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Towards a Globally Collaborative Behavioral Science: An Organizational Approach from Pandemic Psychology

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The COVID-19 pandemic is among the greatest global disruptions to civil life in modern history. To mitigate the virus spread, many countries instituted various forms of lockdown, and urged citizens to take physical distancing measures to prevent transmission, some of which may be required for years to come (Anderson, Heesterbeek, Klinkenberg, & Hollingsworth, 2020; Kissler, Tedijanto, Goldstein, Grad, & Lipsitch, 2020; Parker, Knight, & Keller, 2020). Each new pandemic is uncharted territory, and there is a paucity of research examining whether and how people can initiate or maintain such behavioral changes. Furthermore, global challenges may require globally-oriented collaborations, which in turn require organizational models that fit the situation.

The PsyCorona collaboration is a research project to examine processes involved in the COVID-19 pandemic, such as behavior that curbs virus transmission, which may implicate social norms, cooperation, and self-regulation. The study also examines psychosocial consequences of physical distancing strategies and societal lockdown, such as frustration of psychological and social needs, economic stressors, relationship strains, prejudice, psychological stress, and deteriorating mental health (e.g., Brooks et al., 2020). Related consequences were observed in past epidemics such as the 1918 flu pandemic (Dolan, 2020; Honigsbaum, 2019; Jeronimus, 2020). A global collaboration allows us to study the role of culture, and to make generalizable predictions on societal responses to virus infections. Culture may influence our living arrangements and how easily we adjust and cooperate at the societal level to mitigate virus transmission. Moreover, because the evolving coronavirus pandemic has implications for ongoing psychological and social development, we continue to track people over time.

The study was launched in March 2020, mere days after the World Health Organization (WHO) declared COVID-19 a pandemic. We took a holistic approach to this global challenge. The study assesses virus-related and lockdown-related behavior, cognition, emotion, and motivation in tens of thousands of participants in dozens of countries around the world (for details, see Kreienkamp et al., 2020). The project provides the opportunity for examining individual-level processes across diverse contexts as well as collective-level processes over time. Respondents who volunteered for the longitudinal study completed weekly follow-up assessments through mid-June, and then monthly assessments thereafter.

The initial cross-sectional survey examines basic associations and cultural differences. The longitudinal follow-ups examine changes over time. We also linked respondents' survey data with interdisciplinary databases containing information specific to their region, such as infection rates and mortality, societal characteristics, and lockdown policies. Such data can provide insight into the situational conditions that correspond with specific psychological and behavioral responses.

Cross-cultural and longitudinal analyses allow us to examine the psychological factors that guide responses to the pandemic at the individual and societal level. Disaster literature suggests vulnerability can differ by people's socioeconomic status, risk of exposure, gender and age, and whether they experience additional stressors or otherwise have scarce and/or deteriorating psychosocial resources (Rodríguez, Donner, & Trainor, 2018). Such factors may moderate psychological and behavioral change in response to the pandemic.

One hypothesis guiding the design of the PsyCorona project pertains to the phenomenon of "covid fatigue" (i.e. frustration with the restricted freedoms associated with virus containment), which is rooted in research and theory on the psychology of frustration and psychosocial need deprivation. People can experience frustration of their material needs (e.g., financial or health insecurity), but also their psychosocial needs (e.g., loneliness, freedom, boredom, see Jeronimus & Laceulle, 2017). Even when material needs are met, psychological frustrations can motivate risky behaviors or hostility to vulnerable groups (Kopetz & Orehek, 2015; Leander et al., 2020). Over time, these processes may undermine vigilance and cooperation. Societal attempts to control the pandemic may exacerbate this psychosocial frustration by undermining autonomy and inducing a sense of social isolation. Thus, the very psychological consequences of trying to control the pandemic can deprive people's psychological needs and drive unfavorable developmental trajectories. Our research group prepared manuscripts guided by this perspective.

Organization and operations

PsyCorona is a spontaneous and informal collaboration of academics of all career stages from 37 countries. The project was centrally organized, but the scientific operations were spread across the network of collaborators. We took a rolling start to first initiate data collection and then develop the organization in real-time. A core team coordinated survey design, data collection, collaboration and communications (via virtual meetings, shared drive, Slack, GitHub, and email). Using a hub-and-spoke organizational design, the core team coordinated with an international network of researchers to provide survey translations, data collection, documentation, and feedback. Each national team implemented their own plan to disseminate the survey link in their region of responsibility.

The rest of the organization was developed while data were being collected. A data management team was formed to aggregate, protect, and prepare the data for analysis, as well as to identify unique issues that arise in data collection across cultures, including response sets and equivalence of measurement (Gelfand, Raver, & Ehrhart , 2002; Henrich, Heine, & Norenzayan, 2010). A data science team gathered COVID-relevant databases and integrated them with the survey data, and an internal board was formed to manage scientific output. In addition to the above, multiple project managers and senior scientific strategists provided flexible support. By the time the vast majority of the data were collected, the data management team and data science team and internal board were ready to invite collaborators to self-organize into manuscript teams to submit analysis proposals.

