



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.



Contents lists available at ScienceDirect

# Personality and Individual Differences

journal homepage: [www.elsevier.com/locate/paid](http://www.elsevier.com/locate/paid)

## Being others-oriented during the pandemic: Individual differences in the sense of responsibility for collective health as a robust predictor of compliance with the COVID-19 containing measures<sup>☆</sup>

Kinga Lachowicz-Tabaczek<sup>\*</sup>, Monika A. Kozłowska

Institute of Psychology, University of Wrocław, Poland

### ARTICLE INFO

#### Keywords:

Sense of responsibility for collective health  
Narcissism  
Pandemic-related worry  
Social responsibility personal values  
Acceptance of restrictions  
Social distancing  
Hygiene  
COVID-19 pandemic

### ABSTRACT

This study aimed to identify and examine a context-specific personality variable that would allow for robust prediction of compliance with COVID-19 pandemic measures. Therefore, we analyzed the specificity of the current pandemic and proposed a concept and a measure of individual differences in the sense of responsibility for collective health (SRCH). This concept reflects individual's others-oriented approach to the pandemic. It refers to an individual's concern for collective health and the feeling of obligation to contribute to contain the pandemic in one's social environment. The results of Study 1 confirmed SRCH as the strongest predictor of the acceptance of pandemic-related restrictions, when comparing its predictive value with that of pandemic-related worries (considered a context-specific but self-oriented tendency) and two general traits indicating high orientation towards the self (i.e., grandiose and vulnerable narcissism). In Study 2, we compared the ability of SRCH to predict increased hygiene and social distancing with that of pandemic-related worries and narcissistic traits, and of social responsibility personal values—treated as others-oriented personality trait. The results revealed that SRCH explained most of the variance in social distancing, whereas pandemic-related worries predicted most of the variance in hygiene practices, although leaving SRCH a significant predictor.

### 1. Introduction

The COVID-19 pandemic has affected the lives of people worldwide, posing challenges due to the rapid transmission of infection, mortality rates, and uncertainty about its further course. Persons infected with SARS-CoV-2 can remain asymptomatic (Bai et al., 2020; Tindale et al., 2020), and cases of the asymptomatic transmission of the virus can account for more than 50% of all transmission (Johansson et al., 2021). This indicates that infected individuals may unknowingly threaten the health of many people around them.

According to health experts, compliance with the hygiene routine, physical distancing, and self-limiting behavior are crucial to mitigate the effects of the COVID-19 pandemic (Engle et al., 2020; Kissler et al., 2020; Kraemer et al., 2020). Therefore, people can control the transmission of infections if they decide to give up some of their freedoms to protect themselves and others (see Jetten et al., 2020). However, if people adopt precautionary measures based solely on the assessment of

their own health, they may contribute to the spread of SARS-CoV-2, risking exposure among those who are most vulnerable. Thus, to protect themselves and others and contribute to contain the pandemic, individuals must be aware of the threat they can pose and stay consistently motivated to protect one's own health as well as the health of others, regardless of the symptoms of infection. Although the struggle with COVID-19 is now supported by vaccines, people's behavior during the pandemic continues to be of vital importance.

Thus, in the current situation, it is crucial to identify the psychological factors that can predict as well as potentially increase compliance with the recommended precautionary measures (Bavel et al., 2020; Holmes et al., 2020). Thus, the field of personality and social psychology could contribute to the efforts against the virus spread by identifying personality variables that are effective predictors of health-related behavior during the COVID-19 pandemic. In trying to determine such variables, the socio-cognitive approach to personality is helpful as it shows how cognitive and affective personality processes and structures

<sup>☆</sup> The data that support the findings of this research are openly available in Open Science Framework at [https://osf.io/a54rb/?view\\_only=626c05e0e6e248f88ce4a3f3d33a208f](https://osf.io/a54rb/?view_only=626c05e0e6e248f88ce4a3f3d33a208f).

<sup>\*</sup> Corresponding author at: Institute of Psychology, University of Wrocław, ul. Dawida 1, 50-527 Wrocław, Poland.  
E-mail address: [kinga.lachowicz-tabaczek@uwr.edu.pl](mailto:kinga.lachowicz-tabaczek@uwr.edu.pl) (K. Lachowicz-Tabaczek).

<https://doi.org/10.1016/j.paid.2021.111138>

Received 17 October 2020; Received in revised form 2 July 2021; Accepted 12 July 2021

Available online 21 July 2021

0191-8869/© 2021 Elsevier Ltd. All rights reserved.

may interplay with the features of the situation, resulting in specific behaviors (Bandura, 2012; Caprara et al., 2004; Mischel & Shoda, 1995). According to the social-cognitive theory (Bandura, 2001, 2012), context-specific personality measures can efficiently predict behavior in a concrete situation since they reflect individuals' interpretation of the situation and perception of their relationship with the current social environment. Such measures are often operationalized as beliefs about oneself and own ability to effectively act in certain situations (Bandura, 2012; Cervone et al., 2001). Identifying context-related individual differences as predictors of behaviors performed in specific circumstances has significant application value, as such specific beliefs are more malleable than general personality traits (Bandura, 2012).

The aim of the current study was to develop a measure capable of predicting behaviors aimed at mitigating the current pandemic (i.e., acceptance of the pandemic-related restrictions and health-related recommendations including social distancing, using masks and sanitizers, etc.). Based on the analysis of the characteristics of the current pandemic involving a high rate of infections resulting from asymptomatic transmission of the virus, an individual's motivation not to infect others seems to be of vital importance in stopping the spread of the virus. Therefore, we developed a measure of individual differences reflecting the concern for other's health and feeling of obligation to contribute to limit the spread of the virus within one's broader social environment. We named this construct: "the sense of responsibility for collective health (SRCH)". We posited that the measure of SRCH as a context-specific and others-oriented variable would be a strong predictor of health-related attitudes and behaviors during pandemic.

### 1.1. The role of context-specific individual differences and personality traits in predicting health-related behavior during COVID-19 pandemic

As of the time of writing this article, several predictors of accepting and endorsing health-protective behaviors that may limit the spread of the SARS-CoV-2 have been identified. Among them are general personality traits, such as those proposed by the Five-Factor model, and malevolent ones, such as the Dark Triad of personality traits or psychological entitlement (Aschwanden et al., 2020; Blagov, 2020; Miguel et al., 2021; Zajenkowski et al., 2020; Zitek & Schlund, 2020). The context-dependent individual differences include measures such as personal fear of COVID-19 (Harper et al., 2020; Mertens et al., 2020; Taylor et al., 2020), beliefs regarding the mechanism of virus transmission, beliefs about the effectiveness of the recommended precautions (Clark et al., 2020), and conspiracy beliefs concerning the pandemic (Allington et al., 2020), etc. The findings of recent studies revealed that some personality traits such as Conscientiousness as well as Dark Triad traits and psychological entitlement are related to a greater or lower likelihood of engaging in hygiene-promoting behaviors and social distancing, respectively (Aschwanden et al., 2020; Blagov, 2020; Zajenkowski et al., 2020; Zitek & Schlund, 2020). However, predicting compliance with health-protective recommendations and acceptance of restrictions seems to be more effective when based on context-specific measures of individual differences, rather than on traits. For instance, Clark et al. (2020) found that beliefs regarding the effectiveness of precautions in preventing the spread of the virus were a considerably stronger predictor (assessed by semipartial correlations) of implementing health precautions compared with Extraversion and Conscientiousness. Zajenkowski et al. (2020) found that personality variables provided no additional variance in the compliance with pandemic restrictions than did specific beliefs concerning the pandemic.

### 1.2. Others-oriented or self-oriented approach during COVID-19 pandemic

When developing their individual approach to pandemic, people may focus relatively more on protecting their own health or the health of others. Both these dominant orientations may have important

implications for compliance with protective behaviors during pandemic.

