

PSYCHOLOGICAL DISTRESS AND THE COVID-19 PANDEMIC: THE IMPORTANT ROLE OF UNCERTAINTY*

ANGUSTIA PSICOLÓGICA Y LA PANDEMIA DEL COVID-19: EL PAPEL IMPORTANTE DE LA INCERTIDUMBRE

Recibido: 24 de septiembre de 2021 | Aceptado: 3 de diciembre de 2021

Naomi Koerner¹, Jennifer Morales-Cruz²

¹Department of Psychology, Ryerson University, Toronto, Canada

²School of Behavioral and Brain Sciences, Ponce Health Sciences University, Ponce, Puerto Rico

ABSTRACT

The unprecedented uncertainty associated with the COVID-19 pandemic has been widely acknowledged. However, uncertainty and the complex psychological responses that it generates have not often been the core or *centerpiece* of writings on pandemic distress. In this paper, we discuss why it is crucial to understand pandemic distress reactions as a psychological response to *uncertainty*, in and of itself. To inform this discussion, we have drawn on writings and research on the topic of uncertainty within psychology and other disciplines (e.g., public health). We attempt to apply some of these ideas to the Puerto Rican context, where the COVID-19 pandemic has been one among many "uncertainty disasters." The importance of *autogestión* in Puerto Rico is discussed.

KEYWORDS: COVID-19 pandemic, distress, Puerto Rico, uncertainty.

RESUMEN

La incertidumbre sin precedentes asociada con la pandemia del COVID-19 ha sido ampliamente reconocida. Sin embargo, la incertidumbre y las complejas respuestas psicológicas que genera no han sido a menudo el núcleo o la pieza central de los escritos sobre la angustia pandémica. En este artículo, discutimos por qué es crucial comprender las reacciones de la angustia pandémica como una respuesta psicológica a la incertidumbre, en sí misma. Para informar esta discusión, nos hemos basado en escritos e investigaciones sobre el tema de la incertidumbre dentro de la psicología y otras disciplinas (por ejemplo, salud pública). Intentamos aplicar algunas de estas ideas al contexto puertorriqueño, donde la pandemia del COVID-19 ha sido uno entre muchos "desastres de incertidumbre". Abordamos la importancia de la autogestión en Puerto Rico.

PALABRAS CLAVE: Angustia, incertidumbre, pandemia del COVID-19, Puerto Rico.

* Both authors contributed equally to this work. Correspondence concerning this article should be addressed to:

1. Naomi Koerner, PhD, Department of Psychology, Ryerson University, 350 Victoria Street, Toronto, Ontario, Canada, M5B 2K3.

Email: naomi.koerner@ryerson.ca

2. Jennifer Morales-Cruz, PhD, School of Behavioral and Brain Sciences, Ponce Health Sciences University, 388 Zona Industrial Reparada 2, Ponce PR 00716.

Email: jmorales@psm.edu

Although uncertainty is widely acknowledged to have played a role in COVID-19 pandemic-related distress and anxiety (e.g., Koffman, 2020), there is a risk that this assertion will be reduced to a generic ‘truism’ if not made the focus of direct analysis. In this article, we present a few ideas regarding the centrality of *uncertainty* to pandemic-related distress and anxiety (Freeston et al., 2020), and discuss possible applications to the Puerto Rican context, where historically, uncertainty has been an expansive, lived experience.

Early in the pandemic, projections regarding a coinciding and longer-term “mental health pandemic” (Sanderson et al., 2020) ensued. However, concerned about the potential for misdiagnosing or overdiagnosing normative distress as mental disorder in the context of uncertainty posed by the COVID-19 pandemic, Durodié (2020) cautioned, “to project the public or a significant proportion of it, as unable to cope, could be a self-fulfilling error.”

There is abundant evidence from psychology, medicine, economics, and many other disciplines that most people experience uncertainty as very aversive and anxiety-provoking (Freeston et al., 2020; Koerner et al., 2017), especially when conditions are threatening, novel, and unfamiliar (Brosschot et al., 2018). For most of us, the global pandemic epitomizes such conditions. Critically, the *default* response to this kind of uncertainty is the alertness that characterizes the stress response, terminated only once safety is perceived. However, if there continues to be uncertainty *about* safety, the default response will remain active (Brosschot et al., 2018). Environmental factors that contribute to or amplify a sense of unsafety include lack of adequate shelter, distortions in information, and social contexts characterized by unexpected and rapid changes in rules (Brosschot et al., 2018).

