resources to support their well-being and goal attainment (Hobfoll, 1989). COR theory defines resources as objects, conditions, personal characteristics and energies that are valued in their own right or because they act as means to achieve or protect valued resources (Hobfoll, 1988; Halbesleben et al., 2014).

COR theory has been widely adopted to explain the impact of mass traumatic events, including disaster, war and terrorism, on individuals (Kaiser et al., 1996; Smith and Freedy, 2000; Hobfoll et al., 2006; Johnson et al., 2009; Hobfoll et al., 2012). COR theory suggests that exposure to traumatic events often results in rapid and substantive material and psychosocial resource loss. Mass traumatic events that affect whole communities are inherently threatening to people’s resources, both tangible and psychological (Hobfoll, 1998). As a result of such traumas, victims often lose tangible goods, supportive persons in their lives and psychological resources such as hope and optimism (Heath et al., 2012). Such losses mean that traumatic events will have a severe initial impact and that the ongoing nature of loss might produce ongoing deleterious effects (Hobfoll et al., 2009) because the lost psychosocial and economic resources are the very resources that people require to support resilience (Heath et al., 2012; Snyder et al., 2020). Loss of interpersonal, intrapersonal, economic and material resources is a key predictor of psychological distress in large-scale stressful events (Hobfoll et al., 2006, 2007; Johnson et al., 2009; Snyder et al., 2020).

We suggest that these principles of COR theory can be applied to the COVID-19 pandemic, which shares the qualities of other mass trauma events (Hobfoll et al., 2012), being a large-scale stressful event beyond the individual’s control and having the potential to cause great harm. Although a major consequence of the COVID-19 pandemic was considered health-related, for many people, it also involved major losses in terms of employment, the economic situation and social relationships (Crayne, 2020; Gratz et al., 2020; Zhai and Du, 2020; Merino et al., 2021). During the pandemic, more than 30 million adults in the United States alone have filed for unemployment benefits (Crayne, 2020; Rugaber, 2020). Unemployment is considered a major psychosocial stressor that adds worry and strain to daily life. Unemployment is associated with poorer health, and its duration is related to decreased psychological and physiological functioning (Dupre et al., 2012; Aguilar-Palacio et al., 2015; Griep et al., 2016; Sumner and Gallagher, 2017). In a study conducted during the COVID-19 pandemic (Ganson et al., 2021), employment loss and expected employment loss were associated with a greater risk of anxiety and depression.

The COVID-19 pandemic also involved restrictions that greatly limited social contact. Thus, a consequence of social distancing guidelines may be an increase in social isolation and related feelings of loneliness (Gratz et al., 2020; Reger et al., 2020). The detrimental effects of loneliness and social isolation, which have been documented in numerous studies conducted in ‘routine’ times (e.g. [Cattan et al., 2005]), are likely to be more extensive during a pandemic because social relationships are especially needed in times of trauma, disasters and pandemics (Mak et al., 2009). In a study during the COVID-19 pandemic, loneliness due to social distancing guidelines was related to higher levels of psychological distress (Horesh et al., 2020).

According to COR theory (Hobfoll, 1989), people who lack resources are the most vulnerable to additional resource loss, which they are unable to offset. The risk of contagion of the COVID-19 virus might have been especially threatening for people who felt that they had lost social, employment or financial resources because contagion implies more restrictive social isolation and inability to work. When people experience perceived or actual loss of resources, they tend to react with stress and strive to minimize the net loss of resources (Hobfoll, 1989). The basic tenet of COR theory is that ‘people strive to retain, protect, and build resources and that what is threatening to them is the potential or actual loss of these valued resources’ (Hobfoll, 1989, p. 516). Thus, people exert great efforts in attempting to create and maintain personal characteristics and social circumstances that will increase the likelihood of receiving positive reinforcement and avoiding losses (Hobfoll, 1989). For example, Marx-Fleck et al. (Marx-Fleck et al., 2021)
found that people avoid personal risks to conserve resources when they lack capacity or fear losses but are willing to accept personal risks when they perceive their resources to be sufficient.