In a study by Leary et al. (2020), among concerns regarding COVID-19, only the concern about infecting others was found to be associated with social distancing practices. However, Wise et al. (2020) found that engagement in health-protective behaviors (e.g., social distancing and frequent hand-washing) was best predicted by the perceived probability of being personally infected, rather than by the possibility of transmitting the disease to others. In addition, Harper et al. (2020) found that the fear of being ill was a significant predictor of enhanced hygiene and social distancing.

A clearer pattern of results was observed when general traits were examined as predictors of pandemic-related behavior. Traits with a high focus on oneself and one's own interests, such as the Dark Triad traits (i.e., narcissism, Machiavellianism, and psychopathy) and psychological entitlement, were negatively related to the endorsement of health-related behavior during the pandemic (Blagov, 2020; Nowak et al., 2020; Zajenkowski et al., 2020; Zitek & Schlund, 2020). In turn, greater social responsibility values among adolescents in the United States, which indicate a high focus on others, were associated with the frequent use of disinfectants, whereas a high value for one's own self-interest predicted low adherence to social distancing (Oosterhoff & Palmer, 2020).

These findings do not clearly indicate the relationship between self-interest and behavior during pandemic. Some of the results indicate that compliance with health-protecting measures is mostly related to the tendency to protect oneself against the virus (associated, for instance, with fear of COVID-19), while other findings show the prominent role of protecting others (associated with concern about infecting others or with social responsibility values) in this respect.

### 1.3. The sense of responsibility for collective health

Due to the specificity of SARS-CoV2 transmission, to mitigate the spread of infection, the members of a community should consistently adopt the recommended health-protecting behaviors even when they do not experience the symptoms of the disease. This approach demands thinking in terms of common good, which in the case of a pandemic means concern about protecting the health of people in one's social environment and feeling obliged to make efforts to contain the pandemic. We assumed that such civic approach to the pandemic would strongly motivate consistent compliance with health guidelines among individuals during the pandemic.

At the time we planned our studies, there was (and to the best our knowledge still is) a lack of context-specific personality variables representing such an individual's civic perception and approach to the pandemic. Thus, we proposed the concept of the sense of responsibility for collective health (SRCH) which we define as being personally concerned for collective health and obliged to contribute to the containment of the pandemic in one's own social environment. This kind of civic approach to a pandemic assumes the focus of an individual on other people rather than solely on the self.

### 1.4. The current studies

The main goal of this study was to examine the role of individual differences in SRCH in predicting compliance with COVID-19 containing measures. We also wanted to examine whether the measure of SRCH, which reflects an others-oriented approach to the current pandemic, would explain more variance in health-protecting attitudes and behavior than individual variables indicating a strong orientation towards the self, both being specifically related to the current pandemic (such as worries about the consequences of being personally infected with COVID-19), or traits (such as grandiose and vulnerable narcissism). We also wanted to compare the predictive power of SRCH with an others-oriented trait represented in our study by social responsibility personal values.

In both studies, as self-oriented variables specifically related to the current pandemic we measured worries about oneself or one's close others getting infected and concern about personal, material consequences of the pandemic. These variables refer to the fear of the threat posed by the disease. Fear, as an emotional response to a threat, is associated with a strong tendency to focus on its avoidance, which in the case of pandemic may motivate people to undertake actions aimed at protecting themselves or close others from the infection (Taylor, 2019). In at least one study, the fear of coronavirus was confirmed as a predictor of compliance with health guidelines (Harper et al., 2020).

In both studies we included grandiose and vulnerable narcissism as self-oriented personality traits. We focused on narcissism, since narcissistic individuals (both grandiose and vulnerable) not only exhibit strong self-focus but also manifest several antagonistic tendencies towards others, such as high levels of psychological entitlement as well as interpersonal exploitativeness and increased feelings of envy and hostility (Miller et al., 2011). Additionally, grandiose narcissism is related to the involvement in health-risk behaviors (Buelow & Brunell, 2014). All of these tendencies may contribute to decreased motivation to protect the health of other people in their environment and low readiness to use precautionary behavior during pandemic. The role of narcissism in predicting behavior during the COVID-19 pandemic was confirmed in recent studies among other Dark Triad traits (e.g., Blagov, 2020).

We also compared (only in Study 2) the predictive power of SRCH with an others-oriented disposition—social responsibility personal values (SRPV)—defined as a general orientation towards prosocial and civic behaviors (Wray-Lake & Syvertsen, 2011). The role of social responsibility as a predictor of compliance with precautionary measures was confirmed by Oosterhoff & Palmer, 2020.

To fulfill our goal, we conducted two studies to investigate the strength of the relationship between SRCH and the acceptance of pandemic restrictions (Study 1) and its role in predicting compliance with precautionary measures (i.e., practicing social distancing and increased hygiene) to contain the pandemic (Study 2) in comparison with other self- or others-oriented traits as well as context-specific individual differences.

## 2. Study 1

In this study, we aimed to develop and verify a scale designed to measure SRCH. In line with the definition of the construct, high scores on this scale would indicate strong tendencies to feel concern for collective health during the pandemic and to feel obliged to contribute to the containment of the pandemic in one's social environment. We named the scale "the sense of responsibility for collective health questionnaire (SRCHQ)". In this study we examined the reliability and internal structure of SRCHQ. Further, we investigated its relationship with the levels of the acceptance of pandemic-mitigating restrictions.

We also wanted to examine whether SRCHQ would predict the acceptance of restrictions better than self-oriented variables measures. Taking into account that SRCH is an others-oriented variable revealing a civic approach during the pandemic time, SRCHQ should be able to better predict the acceptance of restrictions compared with measures of self-oriented personality traits or context-specific individual differences. We assumed that people who are less likely to perceive the pandemic as a collective problem would accept and support actions directed at improving the situation in their social environment, to a lesser extent. As self-oriented traits we tested grandiose and vulnerable narcissism. As a self-oriented context-specific variable we measured pandemic-related worries. In the case of pandemic-related worries, orientation towards the self can manifest through worries about: (a) getting personally infected or close others getting infected, and (b) deterioration of one's material situation owing to the pandemic. Being concerned about close others' health can be considered as a self-oriented tendency since the structure representing the self is densely interconnected with the representation of close others (Aron & Fraley, 1999).

## 2.1. Method

### 2.1.1. Participants and procedure

We recruited 551 participants from a Polish-speaking sample (55,9% female) registered at the online Ariadna research panel. Participants were rewarded with points that were exchangeable for gifts from the Ariadna research panel rewards program. Before running the analysis we screened the data for unreliable responses (we excluded automated and duplicated responses as well as the responses from participants who completed the study in less than five minutes). The final sample was composed of 505 participants (56,4% female). The study sample was diverse in terms of demographic variables (for details see *Supplemental materials*), approximating Polish population proportions with regard to education and place of residence. A sensitivity analysis using *G\*Power* software (Faul et al., 2009) indicated that given an alpha of 0.05, and an assumed power of 0.95, our sample of 505 was appropriate to detect a minimum effect of  $f^2 = 0.145$ . The study took place between March 25–April 1, 2020, when pandemic-related restrictions in the form of an extensive lockdown were introduced in Poland. The government introduced limits on free movements, except for professional activities and essential life activities. Restrictions on public transport as well as on gathering in groups of more than two people were introduced.

### 2.1.2. Ethical procedures

All data collection procedures were reviewed and approved by Ethics Committee at the Institute of Psychology, University of Wrocław. Individuals were invited to participate in the study via an e-mail that included a brief study description and a link to the survey. They were informed that participation was voluntary and anonymous. After reading the instructions and providing informed consent, the participants completed a demographic survey and a series of questionnaires.