Considered through this lens, pandemic-related distress and anxiety are not immediate signifiers of “poor coping” or a psychopathological response. Rather, many of these

reactions, even those that are intense or prolonged, may reflect a default response to the broad context of uncertainty and “unsafety” posed by the COVID-19 virus and its knock-on effects, compounded by fluctuating behavioral recommendations, inconsistent messaging, and an overwhelming information landscape that has made locating the signal in the noise very difficult (Kesner & Horáček, 2020). Shelter, typically considered an essential source of safety (Brosschot et al., 2018) became precarious and even dangerous during the pandemic – many people faced the threat of housing eviction and displacement, and the increase in domestic violence and femicides during lockdowns and shelter-in-place orders is well-documented (Benfer et al., 2021; Kofman & Garfin, 2020).

Many researchers are attempting to understand pandemic distress and anxiety through the lens of individual difference characteristics such as intolerance of uncertainty, intolerance of ambiguity, and dispositional risk aversion, to name a few (del Valle et al., 2020; Millroth & Frey, 2021; Petrocchi, 2021). However, studying psychological responses as a function of “individuals’ psychological profiles” (Durodié, 2020) may be limiting as uncertainty is also a “lived and spatiotemporal condition” (Senanayake & King, 2020). Thus, psychological experiences of uncertainty need to be contextualized within the sociohistorical, cultural, physical, and temporal contexts in which the uncertainty is being experienced (Biraglia & Brizi, 2021).

For Puerto Ricans, high uncertainty is both an exogenous *and* an expansive lived experience. Anxiety disorders are the most diagnosed mental health disorders (Canino et al., 2016/2019) and it may be that many manifestations of clinically-significant anxiety reflect the default stress response to prolonged conditions of uncertainty and unsafety. “Parallel pandemics” (García et al., 2020) have been declared, resulting from the commonwealth’s unique profile of multiple, enduring uncertainty disasters, with COVID-19 being the most recent in a long sequence. Accordingly, it is difficult to see how attempts

to study, conceptualize, or address pandemic responses using frameworks based largely in individual difference characteristics (e.g., attitudes, temperament, personality traits, skills) can capture the entirety of the psychological experience of uncertainty and pandemic-related distress in Puerto Rico. It seems clear that traditional psychotherapy-oriented approaches are not the immediate solution to managing the excess uncertainty that has characterized the pandemic. Community-driven and system-level interventions are also needed. In Puerto Rico, community-level approaches have in fact been essential in response to many waves of disaster and accompanying uncertainty (Serrano-García, 2020).

Puerto Rico has experienced a long history of political uncertainty and corresponding unsafety (Comas-Díaz et al., 1998). Since 1898, Puerto Rico has been a colony of the United States. Puerto Rico is a commonwealth with autonomy over local affairs, but the United States government manages the insular issues. Some authors call this an “unresolved colonial status;” it survives, in a state of ambiguity and uncertainty, without the powers or resources to determine its own path (Bonilla & LeBrón, 2019; Duany, 2003). The phasing out of Section 936 in 1996, a recession in 2006, a historic bankruptcy, and the imposition of the Puerto Rico Oversight, Management, and Economic Stability Act (Ley PROMESA) have contributed to profound and sustained socioeconomic uncertainty and unsafety. The socioeconomic crisis becomes sharpened when considering the position of Puerto Rico as a subordinate country to the economic, political, and military matters of the United States. The exodus of nearly 500,000 residents in the last decade alone further exposes the unequal subordinated colonial relationship (Balmaceda, 2020; GAO, 2018; Perreira, 2017).