Adherence to some health guidelines involves loss of resources, primarily social resources, due to the inability to meet others. Therefore, apprehension about losing social resources might prevent people from adhering to health guidelines. However, the evaluated risk of losing social ties might depend on the initial strength of such ties. When family relationships are generally stable, as in the case of Israel (Lavee and Katz, 2003), the loss of social resources is likely to be viewed as temporary, because relationships are expected to renew when social distancing is over. By contrast, illness due to contagion might involve a variety of both short terms and long-term losses. Therefore, based on the COR theory’s prediction regarding people’s strong basic motivation to prevent losses, it was expected that loss of resources would be related to better adherence to health guidelines.

Hypothesis 1: Controlling for baseline adherence to guidelines, perceived loss of resources is positively related to subsequent adherence to guidelines.

Moderating effect of controllability assumptions

Janoff-Bulman (Janoff-Bulman, 1992) suggested that people generally regard their world as relatively controllable and believe that they can directly control what happens to them through their behavior: Engaging in appropriate precautionary behaviors protects from negative events. According to Janoff-Bulman (Janoff-Bulman, 1992), these core assumptions are established at early developmental stages and might be undermined following a traumatic experience. However, we can expect variability in the assumption of the controllability of the world, even among people who have not experienced a traumatic event.

A prominent feature shared by mass traumatic events is that these events cannot be controlled by an individual (Hobfoll et al., 2012). The global nature of the pandemic, repeated failure of authorities in many countries to control its spread, and fundamental uncertainty involved in its progress suggest that it was beyond the control of individuals (Trzebiński et al., 2020). Thus, although concepts reflecting a sense of personal ability to control events, such as self-efficacy, are used to measure adherence related to controllable events (e.g. driving [Dong et al., 2019]), regarding the pandemic, the concept of fundamental assumptions about the controllability of events is a more suitable framework for assessing people’s perceptions of control. Controllability can reflect individual differences that affect adherence because people vary in their assumptions about controllability. We hypothesized that the motivation to adhere to guidelines following the perceived loss of resources would be stronger among people with strong controllability assumptions, who believe that they have the ability to prevent negative events through preventive actions designed to protect themselves. These people can be expected to believe that ‘doing the right thing’ will help prevent additional losses. By contrast, people who do not believe that negative outcomes depend on their behavior might be less motivated to prevent losses through adherence to guidelines.

Hypothesis 2: Controlling for baseline adherence to guidelines, controllability assumptions moderate the relationship of perceived loss of resources with subsequent adherence to health guidelines, such that the relationship is stronger under strong controllability assumptions.

The present study

Previous research on adherence to guidelines addressing health risks has focused mostly on the effect of personality. The present study addresses the COVID-19 pandemic as a risk context (Brown, 2020) and highlights the role of perceived loss of resources in the willingness to adopt health guidelines. To the best of our knowledge, this is the first study to explore individual differences in adherence to guidelines based on COR theory (Hobfoll, 1989).