The first twelve weeks of the collaboration were intensive to adequately assess early public reactions to the pandemic. While bilingual collaborators translated the survey and distributed the survey link, other collaborators managed quality control, prepared documentation, and applied for funding to boost data collection in several countries to ensure age-gender representativeness because, at the time of the study, age and (male) gender were identified as vulnerability factors (Centers for Disease Control and Prevention, 2020; Wenham et al., 2020). These rapid efforts resulted in responses from approximately 60,000 participants globally. After completing the cross-sectional survey, participants were invited to sign up for the longitudinal component of the study. Each follow-up assessment typically received 4,000+ responses. While these research efforts were ongoing, the internal board started reviewing data analysis proposals for rigor and conceptual uniqueness. To address the urgency of the times, the data management team created an online data visualization tool to provide public access to portions of the data (aggregated at the country-level; see psycorona.org/data).

What can we learn from this large-scale, collaborative, and rapid research endeavor?

In addition to the substantive research findings emerging from this project, PsyCorona is instructive with regard to research processes and organizational management. Conducting rapid research with distributed work teams is inherently risky. Members of the research team had some operational experience from conducting rapid response surveys in the wakes of violent events, but nothing on this scale. It requires researchers to do the work using only existing infrastructure – and do so over and above their various other obligations (at work and at home). We treated time as a resource, but time pressure and intensity also increased risk of costly errors, delays, or disruptions. All these risks had to be attenuated through, for instance, open and transparent procedures and documentation, a climate of inclusiveness and error detection, and situational responsiveness. For example, two independent institutions maintained redundant survey infrastructure to ensure the continuation of the project in the event that one institution was disabled (Univ. Groningen & New York University – Abu Dhabi). Rapid research inherently raises concerns for a speed-accuracy tradeoff and thus small teams were tasked to manage quality control. Beyond these operational issues, a project of this size and scope required an organizational model designed to maximize cooperation and academic creativity and minimize internal competition and conflict. We thus instituted an inclusive, collective co-authorship agreement, as well as the formation of an internal board to help delineate data analysis plans in a manner that could ensure the quality of outputs while maintaining the individual freedom researchers need to conduct their best work.

There are inevitable limitations to this research approach. It was hard to forecast the feasibility of the project because the pandemic context created unpredictable research conditions and resources. For example, the need to move quickly may have put some pressure on the collaborators to design the study more quickly than is typical. The collaborators

also needed to rely on existing professional networks and institutional resources, which can lead to underrepresentation in both the collaboration and the samples. In addition, our *ad hoc* organizational model may have been effective in the short-term, but it may not be a sustainable model over the long-term.

While longitudinal data collection is ongoing, internal and external collaborators have proceeded with certain planned analyses, which presently span three general themes:

Psychological vulnerability and resilience. One research theme focuses on the impact of the pandemic on behavioral and psychological functioning. Some investigations have considered group-based disparities in these outcomes. For example, one investigation examines intergenerational differences in psychological responses to the pandemic and its effects on people's plans, daily routines, and mental states. Preliminary results indicate that older respondents, despite potentially facing a more serious health threat from the virus, were less likely to perceive the pandemic as interfering with their life plans (Jin et al., under review). Younger respondents showed stronger emotional reactivity. Such disparities in vulnerability may produce cohort differences in behavior and health outcomes.

Social psychological processes. The pandemic may require people to choose between protecting their health and maintaining other important contributors to quality of life, such as financial security, high-quality interpersonal relationships, and personal autonomy. Several research questions focus on how people resolve this dilemma. One research team is examining the role of personal values in guiding the decisions people make. Preliminary results indicate that those who tend to value agency (i.e., values related to competition in social hierarchies, such as ambition and competence) place a greater value on their personal autonomy, whereas those who value communion (i.e., values related to maintaining harmonious relationships and care for others' welfare) are more likely to engage in virus mitigation behaviors that protect other people. In addition, they are more likely to help others suffering from the pandemic (Lemay et al., under review). Other investigations examining social psychological processes examine the role of threat perceptions, trust in the government and affective states in guiding this prosocial behavior.

Virus mitigation behavior. Another objective of this research was to identify the most important predictors of virus mitigation behavior. We designed the survey to cast a wide net, including variables that are intrapersonal (e.g., affect), interpersonal (e.g., relationships, norms), societal (e.g., employment conditions, government efficacy, living situation), and cultural (e.g., national lockdown policy or virus severity in one's country). Given the numerous potentially relevant predictors, we used both deductive and inductive approaches to analyze the data. That is, in parallel to planned deductive analyses in which we tested various theoretically-driven hypotheses, an independent team conducted data-driven analyses. Such inductive analyses can help advance our understanding of virus mitigation phenomena in ways that may not have been anticipated by extant theories. Moreover, this research has the potential to identify the most important predictors of virus mitigation at multiple levels of analysis, and may identify targets for intervention at each of those levels.

In sum, PsyCorona may serve as an exemplar of a large-scale, collaborative, and rapid approach to behavioral science research that emerges bottom-up and is equipped to study global challenges as they occur. If psychological science is to understand human behavior within context, then we must be able to collect data while that context is unfolding. It is our hope that PsyCorona provides theoretical and practical insights regarding the impact of disease and disasters on social and behavioral development, while also serving as a test case for how independent scientists can rally to conduct research into pressing social problems.

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