Compromised socioeconomic status contributes to a generalized feeling of uncertainty and unsafety (Brosschot et al., 2018). Over the last thirty years, Puerto Rico has faced high rates of poverty. About 20% of

the population in Puerto Rico is over 60 years of age, and the majority of older adults live in poverty (Garriga, 2020; U.S. Census Bureau, 2020). More than half of children and adolescents (58%) live in poverty in a household with an unemployed caregiver (50%) (Instituto Desarrollo de la Juventud, 2020). Puerto Rico has the highest child poverty rate compared to any U.S. state (U.S. Census Bureau, 2020). Currently, Puerto Ricans are facing fiscal austerity, job losses and insular cuts of public service budgets (e.g., pensions, social and health services) (Pérez-Pedrogo et al., 2020; Perreira, 2017). In addition, residents of Puerto Rico have unequal federal fund parity access (e.g., Supplemental Nutrition Assistance Program (SNAP), Medicaid, and Supplemental Security Income), resulting in barriers to access to the kinds of services that are essential to safety (Balmaceda, 2020). The neoliberal austerity measures have led to detrimental consequences in quality of life and have deepened social and health disparities (Akhter et al., 2018). The First Human Development Report of Puerto Rico (reflecting pre-hurricane data) showed that with respect to disparities, Puerto Rico was fifth in the world (Díaz, 2018; Rodríguez-Velázquez, 2018).

Shelter, an essential source of safety, is under constant uncertain threat in Puerto Rico due to the archipelago’s vulnerability to environmental events such as hurricanes and earthquakes. Estimates indicate that Hurricane María caused damage to more than 300,000 homes (Ma & Smith, 2020). The widespread displacement within and migration away from Puerto Rico following María especially in areas where infrastructure damage was highest, is well-documented (Acosta et al., 2020). This displacement and out-migration, in turn, has had destabilizing effects on communities (Macias et al., 2020) and other important sources of safety – notably, many medical providers left the island following María, leading to a shortage of trained health professionals (Toledo-Hernández, 2018). Adding fuel to the fire of uncertainty and unsafety, an earthquake swarm that included a 6.4 magnitude

earthquake hit Puerto Rico in January 2020, affecting South and Southwest municipalities. Over 7,500 people lost their homes, and many families took shelter in tents, cars, and government refuges in the months that followed (Sánchez, 2020).

Puerto Ricans have also had to contend with multiple public health emergencies that have been characterized by long-term, highly-threatening forms of uncertainty and unsafety. An historical overview of the more than 40 years pre-dating the COVID-19 pandemic shows that the Caribbean Islands faced Dengue, HIV, Chikungunya, and Zika. In Puerto Rico, approximately 10,888 deaths have been attributed to influenza and another 30,000 mortalities to HIV (Rivera Clemente, 2019). In recent years, much has been written about the uncertainties and unknowns characterizing the Zika virus epidemic in Puerto Rico (2016-2017). Mosquito transmission made it difficult for people, and pregnant women in particular, to definitively protect themselves (Linde et al., 2018). The probability of adverse, serious health outcomes (e.g., microcephaly; Guillain-Barré syndrome) developing was also uncertain and needed to be quantified and modelled (Ellington et al., 2016; Mier-y-Teran-Romero et al., 2018). There was also considerable uncertainty and mixed messaging as to whether the Zika epidemic had actually ended or not in Puerto Rico (Rodríguez-Díaz et al., 2017).

Fear and uncertainty regarding the collapse of the healthcare system remains latent following the myriad disasters and epidemics of recent years (Rios et al., 2020). Puerto Rico has only 63 public and private hospitals. Most are located in urban areas like San Juan and are understaffed due to lay-offs (Garriga-López, 2020). Further, there are no emergency departments in eight rural municipalities (Adjuntas, Coamo, Culebra, Jayuya, Las Marías, Maricao, Salinas, and Santa Isabel) (Human Resources and Services Administration, 2020).

Thus, in Puerto Rico, the COVID-19 pandemic arrived in the wake of years of

enduring, *cumulative* uncertain threat, unsafety, and economic and health disparities. Between 2017 and 2020 *alone*, residents were responding to two back-to-back hurricanes and an earthquake swarm, without any identifiable reprieve from the unsafety. The effects of these disasters were, and continue to be, compounded by political and economic crises and shocks, fiscal constraints, climate injustice, and colonialism—additional sources of uncertainty and unsafety. Thus, the experience of pandemic-related uncertainty and anxiety in Puerto Rico needs to be conceptualized within this unique socio-political-historical context in which uncertainty and unpredictability are intimately intertwined with the threat of profound loss, and death.