The longitudinal design of the study provided the possibility to explore the impact of the predicting variables (e.g. loss of resources and controllability) on adherence to guidelines over time. The study was conducted in Israel at three points in 2020: June 7–14, July 7–14 and August 10–17. The percentage of citizens who were found positive for COVID-19 at the time of the study was 1–2% in June, 5–6% in July and 7–9% in August (Israel Ministry of Health, 2020). As of June 2020, the number of deaths caused by COVID-19 in Israel was 40, at July the number of deaths was 237 and at August the number of deaths increased to 396. The unemployment rate during the pandemic was about 10% at all measurements, compared to about 4% in June 2019 (Israel Ministry of Finance, 2020). Mandatory health guidelines communicated in the media at the time of the study were: staying at home during the lockdown or following a positive COVID-19 diagnosis or being in proximity of a person who was diagnosed as positive to COVID-19; avoiding participation in large groups; wearing a mask in public places. Additional recommended guidelines were to stay at home whenever possible (even when there was no official lockdown), maintain social distance, and maintain hygiene practices.
METHODS
Participants and procedure
Participants recruited via a survey institute responded to the research questionnaire online after reading the introductory letter. The inclusion criterion was age 18 or older. In June (T1), N = 501 citizens participated in the study (73% response rate). To increase the number of participants, additional questionnaires were administered after a few days, with an additional N = 395 respondents. The response rate for these respondents was low (18%) due to the large number of questionnaires sent out (N = 4268). In total, N = 896 respondents participated in Time 1. In July (T2), questionnaires were sent to all the participants of T1 and 712 responded (79% of participants in T1). In August (T3) questionnaires were sent to all the participants of T2 and N = 662 participants (93% of participants in T2 and 74% of participants in T1). Of the respondents, 49% were women, their mean age was 40.86 (SD = 14.77, range = 18–74), and 29% had up to 12 years of education, 55% had 13–15 years of education and 16% had more than 15 years of education. The percentage of respondents reporting that either themselves or a family member were in quarantine, were 11% at T1, 18% at T2 and 26% at T3. The percentage of respondents reporting that themselves or a family member were diagnosed with COVID-19 were 4% at T1, 5% at T2 and 8% at T3. To test selective dropout we analyzed age, education and gender. The results of t-tests show that there are no significant differences related to gender or education. Age related difference was close to significance at T2 (p < 0.1).

The results show that dropout rates were somewhat higher among younger participants (median years = 33 compared to median years = 36 in the non-dropout group at T1; median years = 34 compared to median years = 40 in the non-dropout group at T2).

The study was approved by the University Committee for Ethical Research with Humans (No. 18/20).

Measures
Adherence to health guidelines
Similar to studies measuring to regarding national guidelines in their country (e.g. [Freeman et al., 2022]), we asked about adherence to four guidelines issued in Israel at the time of the study: washing hands, maintaining physical distance from others, staying at home, and wearing a mask. We also asked about not touching surfaces in public places and disinfecting products delivered to the house because at the time of the study, there were various opinions about the sustainability of the COVID-19 virus on surfaces and several prominent health professionals recommended these measures in the media. Participants were asked to respond to the following question regarding each behavior: ‘How frequently do you perform each behavior these days compared to your behavior before the outbreak of the coronavirus pandemic: washing hands with soap or using Alco gel; disinfecting products delivered to the house; maintaining physical distance with people who do not live in the same house; avoiding touching surfaces at public places; staying at home; and wearing a mask.’ Responses were given on a 7-point scale (1 = no more than usual; 7 = much more than usual). Omega reliabilities were 0.81 for T1, 0.80 for T2, and 0.82 for T3. As can be seen in Table 3, the test re-test reliability of the measure is high (r = 0.66, p < 0.01 at T1–T2; r = 0.68, p < 0.01 at T1–T3; r = 0.72, p < 0.01 at T2–T3).

Perceived loss of resources
Based on the COR Evaluation (Hobfoll and Lilly, 1993), we developed a scale assessing the loss of interpersonal, financial and work resources. Respondents were asked to rate the extent to which each of nine resources was damaged since the beginning of the pandemic: ‘close relationships with family members’; ‘family stability’; ‘close relationships with friends’; ‘time to work’; ‘resources required for work’; ‘stable employment’; ‘sufficient income’; ‘money for emergencies’; ‘money for extras’. Although the original response scale used the term loss, we adapted the translation to the Hebrew language, using the synonym damage, which carries a less extreme connotation in Hebrew. Responses were on a 7-point scale (1 = not damaged at all or damaged to a small extent; 7 = damaged to a large extent). Respondents also had the option to indicate that each item was not relevant to them. In Hobfoll and Lilly (Hobfoll and Lilly, 1993), test-retest reliabilities ranged from 0.35 to 0.64. According to the authors, tests of the measure suggest that the COR Evaluation is as reliable and valid as other commonly used life event measures. In the present study, test–retest reliabilities were 0.66–0.76. Omega reliabilities were 0.92 for T1 and T2 and 0.89 for T3. The full version of the scale is presented in the Appendix, ranked according to the order of the means of items.