### 2.1.3. Measures

**2.1.3.1. Sense of Responsibility for Collective Health Questionnaire.** The Sense of Responsibility for Collective Health Questionnaire was intended to measure individual differences in SRCH based on the SRCH construct presented earlier in this paper. The SRCHQ consists of the following statements: "It is very important for me not to infect others if I become infected with the new coronavirus (SARS-CoV-2)"; "In the current epidemiological situation, everyone is obliged to take care of the health and safety of others, even strangers"; "I am afraid that when I get sick, I may contribute to the deterioration of the health situation in my environment"; "It is important to follow the recommendations in force in the country so as not to infect others". The participants responded to these statements on a scale ranging from 1 (*definitely not*) to 5 (*definitely yes*). Composite scores of the SRCHQ were calculated by averaging participants' responses (Cronbach's  $\alpha = 0.77$ ).

**2.1.3.2. Pandemic-Related Worries Survey.** The Pandemic-Related Worries Survey (PRWS) was developed for the purpose of this study to measure individual differences in the level of pandemic-related worries. The PRWS consists of eight sentences comprising two separate subscales. The Health Worries Scale (Cronbach's  $\alpha = 0.82$ ) describes worries and anxieties about oneself or close others getting infected (e.g., "The thought that I could get sick with the coronavirus disease (COVID-19) makes me anxious"). The Material Worries Scale (Cronbach's  $\alpha = 0.78$ ) describes the consequences of the pandemic on the participant's material situation (e.g., "I am afraid that my own earnings may decrease significantly because of the pandemic"). Responses to each item were made on 1 (*to a very small extent*) to 5 (*to a very large extent*) scales and were averaged into separate composites, i.e., material worries and health worries (for more details, see *Supplemental materials*).

**2.1.3.3. Narcissistic Personality Inventory.** To measure grandiose

narcissism we used the Polish adaptation of the Narcissistic Personality Inventory (NPI; Raskin & Hall, 1988) by Bazińska and Drat-Ruszczak (2000). The Polish version of the NPI consists of 34 items (e.g., “I like to look at my body”), which are grouped into four subscales: demand for admiration, vanity, self-sufficiency, and leadership. The participants responded by indicating the extent to which the sentences reflected the way they perceived themselves on a 5-point scale ranging from 1 (*not me*) to 5 (*it is me*). In this study, we used the participants' total scores to measure grandiose narcissism. The results were averaged to create a composite scores of grandiose narcissism. The scale's Cronbach's  $\alpha$  in this sample was 0.95.

**2.1.3.4. Hypersensitive Narcissism Scale.** We used the Polish translation of the Hypersensitive Narcissism Scale (HSNS; Hendin & Cheek, 1997) to measure the respondents' vulnerable narcissism as a personality trait. The scale consists of 10 items (e.g., “I feel that I have enough on my hands without worrying about other people's troubles”) to which participants responded using a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The responses were averaged into a single hypersensitive narcissism composite. The scale's Cronbach's  $\alpha$  in this sample was 0.81.

**2.1.3.5. Restrictions Acceptance Survey.** The Restrictions Acceptance Survey (RAS) was developed for the purpose of this study to measure participants' acceptance of numerous limitations and restrictions related to social functioning during the pandemic. The survey consists of eight limitations (e.g., the prohibition of gatherings, closing of schools and kindergartens). The participants responded by assessing their opinions about each restriction on a scale ranging from 1 (*definitely unnecessary and excessive*) to 5 (*definitely needed and important*). Responses were averaged into the RAS composite. Cronbach's  $\alpha$  of this measure was 0.91.

**2.2. Results**

In the first set of analyses we wanted to determine the SRCHQ's reliability and internal structure. Initially, the SRCHQ comprised six items. After analyzing the scale's internal consistency and item-rest correlations, we excluded two items. Cronbach's  $\alpha$  for the four-item scale was satisfactory ( $\alpha = 0.77$ ) and item-rest correlations ranged from 0.46–0.71. The confirmatory factor analysis for the one-factor solution turned out to fit the data well ( $\chi^2 = 2.38, df = 2, p = .304, CFI = 1.00, TLI = 0.999, RMSEA = 0.019$ ), with this factor explaining 55.7% of variance. All factor loadings were greater than 0.49, with most above 0.75. Additional information on the reliability, factor loadings and excluded items can be found in the *Supplemental materials*.

Since the variable distribution of the SRCHQ and the RAS did not meet normality assumptions (skewness of  $-2.19$  and kurtosis of  $6.94$  for SRCHQ; skewness of  $-2.61$  and kurtosis of  $8.98$  for RAS), we applied

nonparametric tests including Spearman's  $\rho$  and Spearman's partial correlation, in further analyses (Bishara & Hittner, 2015).

As SRCHQ is a new scale, we first wanted to determine whether it is related to demographic variables. We calculated differences in SRCHQ levels by sex, age, education level, place of residence, and parental status. The Kruskal-Wallis test showed differences in the SRCHQ by gender and parental status. The SRCHQ level was significantly higher among women ( $M = 18.81, SD = 1.57$ ) than among men ( $M = 17.94, SD = 2.56; \chi^2 = 14.7, df = 1, p < .001, \epsilon^2 = 0.029$ ). Moreover, it was also significantly higher among parents ( $M = 18.72, SD = 1.81$ ) than among non-parents ( $M = 18.26, SD = 2.24; \chi^2 = 7.32, df = 1, p < .01, \epsilon^2 = 0.014$ ); however, these effects were relatively weak. No significant differences in SRCHQ levels were found among other demographic characteristics (i.e., age, place of residence, and education level).

To analyze the relationship between SRCHQ and the self-focused variables with the acceptance of restrictions, we calculated Spearman's  $\rho$  zero-order and partial correlation coefficients (Table 1). The results were controlled for false discovery rate in multiple hypotheses testing using the Benjamini-Hochberg method (Benjamini & Hochberg, 1995), indicating the robustness of all the correlation coefficients marked as statistically significant.

The results showed statistically significant positive zero-order correlations between SRCHQ and RAS. Each of the pandemic-related worries scales was also significantly and positively associated with RAS. Simultaneously, the correlation of SRCHQ with RAS was stronger than the correlation of RAS with the Health Worries Scale and Material Worries Scale ( $z = 3.67, p < .001, z = 7.71, p < .001$ , respectively). The partial correlation of SRCHQ and RAS and that of Health Worries Scale and RAS, while simultaneously controlling for the effect of the remaining predictors, were significant (the first being also significantly stronger than the latter;  $z = 7.72, p < .001$ ). Neither HSNS nor NPI-13 was uniquely related to the acceptance of restrictions.

**2.3. Discussion**

In the current study, we introduced the concept of context-specific individual differences in the sense of responsibility for collective health (SRCH) to understand to what extent people are concerned about other's health during the pandemic and feel obliged to contribute to contain the spread of the virus in one's social environment. The results showed that the SRCHQ was a reliable measure and was confirmed a significant predictor of the participants' acceptance of restrictions what simultaneously indicate its construct validity. Thus, focusing on others during the pandemic, expressed by feeling concern for others' health and feeling obliged to participate in stopping the pandemic may facilitate a more favorable evaluation of the need to introduce restrictions aimed at containing the pandemic. It may indicate that people high in SRCH can be ready to resign from parts of their freedom during the pandemic to

**Table 1**

Spearman's  $\rho$  zero-order correlations between all the measures included in the study and Spearman's partial correlations between Restrictions Acceptance Survey (RAS) and all predictors' measures, with the Benjamini-Hochberg correction for multiple comparisons.

	M	SD	1	2	3	4	5	6	1
									Partial correlation
1. RAS	4.68	0.53	–						–
2. SRCHQ	4.61	0.52	0.52***	–					0.38***
3. Health Worries Scale	4.13	0.75	0.40***	0.64***	–				0.10*
4. Material Worries Scale	3.36	0.91	0.15***	0.29***	0.41***	–			–0.02
5. HSNS	2.92	0.67	–0.05	–0.02	0.11*	0.26***	–		–0.05
6. NPI	2.79	0.64	–0.01	–0.05	0.02	0.08	0.12**	–	0.02

Note. RAS = Restrictions Acceptance Survey; SRCHQ = Sense of Responsibility for Collective Health Questionnaire; HSNS = Hypersensitive Narcissism Scale; NPI = Narcissistic Personality Inventory.