The psychology literature has shown that being made to wait for an uncertain outcome (e.g., a medical test result or the outcome of a qualifying exam) is harder to tolerate than other kinds of stressors (Sweeny, 2018). Waiting is associated with increased negative affect and sleep disturbances, likely mediated by worry and these effects tend to be worst at the start and at the end of the waiting period (Sweeny, 2018). What makes the pandemic distinct as a waiting period, is that it has no defined end point that can be anticipated. This kind of “time suspension” (Bonilla, 2020a) may be novel for many of us and may be harder to tolerate psychologically relative to more ‘ordinary’ waiting periods, characterized by known expected durations or a discrete range of possible outcomes.

Writing about the temporality of the disasters in Puerto Rico, Bonilla (2020a, b) highlighted the “forced act of waiting” that has characterized life in the immediate and longer-term aftermath of María. Bonilla and LeBrón (2019) further alluded to the amorphous quality of the timeframe of disaster in Puerto Rico in stating: “It is difficult to predict when the disaster associated with Hurricane María will actually end...Nor is it even clear when this disaster began (p. 5).” It would be of interest to examine how the psychological experience of time and waiting has impacted the experience of uncertainty during the

pandemic in Puerto Rico. People feel desperate to know when the pandemic will end (Pérez-Pedrogo et al., 2020); however, it remains unclear as to what constitutes “post-pandemic” (or even “pre-pandemic”) for those living in Puerto Rico.

Uncertainty, and the associated unsafety and distress are not merely psychic or perceptual experiences to be self-managed or “treated.” Uncertainty is also sociopolitical. In an “uncertainty disaster” such as the COVID-19 pandemic (Everly et al., 2020), the question arises as to the extent to which individuals should shoulder the responsibility for coping with their own uncertainty distress. Writing specifically about the problems associated with an individualistic lens of uncertainty and its management, Durodié (2020) aptly stated that “[fear] is transmitted by social structures, history, and our relations to others.” (p. S62). Early in the pandemic, the World Health Organization drafted a document for health authorities and decision-makers out-lining several recommendations for responsible communication of uncertainty to the public.¹ Therefore, organizations and institutions have a critical role to play in the public’s experience of uncertainty. During times of crisis, uncertainty is sometimes politicized and exploited (e.g., to justify inaction) (Kreps & Kriner, 2020). Thus, responsible management of uncertainty is also an ethical imperative. Having said that, there remains much to be learned about how to communicate uncertainty in a way that does not erode public trust (Han et al., 2018), as communication missteps can have enduring and devastating effects (Clark-Ginsberg & Sayers, 2020). How to effectively communicate uncertainty will need to be a focus of continued empirical attention, ideally involving interdisciplinary collaboration (e.g., between psychologists, public health scientists and ethicists).

In Puerto Rico, inconsistent and discrepant communication about the death toll following Hurricane María increased skepticism and

provoked distrust in the local government (Andrade et al., 2020). In December 2017, the Puerto Rican government estimated that there had been 64 deaths from María. However, a few months later, a study by public health scientists estimated the true number of fatalities between September 20 and December 31, 2017, at (a minimum of) 4,645 once accounting for indirect causes such as lack of water and electricity, unsanitary conditions, complications due to chronic illness, and the inaccessibility of medical services due to hospital floods and closures (Kishore et al., 2018). Although the then-governor resigned following massive protests in 2019, distrust in the governmental handling of emergencies endured. The public’s experiences of involuntary, imposed uncertainty about the death toll following María and the “forced act of waiting” that has characterized the hurricane’s aftermath have likely had a spillover impact on pandemic-related uncertainty and beliefs about the government’s ability to competently respond. In a study of Puerto Ricans who reported being uncertain about getting vaccinated or sure that they would not pursue vaccination against COVID-19, about 1/3 cited lack of trust in the government as a reason (López-Cepero et al., 2021).