Controllability assumptions
Respondents rated four items comprising the controllability dimension of the World Assumptions Scale (Janoff-Bulman, 1989): ‘People’s misfortunes result from mistakes they have made’; ‘Through our actions, we can prevent bad things from happening to us’; ‘If people took preventive actions, most misfortune could be avoided’ and ‘When bad things happen, it is typically because people have not taken necessary actions to protect themselves.’ Responses were on a 5-point scale (1 = strongly disagree; 5 = strongly agree). The author reported that the factor structure that emerged
from a factor analysis of the scale was identical to the theoretically proposed structure and maintained that given the face validity of the items, the independent factor structure and the reliabilities of the subscales, the scale can be used as a research tool (Janoff-Bulman, 1989). Omega reliabilities were 0.78, 0.79 and 0.81 for T1, T2 and T3, respectively.

Control variables

We included control variables found to affect risk perceptions and adherence to safety rules: gender (Maftei and Holman, 2022), age (Pedersen and Favero, 2020; Chan, 2021) and education (Nivette et al., 2021). We also controlled for the effects of several variables related to COVID-19, i.e. respondents’ pandemic-related experiences and those of their first-degree family members. Respondents were presented with the several items, asking them to indicate whether either themselves or one of their close family members had each of the following experiences: ‘being in quarantine due to exposure to COVID-19’ (yes/no); ‘being diagnosed with COVID-19’ (yes/no); ‘belonging to high-risk groups due to medical conditions such as high blood pressure, diabetes, or illness related to a weakened immune system’ (yes/no); These variables might affect adherence to guidelines or the relationship between loss of resources and adherence. Specifically, experiencing quarantine and belonging to a high-risk group might increase the tendency to adhere to guidelines or moderate the relationship of loss with adherence, because people might feel that they need to be more careful. By contrast, being diagnosed with COVID-19 might reduce the tendency to adhere to guidelines if it is viewed as providing immunity to the virus.

All variables were measured at the three-time points. The items comprising each research variable were averaged.

Statistical analyses

The first hypothesis was tested with regression analyses predicting adherence to guidelines with loss of resources, controlling for baseline adherence. The second hypothesis was tested with the PROCESS version 3.5 procedure (Hayes, 2013), with 5000 bootstrap resamples. Model 1 was used to test the hypothesized moderation effect. Participants with missing data for the second or third-time point were excluded from the relevant analyses. The analyses were controlled for demographic and pandemic-related variables.

Pandemic-related control variables included in the analyses, as well as controllability, were matched to the time-point of the measurement of adherence to guidelines (i.e. at T2 pandemic-related variables and controllability reported at T2 were included in the analyses; at T3, these variables reported at T3 were included in the analyses).

RESULTS

Test of the ranking of perceived loss of resources indicates that perceived loss due to the pandemic is weakest regarding social resources (e.g. mean = 2.55 for ‘family stability’), and strongest regarding financial resources (e.g. mean = 4.53 for ‘Money for emergencies’). Table 1 presents percentages, means and standard deviations of the research variables and background variables at three points. Analyses of variance for repeated measures were conducted to test differences in research variables among the three measurements. The results show significant differences among time points (small to medium effect sizes), except for assumptions about controllability. Adherence to guidelines increased from T1 to T2 and decreased at T3; perceived loss of resources increased from T1 to T2 and remained stable at T3. Table 2 presents correlations between