Partial correlation refers to a variable's correlation with RAS while controlling for all other predictors.

\*  $p < .05$ .  
 \*\*  $p < .01$ .  
 \*\*\*  $p < .001$ .

protect themselves and others from getting infected with the virus.

The findings also showed that worries about one's own and close others' health, considered here as a context-specific but self-oriented tendency, explained unique variance in the criterion variable. Simultaneously, it turned out that SRCH was a stronger predictor of the acceptance of restrictions than health worries. In conjunction with the lack of significant relationships of both kinds of narcissism (classified here as self-oriented personality traits) with the acceptance of restrictions, these results show that the measure indicating a higher focus on others and common good may be more important for predicting attitude towards health-protecting measures during the pandemic than measures indicating a focus on one's own perspective. Simultaneously, the results revealed that both context-specific individual differences are highly useful predictors of the acceptance of pandemic-related restrictions.

### 3. Study 2

As the pandemic progressed, it became crucial to adhere to prescribed norms, especially two kinds of behavior that directly affected the spread of COVID-19, which are, increased hygiene and social distancing. Thus, Study 2 aimed to determine the predictive value of SRCH in engagement in hygiene and social distancing.

Study 1 compared the predictive value of SRCH with that of pandemic-related worries (as context-specific, self-oriented individual differences) and with grandiose and vulnerable narcissism (as self-oriented traits). In Study 2, we tested our model by adding a personality trait indicating a strong orientation towards other people. Therefore, we chose the variable of social responsibility personal values, which represents a general value-based foundation of civic engagement (Syvertsen et al., 2015).

We expected that SRCH would better predict the dependent variables than social responsibility values because of the former's context specificity to the pandemic situation. As the current pandemic is a collective problem, we expected that the individual differences in SRCH and social responsibility personal values, both of which are others-oriented individual factors, would be better predictors of health-protective behaviors during the pandemic than individual differences in pandemic-related worries and narcissistic traits, both of which are self-oriented personality variables.

#### 3.1. Method

##### 3.1.1. Participants and procedure

A total of 248 participants from the Polish-speaking sample participated in the second study (57,2% female). Data were obtained using the Ariadna research panel. The data of 35 participants were excluded due to their short response time (shorter than 5 min) or automated, invalid responses, resulting in a final sample of 213 participants (63,8% female). A sensitivity analysis using *G\*Power* software (Faul et al., 2009), indicated that given an alpha of 0.05, and an assumed power of 0.95, our sample is appropriate for detecting a minimum effect of  $f^2 = 0.05$ . The study sample was approximating Polish population proportions with regard to education and place of residence. Detailed demographic information is presented in *Supplemental materials*. The second study was conducted between April 29–May 8, 2020, when some of the restrictions were withdrawn, while citizens were still obliged to wear masks in public spaces.

##### 3.1.2. Ethical procedures

The procedure for Study 2 was congruent with that of Study 1, as described above. The respondents were invited to participate in a self-report study via email. Participants provided informed consent and completed all the supplied questionnaires. All data collection procedures were reviewed and approved by Ethics Committee at the Institute of Psychology, University of Wrocław.

#### 3.1.3. Measures

**3.1.3.1. Sense of Responsibility for Collective Health Questionnaire.** As in Study 1, we used the SRCHQ to measure individual differences in SRCH. However, the scale was slightly modified. One item was changed to highlight the “ought self” aspect (the item: “It is important to follow the recommendations enforced in the country so as not to infect others” was changed to: “I believe that I should follow the recommendations enforced in the country, as it is important for the containment of the COVID-19 pandemic”). Composite scores of the SRCHQ were calculated by averaging participants' responses (Cronbach's  $\alpha = 0.82$ ).

**3.1.3.2. Pandemic-Related Worries Survey.** In this study, pandemic-related worries were measured using a shortened version of the PRWS, comprising six items instead of eight. The information about the excluded items can be found in the *Supplemental materials*. The scale's items referred to both the respondents' worry about the possibility of contracting COVID-19 and the worry about the possible deterioration of one's material situation. Due to satisfactory internal reliability of the scale (Cronbach's  $\alpha = 0.75$ ), the results in all items were treated as a single scale and averaged to compute a composite score.

**3.1.3.3. Hypersensitive Narcissism Scale.** As in the first study, to measure vulnerable narcissism, we used the Polish translation of the HSNS (Hendin & Cheek, 1997). In this study, Cronbach's  $\alpha$  was 0.76. The responses were averaged into a single hypersensitive narcissism composite.

**3.1.3.4. Narcissistic Personality Inventory.** We used a shorter scale to measure grandiose narcissism. We chose the modified Polish adaptation of the 13-item NPI (NPI-13; Gentile et al., 2013; Żemojtel-Piotrowska et al., 2018). The Polish version of the NPI-13 is an abbreviated form of the full version, that is, NPI-40 (Raskin & Hall, 1988). It comprises 13 items, which are indicative of high narcissism and assessed on a 7-point scale ranging from 1 (*I strongly disagree*) to 7 (*I strongly agree*) (as opposed to the original version, which has a binary system of responses in which the participants choose one of two statements indicating high or low narcissism). The results were averaged to compute a composite scores of grandiose narcissism. The Cronbach's  $\alpha$  coefficient in this study was 0.90.

**3.1.3.5. Social Responsibility Personal Values Scale.** To measure social responsibility personal values, we used the Polish translation of three items from the 4-item Social Responsibility Personal Values Scale (SRPVS; Syvertsen et al., 2015), as this scale measures prosocial and civic engagement. The participants responded to the three items (“It is important to me to consider the needs of other people”; “It is important to me to make sure that all people are treated fairly”; “It is important to me to think about how my actions affect people in the future”) on a 5-point scale ranging from 1 (*not at all important*) to 5 (*extremely important*). Responses to each item were averaged to calculate composite scores (Cronbach's  $\alpha = 0.76$ ).

**3.1.3.6. Hygiene Routines Survey and Social Distancing Practices Survey.** The hygiene routines were measured using the Hygiene Routines Survey (HRS), based on a part of the survey by Oosterhoff & Palmer, 2020 concerning disinfecting behaviors. The HRS describes five behaviors including washing and disinfecting one's hands, covering one's nose and mouth in public, disinfecting one's phone, and wearing protective gloves (e.g., “In the past seven days, I have washed my hands for at least 20 s after touching surfaces that may have been contaminated with the virus”). The participants were asked about how often they performed those behaviors during the 7-day period preceding the survey, on a scale ranging from 1 (*never*) to 6 (*always*). The responses were averaged to compute composite HRS scores. Cronbach's  $\alpha = 0.73$ .

The Social Distancing Practices Survey (SDPS) was also based on a part of the survey by Oosterhoff & Palmer, 2020. It comprises eight possible behaviors, including keeping a safe distance, refraining from going to crowded places or supermarkets, refraining from meeting friends or talking to neighbors "face to face", and greeting other people without physical contact (e.g., "I have kept a 2-m distance in public spaces"; "I have greeted others without physical contact"). On a scale ranging from 1 (never) to 6 (always), the participants indicated the frequency with which they performed these behaviors during the 7-day period preceding the survey. The responses were averaged to create a composite SDPS scores (Cronbach's  $\alpha = 0.92$ ).

3.2. Results

The variable distribution analysis in Study 2 revealed a slightly inflated skewness of SDPS (-1.18) and SRCHQ (-1.03), while kurtosis ranged between -0.49-1.29. In this study, we used the Box-Cox transformation (Bishara & Hittner, 2015; Box & Cox, 1982; Sakia, 1992) for better satisfaction of the theoretical assumptions made in the parametric analyses. As a result, the absolute skewness values were acceptable ( $\leq 1$ ; George & Mallery, 2010), allowing the use of parametric tests. There were no significant differences in SRCHQ levels by sex, age, education level, place of residence, or parental status.