| Table 1: Percentages, means and standard deviations at three time-points |
|---------------------------------|-----------------|-----------------|-----------------|-----|--------|
|                                | T1 (n = 896) (M (SD) or n (%)) | T2 (n = 712) (M (SD) or n (%)) | T3 (n = 662) (M (SD) or n (%)) | F   | Partial η² |
| Adherence to guidelines        | 4.76 (1.40)      | 5.07* (1.26)     | 4.82 (1.42)      | 28.18* | 0.09   |
| Perceived loss of resources    | 3.53* (1.63)     | 3.74 (1.68)       | 3.81 (1.67)       | 15.46* | 0.05   |
| Controllability assumptions    | 2.95 (.85)       | 3.01 (0.84)       | 2.99 (.83)        | 1.97  | 0.00   |
| Quarantinea                    | 98 (11)          | 123 (17)          | 171 (26)          |      |        |
| Diagnosed with COVID-19a       | 29 (3)           | 29 (4)            | 42 (6)            |      |        |
| Belongs to a health risk groupa| 472 (53)         | 367 (52)          | 348 (52)          |      |        |

Note. Pandemic-related variables: 1= ‘yes’, 2 = ‘no’.

*Self or family member.

*p < 0.01.
research variables, demographic variables and COVID-19-related variables.

The first hypothesis posited that perceived loss of resources at T1 would be positively related to adherence to guidelines at T2 and at T3. Regression analyses were conducted to test the effect of loss of resources on adherence beyond the effect of baseline adherence at T1. Variables were entered in three steps. In the first step demographic variables and pandemic-related variables were entered, to assess their separate effect on adherence. In the second step, adherence to guidelines at T1 was added, to assess its addition to the prediction of adherence, beyond the effect of the demographic variables and pandemic-related variables. The results, presented in Table 3, show that adherence at T1 adds significantly to the prediction of adherence at T3. Finally, loss of resources was added in step 3. The results support the hypothesis, showing that when baseline adherence was entered as a predictor, loss of resources at T1 significantly predicted adherence to guidelines at T2 and T3. However, the additional explained variance beyond the variance explained by previous adherence was very small, suggesting that adherence is mainly predicted by the level of previous adherence.

Moderation analyses were performed to assess whether assumptions about controllability interacted with the perceived loss of resources to predict adherence to guidelines. The results, presented in Table 4, show that controlling for baseline adherence, perceived controllability moderated the relationship of loss of resources at T1 with adherence to guidelines at T2 ($F = 6.16, p < 0.05$) and T3 ($F = 4.69, p < 0.05$). As Figure 1 demonstrates, for both times the relationship was stronger for respondents with a medium or high sense of controllability than for respondents with a low sense of controllability. Simple slope tests showed that the relationship of loss of resources at T1 was significantly related to adherence at T2 under a medium level of controllability ($B = 0.06, SE = 0.03, 95\% CI 0.01–0.11$) and a high level of controllability ($B = 0.11, SE = 0.04, 95\% CI 0.04–0.18$), but not under a low level of controllability ($B = 0.01, SE = 0.03, 95\% CI –0.06–0.08$). Similarly, the relationship of loss of resources at T1 with adherence at T3 was significant under a medium level of controllability ($B = 0.06, SE = 0.03, CI = 0.01–0.11$) and a high level of controllability ($B = 0.12, SE = 0.03, 95\% CI 0.05–0.18$), but not a low level of controllability ($B = 0.00, SE = 0.03, 95\% CI –0.05–0.07$).

**DISCUSSION**

The study elaborated on previous research on adherence to pandemic-related guidelines, which has focused mostly on the effect of personality, by highlighting the role of people's view of the pandemic's effect on their social and financial resources, in willingness to adopt guidelines over time. The first hypothesis predicted that loss of resources would be positively related to adherence to guidelines over time. The regression analyses suggest that loss of resources has a significant but small effect on adherence to guidelines, while the moderation analyses indicate a non-significant effect.

**Table 2: Correlations of research variables**

|                     | 1     | 2     | 3     | 4     | 5     | 6     |
|---------------------|-------|-------|-------|-------|-------|-------|
| 1. Perceived loss of resources T1 |       |       |       |       |       |       |
| 2. Adherence to guidelines T1     | 0.18** |       |       |       |       |       |
| 3. Adherence to guidelines T2     | 0.21** | 0.66** |       |       |       |       |
| 4. Controllability assumptions T2 | 0.05  | 0.15** | 0.14** |       |       |       |
| 5. Adherence to guidelines T3     | 0.20** | 0.68** | 0.73** | 0.16** |       |       |
| 6. Controllability assumptions T3 | 0.04  | 0.09* | 0.11* | 0.57** | 0.11** |       |
| Gender                          | 0.11** | 0.12** | 0.14** | -0.16** | 0.07  | -0.16** |
| Age                             | -0.12** | 0.02  | 0.02  | 0.04  | 0.00  | 0.04  |
| Education                       | -0.05  | -0.03 | -0.02 | 0.06  | -0.01 | 0.06  |
| Diagnosed with COVID-19         | -0.02  | 0.00  | -0.02 | -0.00 | 0.07  | 0.12* |
| Quarantine                      | -0.02  | -0.02 | 0.00  | -0.00 | 0.02  | 0.06  |
| Health risk                     | -0.01  | -0.03 | -0.03 | 0.04  | -0.08*| 0.03  |

*Note. Gender: 1 = man, 2 = woman; pandemic-related variables: 1 = ‘yes’, 2 = ‘no’.

* $p < 0.05$.

** $p < 0.01$.**
Thus, adherence was mainly predicted by adherence at previous times, whereas loss of resources added little to the explained variance. The lack of a strong direct relationship between loss of resources and adherence might be related to the concept of controllability. People who lost resources might be reluctant to invest their limited remaining resources in adherence when there is a general sense that the outcome of such resource investment is uncertain. This explanation is supported by the results related to the second hypothesis, presented in Table 4, which shows that assumptions about controllability moderated the relationship of loss of resources at T1 with adherence at T2 and T3.

At both times the relationship between perceived loss of resources and adherence to guidelines was stronger for people with medium or high levels of controllability assumptions, i.e. people who believe that the detrimental effects of negative events can be prevented by cautious behavior (Janoff-Bulman, 1989). In the context of the pandemic, these controllability assumptions might have encouraged adherence to guidelines to prevent additional losses due to illness. People with strong controllability assumptions might have been willing to pay the costs involved in adherence to guidelines (e.g. not meeting with others) because they believe that paying such costs is worthwhile to prevent the higher costs
involved in contagion. In contrast, people who did not believe that their behavior can prevent negative outcomes might have been less willing to pay such costs.

Limitations and future research

Our sample was biased toward younger ages. One possible reason for this bias is the on-line method of data collection, which might have excluded older participants who might have less access to the internet or are less inclined to use it. Future research should sample respondents with a more balanced representation of age groups, perhaps using an additional method of data collection, because the COVID-19 pandemic was riskier for older people, who might also have different experiences of loss of resources and a different fundamental inclination to adhere to rules and guidelines (Kripalani et al., 2010). About half of the respondents in our samples reported that they or one of their family members belong to a high-risk group due to medical conditions such as high blood pressure, diabetes, or illness related to a weakened immune system. The high rate of reported health conditions might be due to participants referring to their parents’ health conditions rather than to their own because older age often involves such health problems. However, because we do not have information about the subject of these data (respondents or their family members), the sample might be biased toward people with health problems. Although the questionnaire was administered three times, none of the surveys were conducted during a lockdown, which represents extreme conditions both in terms of the spread of the virus and the costs of adherence to guidelines. In future research, a comparison of adherence at more and less extreme points of a global crisis would provide information about the impact of periodic events on adherence to guidelines.

Lastly, the finding that perceived loss of resources is positively related to adherence to guidelines might depend on the strength of normative social ties in a culture. The present study was conducted in Israel, where social ties are usually strong (Lavee and Katz, 2003). Respondents in this study might have perceived that adherence to social distancing guidelines involves a low-level risk of long-term loss of social resources. However, further research is needed to explore the relationship of perceived loss of resources with adherence in other cultures. Specifically, in cultures characterized by weaker and less stable social ties, loss of resources might be related to less adherence to guidelines, due to the perceived risk of losing social resources.