We found significant zero-order positive correlations of hygiene and social distancing practices with SRCHQ, SRPVS, and PRWS. NPI-13 was negatively correlated with social distancing practices, whereas HSNS was not significantly related to either of the dependent variables (Table 2). However, when the zero-order and partial correlations were controlled for false discovery rate in multiple hypotheses testing using the Benjamini-Hochberg method (Benjamini & Hochberg, 1995), the initially significant partial correlation between social distancing and SRPVS was found to be subject to an elevated risk of type I error. This indicated that the probability that the result was obtained by chance was greater than the assumed 5%.

In the two separate four-step hierarchical multiple regressions, we tested the effects of each predictor on social distancing and hygiene (Table 3). The Durbin-Watson test for autocorrelation was 1.99, suggesting no autocorrelations among the variables. The test of the assumption of collinearity indicated that multicollinearity was not a concern (variance inflation factor [VIF] ranged from 1.12-1.42). Moreover, we did not find significant outlier values within the sample (Cook's Distance  $M = 0.006$  and  $Max = 0.28$ ). The Breush-Pagan test for heteroscedasticity was not significant ( $p = .102$ ). Thus, the variables met the assumptions required for multiple linear regression. To verify whether self-oriented traits account for the unique variance in social distancing and hygiene, in Step 1 of the analysis we entered HSNS and

Table 2

Pearson's zero-order correlations between all the measures included in the study and partial correlations between Hygiene Routines Survey (HRS) and Social Distancing Practices Survey (SDPS) with all predictors' measures, with the Benjamini-Hochberg correction for multiple comparisons.

	M	SD	1	2	3	4	5	6	7	1 Partial correlation	2 Partial correlation
1. HRS	3.50	0.77	-							-	0.41***
2. SDPS	5.09	0.91	0.54***	-						0.41***	-
3. SRCHQ	4.31	0.70	0.41***	0.63***	-					0.25***	0.52***
4. SRPVS	3.92	0.67	0.25***	0.38***	0.44***	-				0.10	0.15
5. PRWS	3.09	0.76	0.41***	0.19**	0.25***	0.07	-			0.35***	0.06
6. HSNS	3.09	0.55	0.02	-0.05	-0.07	-0.11	0.18*	-		-0.01	0.01
7. NPI-13	3.21	0.99	-0.13	-0.23***	-0.28***	-0.16*	0.03	0.26***	-	-0.05	-0.07

Note. HRS = Hygiene Routines Survey; SDPS = Social Distancing Practices Survey; SRCHQ = Sense of Responsibility for Collective Health Questionnaire; SRPVS = Social Responsibility Personal Values Scale; PRWS = Pandemic-Related Worries Scale; HSNS = Hypersensitive Narcissism Scale; NPI = Narcissistic Personality Inventory.

Partial correlation 1 refers to a variable's correlation with HRS while controlling for all the other predictors; Partial correlation 2 refers to a variable's correlation with SDPS while controlling for all the other predictors.

\*  $p < .05$ .  
 \*\*  $p < .01$ .  
 \*\*\*  $p < .001$ .

Table 3

Hierarchical regression models with the results of narcissistic personality questionnaires (HSNS and NPI-13), Social Responsibility Personal Values Survey (SRPVS), Pandemic-Related Worries Survey (PRWS) and Sense of Responsibility for Collective Health Questionnaire (SRCHQ) as predictors of social distancing and hygiene during the COVID-19 pandemic with the Benjamini-Hochberg correction for multiple comparisons.

	Social distancing			Hygiene		
	$\beta$	t	p	$\beta$	t	p
Model 1						
Intercept		6.94	<0.001		11.61	<0.001
HSNS	0.011	0.15	0.880	0.050	0.72	0.475
NPI-13	-0.228	-3.28	0.001	-0.139	-1.97	0.051
Model Fit	$R^2 = 0.051$ ; $F(2, 210) = 5.64$ ; $p = .004$			$R^2 = 0.018$ ; $F(2, 210) = 1.96$ ; $p = .144$		
Model 2						
Intercept		0.67	0.507		5.19	<0.001
HSNS	0.038	0.58	0.565	0.069	0.99	0.321
NPI-13	-0.179	-2.73	0.007	-0.107	-1.53	0.127
SRPVS	0.357	5.59	<0.001	0.238	3.52	<0.001
Model Fit	$R^2 = 0.174$ ; $\Delta R^2 = 0.124$ ; $F(3, 209) = 14.73$ ; $p < .001$			$R^2 = 0.073$ ; $\Delta R^2 = 0.055$ ; $F(3, 209) = 5.50$ ; $p = .001$		
Model 3						
Intercept		-0.06	0.950		3.79	<0.001
HSNS	0.004	0.06	0.952	-0.009	-0.14	0.887
NPI-13	-0.179	-2.76	0.006	-0.105	-1.64	0.102
SRPVS	0.340	5.39	<0.001	0.200	3.21	0.002
PRWS	0.173	2.73	0.007	0.400	6.42	<0.001
Model Fit	$R^2 = 0.203$ ; $\Delta R^2 = 0.029$ ; $F(4, 208) = 13.25$ ; $p < .001$			$R^2 = 0.226$ ; $\Delta R^2 = 0.153$ ; $F(4, 208) = 15.22$ ; $p < .001$		
Model 4						
Intercept		-3.57	<0.001		4.03	<0.001
HSNS	-0.011	-0.17	0.867	-0.005	-0.09	0.931
NPI-13	-0.053	-0.93	0.356	-0.044	-0.69	0.487
SRPVS	0.126	2.12	0.035	0.097	1.46	0.146
PRWS	0.047	0.83	0.405	0.339	5.42	<0.001
SRCHQ	0.552	8.75	<0.001	0.265	3.78	<0.001
Model Fit	$R^2 = 0.418$ ; $\Delta R^2 = 0.215$ ; $F(5, 207) = 29.79$ ; $p < .001$			$R^2 = 0.276$ ; $\Delta R^2 = 0.050$ ; $F(5, 207) = 15.81$ ; $p < .001$		

Note. HSNS = Hypersensitive Narcissism, NPI-13 = Narcissistic Personality Inventory, SRCHQ = Sense of Responsibility for Collective Health Questionnaire, SRPVS = Social Responsibility Personal Values Scale, PRWS = Pandemic Related Worries Survey.

NPI-13 (Model 1). Then in Step 2 we entered SRPVS as an others-oriented trait (Model 2). In the next stages we entered context-specific measures. In Step 3 we added PRWS as a self-oriented context-specific measure (Model 3). In the final step (Model 4), we included SRCHQ as our focal, others-oriented, and context-specific measure.

The results of the analysis showed significant effects of NPI-13 (at

Steps 1, 2 and 3), PRWS (only at Step 3), SRCHQ, and SRPVS on social distancing. As indicated by the results of Model 4, SRCHQ was the strongest predictor of social distancing ( $\beta = 0.552$ ), followed by SRPVS ( $\beta = 0.126$ ). Despite a significant effect at earlier steps of the analysis, PRWS and NPI-13 no longer predicted social distancing when SRCHQ was included in the equation. SRCHQ as a predictor at the final step of the analysis explained 21.5% of the unique variance in social distancing.

The results of the analogous analysis with hygiene as the dependent variable revealed significant effects of SRPVS (only at Steps 2 and 3), PRWS, and SRCHQ. According to the results in Model 4, the strongest predictor of hygiene was PRWS ( $\beta = 0.339$ ), followed by SRCHQ ( $\beta = 0.265$ ). Unlike the significant effect at earlier steps of the analysis, SRPVS no longer displayed significant associations with increased hygiene when SRCHQ was included in the equation. Adding SRCHQ as a predictor in Model 4 explained 5% of unique variance in hygiene. The multiple regression results were controlled for the false discovery rate in multiple hypotheses testing using the Benjamini-Hochberg method (Benjamini & Hochberg, 1995). According to the results, the significance of all regressions was robust.