Table 4: Results of PROCESS moderation tests

|                        | Adherence to guidelines T2 (n = 712) | Adherence to guidelines T3 (n = 662) |
|------------------------|--------------------------------------|--------------------------------------|
|                        | B         | SE     | 95% CI       | B         | SE     | 95% CI       |
| Adherence T1           | 0.57**   | 0.03   | 0.51, 0.63   | 0.67**   | 0.03   | 0.61, 0.73   |
| Loss of resources T1   | -0.15     | 0.09   | -0.33, 0.03  | -0.14     | 0.09   | -0.32, 0.04  |
| Controllability        | -0.17     | 0.11   | -0.39, 0.05  | -0.11     | 0.11   | -34, 0.12    |
| Gender                 | 0.16      | 0.08   | -0.00, 0.32  | 0.02      | 0.09   | -0.15, 0.19  |
| Age                    | -0.00     | 0.00   | -0.00, 0.00  | -0.00     | 0.00   | -0.00, 0.00  |
| Education              | -0.00     | 0.02   | -0.04, 0.03  | -0.02     | 0.02   | -0.05, 0.01  |
| Diagnosed with COVID-19a,b | 0.10     | 0.15   | -0.20, 0.40  | 0.22      | 0.16   | -0.09, 0.53  |
| Quarantinea,b          | -0.15     | 0.10   | -0.33, 0.04  | -0.10     | 0.10   | -0.30, 0.09  |
| Health riska,b         | -0.02     | 0.08   | -0.00, 0.32  | -0.17*    | 0.08   | -0.34, -0.01 |
| Loss of resources X controllability | 0.07 | 0.03 | 0.01, 0.13 | 0.07 | 0.03 | 0.00, 0.13 |
| Controllabilityb       |                      | F = 6.16*   | 0.03 0.01, 0.13  | F = 4.69*  | 0.03 0.00, 0.13 |
| Low (-1 SD)            | 0.01      | 0.03   | -0.06, 0.08  | 0.00      | 0.03   | -0.05, 0.07  |
| Medium (M)             | 0.06      | 0.03   | 0.01, 0.11   | 0.06      | 0.03   | 0.01, 0.11   |
| High (+1 SD)           | 0.11      | 0.04   | 0.04, 0.18   | 0.12      | 0.03   | 0.05, 0.18   |

Note. N = 5000 bootstrapping resamples; CI = bias-corrected confidence interval for α = 0.05. Gender: 1 = man, 2 = woman; pandemic-related variables: 1 = ‘yes’, 2 = ‘no’.aSelf or family member. bPandemic-related control variables included in the analyses were matched to the time-point of the measurement of adherence to guidelines. *p < 0.05. **p < 0.01.
Implications

Based on the finding that controllability affected the relationship of resource loss with the inclination to adhere to guidelines, it is recommended that messages about the pandemic be accompanied by encouraging messages regarding the ability to control outcomes. Public health professionals should communicate messages in the media (e.g. public TV channels, internet news channels) regarding the positive impact of activities such as maintaining social distance or wearing a mask to prevent contagion. Data about the relationship between personal activities designed to avoid contagion (e.g. percentages of contagion among vaccinated/not vaccinated) can serve this purpose and
might be especially valuable in the context of a global crisis involving an acute sense of uncertainty and loss of control. Additionally, elevating a general belief about the controllability of the pandemic might also lead to a sense that adherence to guidelines can affect the prospects of maintaining personal health.

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**Ethical Approval**

The study was approved by the University Committee for Ethical Research with Humans (No. 18/20).

**Conflict of Interest**

The authors have no conflicts of interest to declare.

**Data Availability**

Data are available upon reasonable request from the authors.

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