When the order of the steps in the hierarchical regression was flipped, SRCHQ alone accounted for 40.2% of the variance in social distancing, whereas PRWS and traits measures accounted for only 1.6%. SRCHQ alone explained 16.5% of the variance in hygiene, while PRWS and traits measures accounted for 11.2% of its variance (details of the additional regressions are reported in the *Supplemental materials*).

### 3.3. Discussion

The results of our research suggest that social distancing and hygiene are best predicted by different sets of predictors. SRCH turned out to be the strongest predictor of social distancing. The second statistically significant predictor revealed in hierarchical multiple regressions was SRPV. These findings show that social distancing is best predicted by others-oriented variables. However, the paramount predictive value of SRCH indicates that when the focus on others is specifically related to concern for collective health during the pandemic, it can strengthen one's motivation to physically distance from other people during the pandemic, more than adherence to social responsibility values would.

In turn, hygiene is best predicted by PRW, followed by SRCH. The result suggests that hygiene is best predicted by a variable that is self-oriented. Common to both significant predictors of hygiene (i.e., PRW and SRCH) is that they are context-specific, thereby confirming the utility of such kind of personality variables in predicting behavioral outcomes during the pandemic.

Interestingly, SRCH can predict both kinds of pandemic-mitigating behaviors, what confirms that the concern for the health of others in one's social environment results in a high consistency in following health-related guidelines during the pandemic.

## 4. General discussion

The present study demonstrated that individual differences in SRCH are a robust predictor of health-related behavior during the pandemic. Besides, SRCHQ turned out to be a reliable measure of SRCH. Furthermore, the associations of SRCHQ with the acceptance of pandemic-related restrictions as well as with social distancing practices and increased hygiene during the pandemic indicate its construct validity.

We introduced the concept of SRCH after analyzing the specific context of the COVID-19 pandemic. It led us to assume that what should mostly facilitate compliance with pandemic containing measures is the individual's concern for collective health and feeling obliged to contribute to suppress the pandemic. Such an approach expresses individual's orientation towards their social environment and is specifically related to the pandemic situation. The results confirmed that SRCH as an others-oriented and context-specific kind of variable predicted unique variance in attitudes and each health-related behavior

measured, after controlling for variables indicating a self-focused orientation (including personality traits, represented by narcissistic traits, and individual differences in pandemic-related worries) as well as for an others-focused orientation (i.e., social responsibility values).

Importantly, SRCH as a predictor of social distancing—a critical factor for containing the pandemic on a societal level (Anderson et al., 2020)—outperformed pandemic-related worries (a context-specific but self-focused variable). The considerable strength of the relationship between SRCH and adherence to pandemic-related social distancing rules may indicate that people who are concerned about collective health and feel obliged to contribute to contain the pandemic, can refrain from being physically close to others to mitigate the spread of the virus. This may suggest that such individuals are ready to resign from fulfilling part of their social needs and freedoms to protect themselves and others from infection; moreover, they do so more consistently than people with high levels of pandemic-related worries.

However, pandemic-related worries that involve high self-focus were found to be the best predictors of hygiene practices (although still leaving SRCH a significant predictor). It may be explained by the fact that hygiene practices can be perceived as directly serving the purpose of protecting oneself and close others from contracting the virus. At the same time, when people's concerns entail a high degree of self-focus rather than a focus on others, they might be motivated to comply with health standards mostly when the situation is perceived as dangerous for their own and their close others' health. This would explain why pandemic-related worries were less strongly related to social distancing. When other people do not manifest symptoms of the disease (which can directly activate fear of infection), even high levels of pandemic-related worries are less likely to provoke avoidance of contact with people. In addition, strict maintenance of social distance could deprive people of the opportunity to alleviate stress by affiliating with others, which people tend to do when they are in a state of anxiety or worry (Schachter, 1959). In this respect, experiencing pandemic-related worries could hinder the willingness to distance from others during the pandemic.

The results of this study indicate that although both others-oriented and self-oriented variables can predict some of the health-related behaviors during the pandemic, an others-oriented variable represented by SRCH was found to be a consistent predictor of the examined outcomes. By highlighting the importance of focusing on other people during the pandemic, our findings confirm the results of other studies indicating that thinking in terms of others can contribute to higher levels of compliance with pandemic-related restrictions. During the pandemic, this thinking pattern may be specifically related to the fear of infecting others (Leary et al., 2020). However, a more general manifestation of orientation towards others may also matter during the pandemic. For example, prosociality (willingness to sacrifice their own profits for the sake of others) was related to engagement in health-related behaviors (Campos-Mercade et al., 2020). Other findings revealed also the role of empathy in promoting motivation to adhere to social distancing (Pfafftheicher et al., 2020); further, invoking a sense of civic duty (i.e., responsibility for protecting others) was found to be an effective (although of modest strength) way of increasing readiness to adopt health-protection habits during the pandemic (Everett et al., 2020).

Our results also demonstrate that applying context-specific measures to predict precautionary behavior during the COVID-19 pandemic is beneficial, which is in line with the social-cognitive approach to personality. This approach suggests that measuring beliefs and self-perception in relation to social situations is most effective in predicting specific behavior (Bandura, 2001, 2012). In our studies, this finding was clearer when we assessed the contribution of narcissistic traits in explaining of variance in health-related behavior. For example, although grandiose narcissism was significantly negatively correlated with social distancing, this personality trait no longer predicted social distancing after controlling for context-specific predictors. This may suggest that the diminished willingness to adhere to social distancing among



individuals with narcissistic traits is specifically related to their decreased level of responsibility for protecting others from possible infection. Furthermore, the contribution of SRPV in predicting social distancing was diminished (as suggested by multiple regression analysis) or has become even less valid (as suggested by partial-correlation analysis) when all predictors in the model, including SRCH, were controlled. Coupled with the observation that SRPV no longer predicted hygiene when controlling for SRCH, this finding suggests that when being others-oriented is grounded in a specific context, it may facilitate a higher consistency in behavior relevant to that context. In the case of current pandemic: the concern for collective health consistently predicted both prescribed kinds of pandemic-mitigating behaviors.

#### 4.1. Limitations and future directions

Both of our studies have limitations that need to be considered. First, the correlational design precludes any causal inferences, that may require experimental investigation. Secondly, the SRCHQ was used for the first time in the current studies, thus further investigation of the scale would be needed. Additionally, self-reported measures of health-related behaviors, social responsibility values, and SRCH may result in the social desirability bias. This might be the reason for high scores on these measures. However, other studies conducted around the same time have also confirmed a high level of acceptance of precautionary measures during the pandemic (Maj & Skarżyńska, 2020) and a very high adherence to them (Maj & Skarżyńska, 2020; Oosterhoff & Palmer, 2020; Zajenkowski et al., 2020), which could suggest that this bias might not be a factor.

Since the SRCHQ and RAS scores in Study 1 were highly skewed, only a part of a continuum of these variables was explored, thus restricting the generalizability of the results of this study. It is noteworthy that in Study 2 which was conducted when the pandemic was decreasing, the results of SRCHQ were only slightly skewed. It may indicate that the results obtained in Study 1 might have been affected by high levels of concern for the pandemic spread, associated with a high readiness for the acceptance of limitations posed on citizens. SRCH explained unique variance in compliance with health recommendations during the pandemic after controlling for some context-specific individual differences and traits. However, the predictive power of SRCH as against other variables is yet to be examined. Other variables can be considered in future research to represent the others-oriented category, such as Agreeableness—one of the Five-Factor traits, or Collectivism/Individualism. In turn, self-oriented personality traits could be measured by psychopathy and Machiavellianism representing the Dark Triad traits of personality. Apart from testing the predictive power of SRCH, future studies can examine how SRCH is related to other variables which indicate others-directed orientation, such as benevolence and universalism values (Schwartz et al., 2012) or identification with all humanity (McFarland et al., 2013).

We believe that the idea of identifying variables that represent one's level of concern and responsibility in a broader context can be applied in future studies. For example, there may be variance in the sense of personal responsibility for other pressing societal or environmental issues. Thus defining, measuring, and studying the sense of personal responsibility in relation to actual behaviors may further our understanding of social and environmental engagement.

#### 4.2. Practical implications

As the measure of individual differences in SRCH was found to be a robust predictor of health-related behavior, it can be applied in practice. First, it can be used to predict a person's level of readiness to adopt behaviors that contribute to the collective effort to control a pandemic. Second, as the SRCHQ is concise, it can be easily applied to monitor health-protecting attitudes in groups. Based on our results, we expect that a decrease in SRCH could be accompanied by decreased compliance

with health recommendations. Due to the correlational design of our studies, possible practical applications concerning cues for developing messages that encourage the public to adopt a health-protecting mindset based on SRCH should be confirmed by experimental studies.

#### 4.3. Conclusions

By introducing the concept and the measure of individual differences in the sense of responsibility for collective health, this study contributes to the knowledge about personality predictors of health-related attitudes and behaviors during the pandemic. The SRCH as a context-specific and others-oriented variable turned out to be a robust, positive predictor of the acceptance of COVID-19-related restrictions and applying the COVID-19 containing practices, like social distancing and increased hygiene. The findings also showed that pandemic-related worries as the other variable specifically related with the current pandemic, but of self-oriented kind, significantly predicted engaging in hygiene practices during the pandemic. These results indicate the significance of measuring and developing context-specific personality variables in predicting an individual's health-related attitude and behavior during the pandemic.

#### CRediT authorship contribution statement

**Kinga Lachowicz-Tabaczek:** Conceptualization, Funding acquisition, Methodology, Project administration, Supervision, Writing – original draft, Writing – review & editing. **Monika A. Kozłowska:** Resources, Data curation, Formal analysis, Investigation, Writing – original draft, Writing – review & editing.

#### Declaration of competing interest

None.

#### Acknowledgments

The publication was partially financed by the program "Excellence Initiative - Research University" at University of Wrocław, Poland.

#### Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.paid.2021.111138>.

#### References

- Allington, D., Duffy, B., Wessely, S., Dhavan, N., & Rubin, J. (2020). Health-protective behaviour, social media usage and conspiracy belief during the COVID-19 public health emergency. *Psychological Medicine*, 1–7. <https://doi.org/10.1017/S003329172000224X>.
- Anderson, R. M., Heesterbeek, H., Klinkenberg, D., & Hollingsworth, T. D. (2020). How will country-based mitigation measures influence the course of the COVID-19 epidemic? *The Lancet*, 395, 931–934. [https://doi.org/10.1016/S0140-6736\(20\)30567-5](https://doi.org/10.1016/S0140-6736(20)30567-5).
- Aron, A., & Fraley, B. (1999). Relationship closeness as including other in the self: Cognitive underpinnings and measures. *Social Cognition*, 17(2), 140–160. <https://doi.org/10.1521/soco.1999.17.2.140>.
- Aschwanden, D., Strickhouser, J. E., Sesker, A. A., Lee, J. H., Luchetti, M., Stephan, Y., ... Terracciano, A. (2020). Psychological and behavioural responses to coronavirus disease 2019: The role of personality. *European Journal of Personality*. <https://doi.org/10.1002/per.2281> (Advance online publication).
- Bai, Y., Yao, L., Wei, T., Tian, F., Jin, D.-Y., Chen, L., & Wang, M. (2020). Presumed asymptomatic carrier transmission of COVID-19. *JAMA*, 323(14), 1406–1407. <https://doi.org/10.1001/jama.2020.2565>.
- Bandura, A. (2001). Social cognitive theory: An agentic perspective. In *Vol. 52(1). Annual review of psychology* (pp. 1–26). Palo Alto, CA: Annual Reviews.
- Bandura, A. (2012). On the functional properties of perceived self-efficacy revisited. *Journal of Management*, 38(1), 9–44. <https://doi.org/10.1177/0149206311410606>.
- Bavel, J. J. V., Baicker, K., Boggio, P. S., Capraro, V., Cichocka, A., Cikara, M., ... Willer, R. (2020). Using social and behavioural science to support COVID-19 pandemic response. *Nature Human Behaviour*, 4(5), 460–471. <https://doi.org/10.1038/s41562-020-0884-z>.

- Bazińska, R., & Drat-Ruszczak, K. (2000). Struktura narcyzmu w polskiej adaptacji kwestionariusza NPI Ruskina i Halla. [The structure of narcissism in Polish adaptation of Raskin's & Hall's NPI]. *Czasopismo Psychologiczne*, 6(3), 171–188.
- Benjamini, Y., & Hochberg, Y. (1995). Controlling the false discovery rate: A practical and powerful approach to multiple testing. *Journal of the Royal Statistical Society. Series B (Methodological)*, 57(1), 289–300.
- Bishara, A. J., & Hittner, J. B. (2015). Reducing bias and error in the correlation coefficient due to nonnormality. *Educational Psychological Measurement*, 75(5), 785–804.
- Blagov, P. S. (2020). Adaptive and dark personality in the COVID-19 pandemic: Predicting health-behavior endorsement and the appeal of public-health messages. *Social Psychological and Personality Science*. <https://doi.org/10.1177/1948550620936439>.
- Box, G. E. P., & Cox, D. R. (1982). An analysis of transformation revisited, rebutted. *Journal of the American Statistical Association*, 77, 209–210.
- Buelow, M. T., & Brunell, A. B. (2014). Facets of grandiose narcissism predict involvement in health-risk behaviors. *Personality and Individual Differences*, 69, 193–198.
- Campos-Mercade, P., Meier, A. N., Schneider, F. H., & Wengström, E. (2020). Prosociality predicts health behaviors during the COVID-19 pandemic. In 346. *Working paper series*. Department of Economics, University of Zurich. <https://doi.org/10.5167/uzh-187672>.
- Caprara, G. V., Barbaranelli, C., Pastorelli, C., & Cervone, D. (2004). The contribution of self-efficacy beliefs to psychosocial outcomes in adolescence: Predicting beyond global dispositional tendencies. *Personality and Individual Differences*, 37(4), 751–763. <https://doi.org/10.1016/j.paid.2003.11.003>.
- Cervone, D., Shadel, W. G., & Jencius, S. (2001). Social-cognitive theory of personality assessment. *Personality and Social Psychology Review*, 5, 33–51.
- Clark, C., Davila, A., Regis, M., & Kraus, S. (2020). Predictors of COVID-19 voluntary compliance behaviors: An international investigation. *Global Transitions*, 2, 76–82. <https://doi.org/10.1016/j.glt.2020.06.003>.
- Engle, S., Stromme, J., & Zhou, A. (2020). Staying at home: Mobility effects of COVID-19. In *Working paper*. <https://doi.org/10.2139/ssrn.3565703>.
- Everett, J. A., Colombatto, C., Chituc, V., Brady, W. J., & Crockett, M. J. (2020). The effectiveness of moral messages on public health behavioral intentions during the COVID-19 pandemic. In *PsyArXiv preprints*. <https://doi.org/10.31234/osf.io/9yqs8>.
- Faul, F., Erdfelder, E., Buchner, A., & Lang, A. G. (2009). Statistical power analyses using G\*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, 41, 1149–1160.
- Gentile, B., Miller, J. D., Hoffman, B. J., Reidy, D. E., Zeichner, A., & Campbell, W. K. (2013). A test of two brief measures of grandiose narcissism: The Narcissistic Personality Inventory-13 and the Narcissistic Personality Inventory-16. *Psychological Assessment*, 25(4), 1120–1136.
- George, D., & Mallery, M. (2010). *SPSS for windows step by step: A simple guide and reference, 17.0 update* (10th ed.). Pearson.
- Harper, C. A., Satchell, L. P., Fido, D., & Litzman, R. D. (2020). Functional fear predicts public health compliance in the COVID-19 pandemic. *International Journal of Mental Health and Addiction*, 1–14. <https://doi.org/10.1007/s11469-020-00281-5>.
- Hendin, H. M., & Cheek, J. M. (1997). Assessing hypersensitive narcissism: A reexamination of Murray's narcissism scale. *Journal of Research in Personality*, 31(4), 588–599. <https://doi.org/10.1006/jrpe.1997.2204>.
- Holmes, E. A., O'Connor, R. C., Perry, V. H., Tracey, I., Wessely, S., Arseneault, L., & Bullmore, E. (2020). Multidisciplinary research priorities for the COVID-19 pandemic: A call for action for mental health science. *The Lancet Psychiatry*, 7(6), 547–560. [https://doi.org/10.1016/S2215-0366\(20\)30168-1](https://doi.org/10.1016/S2215-0366(20)30168-1).
- Jetten, J., Reicher, S. D., Haslam, A., & Cruwys, T. (2020). *Together apart: The psychology of COVID-19*. Los Angeles: Sage Publications.
- Johansson, M. A., Quandt, T. M., Kada, S., Prasad, P. V., Steele, M., Brooks, J. T., ... Butler, J. C. (2021). SARS-CoV-2 transmission from people without COVID-19 symptoms. *JAMA Network Open*, 4(1), Article e2035057. <https://doi.org/10.1001/jamanetworkopen.2020.35057>.
- Kissler, S. M., Tedijanto, C., Lipsitch, M., & Grad, Y. (2020). Social distancing strategies for curbing the COVID-19 epidemic. *Preprint at MedRxiv*. <https://doi.org/10.1101/2020.03.22.20041079>.
- Kraemer, M., Yang, C. H., Gutierrez, B., Wu, C. H., Klein, B., Pigott, D. M., ... Scarpino, S. V. (2020). The effect of human mobility and control measures on the COVID-19 epidemic in China. *Science*, 368(6490), 493–497. <https://doi.org/10.1126/science.abb4218>.
- Leary, A., Dvorak, R., De Leon, A., Peterson, R., & Troop-Gordon, W. (2020, May 13). *COVID-19 social distancing*. <https://doi.org/10.31234/osf.io/mszw2>.
- Maj, K., & Skarzynska, K. (2020). *Spoleczeństwo wobec epidemii. Raport z badań [Society against the pandemic. Research report]*. Warszawa, Fundacja im. Stefana Batorego.
- McFarland, S., Brown, D., & Webb, M. (2013). Identification with all humanity as a moral concept and psychological construct. *Current Directions in Psychological Science*, 22(3), 194–198. <https://doi.org/10.1177/0963721412471346>.
- Mertens, G., Gerritsen, L., Duijndam, S., Salemin, 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, Article 102258. <https://doi.org/10.1016/j.janxdis.2020.102258>.
- Miguel, F. K., Machado, G. M., Pianowski, G., & Carvalho, L. F. (2021). Compliance with containment measures to the COVID-19 pandemic over time: Do antisocial traits matter? *Personality and Individual Differences*, 168, Article 110346. <https://doi.org/10.1016/j.paid.2020.110346>.
- Miller, J. D., Hoffman, B. J., Gaughan, E. T., Gentile, B., Maples, J., & Campbell, W. K. (2011). Grandiose and vulnerable narcissism: A nomological network analysis. *Journal of Personality*, 79, 1013–1042. <https://doi.org/10.1111/j.1467-6494.2010.00711.x>.
- Mischel, W., & Shoda, Y. (1995). A cognitive-affective system theory of personality: Reconceptualizing situations, dispositions, dynamics, and invariance in personality structure. *Psychological Review*, 102(2), 246–268.
- Nowak, B., Brzóska, P., Piotrowski, J., Sedikides, C., Żemojtel-Piotrowska, M., & Jonason, P. K. (2020). Adaptive and maladaptive behavior during the COVID-19 pandemic: The roles of Dark Triad traits, collective narcissism, and health beliefs. *Personality and Individual Differences*, 167, Article 110232. <https://doi.org/10.1016/j.paid.2020.110232>.
- Oosterhoff, B., & Palmer, C. A. (2020). Attitudes and psychological factors associated with news monitoring, social distancing, disinfecting, and hoarding behaviors among US adolescents during the coronavirus disease 2019 pandemic. *JAMA Pediatrics*, 174(12), 1184–1190. <https://doi.org/10.1001/jamapediatrics.2020.1876>.
- Pfafftheicher, S., Nockur, L., Böhm, R., Sassenrath, C., & Petersen, M. B. (2020). The emotional path to action: Empathy promotes physical distancing and wearing of face masks during the COVID-19 pandemic. *Psychological Science*, 31(11), 1363–1373. <https://doi.org/10.1177/0956797620964422>.
- Raskin, R., & Hall, T. (1988). A principal-components analysis of the Narcissistic Personality Inventory and further evidence of its construct validity. *Journal of Personality and Social Psychology*, 54, 890–902.
- Sakia, R. M. (1992). The Box-Cox transformation technique: A review. *The Statistician*, 41, 169–178.
- Schachter, S. (1959). *The psychology of affiliation: Experimental studies of the sources of gregariousness*. Stanford University Press.
- Schwartz, S. H., Cieciuch, J., Vecchione, M., Davidov, E., Fischer, R., Beierlein, C., ... Konty, M. (2012). Refining the theory of basic individual values. *Journal of Personality and Social Psychology*, 103(4), 663–688. <https://doi.org/10.1037/a0029393>.
- Syvertsen, A. K., Wray-Lake, L., & Metzger, A. (2015). *Youth civic and character measures toolkit*. Minneapolis, MN: Search Institute.
- Taylor, S. (2019). *The psychology of pandemics: Preparing for the next global outbreak of infectious disease*. Cambridge Scholars Publishing.
- Taylor, S., Landry, C. A., Paluszek, M. M., & Asmundson, G. J. G. (2020). Reactions to COVID-19: Differential predictors of distress, avoidance, and disregard for social distancing. *Journal of Affective Disorders*, 277, 94–98. <https://doi.org/10.1016/j.jad.2020.08.002>.
- Tindale, L. C., Stockdale, J. E., Coombe, M., Garlock, E. S., Lau, W., Saraswat, M., ... Colijn, C. (2020). Evidence for transmission of COVID-19 prior to symptom onset. *eLife*, 9, Article e57149. <https://doi.org/10.7554/eLife.57149>.
- Wise, T., Zbozinek, T. D., Michelini, G., Hagan, C. C., & Mobbs, D. (2020). Changes in risk perception and self-reported protective behaviour during the first week of the COVID-19 pandemic in the United States. *Royal Society Open Science*, 7(9), Article 200742. <https://doi.org/10.1098/rsos.200742>.
- Wray-Lake, L., & Syvertsen, A. (2011). The developmental roots of social responsibility in childhood and adolescence. In C. Flanagan, & B. Christens (Eds.), *Vol. 134. Youth development: Work at the cutting edge. New directions for child and adolescent development* (pp. 11–25). <https://doi.org/10.1002/cd.308>.
- Zajenkowski, M., Jonason, P. K., Leniarska, M., & Kozakiewicz, Z. (2020). Who complies with the restrictions to reduce the spread of COVID-19? Personality and perceptions of the COVID-19 situation. *Personality and Individual Differences*, 166, Article 110199. <https://doi.org/10.1016/j.paid.2020.110199>.
- Żemojtel-Piotrowska, M., Piotrowski, J., Rogoza, R., Baran, T., Hitokoto, H., & Maltby, J. (2018). Cross-cultural invariance of NPI-13: Entitlement as culturally specific, leadership and grandiosity as culturally universal. *International Journal of Psychology*, 54(4), 439–447. <https://doi.org/10.1002/ijop.12487>.
- Zitek, E. M., & Schlund, R. J. (2020). Psychological entitlement predicts noncompliance with the health guidelines of the COVID-19 pandemic. *Personality and Individual Differences*, 171, Article 110491. <https://doi.org/10.1016/j.paid.2020.110491>.