Throughout the pandemic, “resilience” has appeared alongside “uncertainty” in various discourses on coping. For example, much has been written about how cognitive behavioral therapy can help individuals build their own personal resilience to pandemic-related adversity and uncertainty (e.g., Naeem et al., 2020; Sanderson et al., 2020). However, conceptualizing resilience as an individual difference characteristic, a mindset or a skillset (McCleskey & Gruda, 2020; Paredes et al., 2021) can carry risks depending on the context - like uncertainty, resilience can be exploited e.g., when institutions deflect responsibility onto *individuals* for their own resilience in the face of uncertainty and disaster (Borges-Méndez & Caron, 2019; Ortiz Torres, 2020; Serrano-García, 2020). An individualistic lens on uncertainty and its

¹ https://www.who.int/docs/default-source/searo/whe/coronavirus19/managing-uncertainty-in-covid-19-a-quick-guide.pdf?sfvrsn=270e4ac8_4

management ignores the “politics of resilience” and the important role of social conditions (Borges-Méndez & Caron, 2019; Dagdeviren et al., 2015).

Following María, residents and communities in Puerto Rico were left to their own devices to take action and reduce their own sense of unsafety and uncertainty and mobilize their own resources (Bonilla, 2020a). Puerto Ricans organized aid to families impacted by the disasters. Most of the aid relief was managed by the communities themselves and local non-profit entities. Initiatives emerged to meet the basic needs of food, building materials, beds, and physical and mental health services to communities. The people organized themselves, and help was reaching the places that needed it. Public and private universities mobilized health and mental health professionals as well as students of medicine, public health, nursing, and psychology to bring services to the people (Trifilio-Martínez et al., 2020). The Puerto Rican Psychological Association was also present with the volunteers, the Red Cross collaboration, and the Mental Health Response Network for Emergencies and Disasters.

In response to the earthquake sequence that struck in early 2020, affected communities once again mobilized their own resources to help those whose homes had collapsed, or were at risk of collapsing (Rodríguez Soto, 2020). Communities also developed their own emergency preparedness protocols and training in anticipation of aftershocks (Rodríguez Soto, 2020). The experience of earthquakes is quite different compared to waiting to track a storm or a hurricane. The potential for aftershocks of unknown duration makes earthquakes unpredictable and particularly anxiety-provoking.

When the COVID-19 pandemic was declared, communities provided various types of outreach to residents. For example, in Arenas, to combat misinformation, community members created educational public service

announcements about COVID-19 that were transmitted through loudspeaker. Community leaders also developed their own contact tracing systems and engaged in active monitoring of symptoms via telephone calls to each household (Rodríguez Soto, 2020). In October 2021, Puerto Rico became the jurisdiction in the United States with the highest vaccination rate (Acevedo, 2021). As of November 28, 2021, 82.4% of those eligible have received the vaccine series, and 91% have received at least 1 dose (Department of Health, 2021). These data reflect the extensive health promotion measures taken by citizens to curb community transmission and reduce their own unsafety and excess uncertainty. It is significant to recognize the education campaigns launched by Puerto Rican health professionals and scientists; the massive vaccination events of the multisectoral *Coalición de Inmunización y Promoción de la Salud (VOCES)*, the 330 Health Centers, and the community pharmacies.

It is evident that local and diaspora initiatives and efforts have been vital in the face of uncertainty and poor governmental response to emergencies. While many refer to such action as “resilience,” in Puerto Rico, *autogestión* most accurately captures this response. In English, the blunt translation of *autogestión* is “self-management.” *Autogestión* is radically different from the concepts that self-management may connote—it is not, for example, self-help, self-regulation, or self-control. Rather, *autogestión* is “self-determination” (Ortiz Torres, 2020). Importantly, this does not refer to an internal characteristic per se. As Ortiz Torres (2020) explains, it “promote[s] the empowerment/strengthening of citizens and communities to demand what they deserve, when they need it.” (p. 363). Grounded in community psychology approaches, *autogestión* is proposed to influence collective and individual mental health and well-being through mutual aid and autonomous organizing (García López, 2020; Ortiz Torres, 2020).

Summary

While the “unprecedented uncertainty” (Koffman et al., 2020) associated with the COVID-19 pandemic has been widely acknowledged, this uncertainty has more often been discussed as a corollary of COVID-19 and the many threats (actual and potential) the virus and the pandemic have posed. However, uncertainty and the complex psychological responses that it generates, has not often been the core or *centerpiece* of writings on COVID-19 pandemic distress.

In this paper, we suggest that it is crucial to understand pandemic-related distress reactions as a psychological response to *uncertainty*, in and of itself (Freeston et al., 2020) and as a default response to uncertainty and corresponding unsafety (see Brosschot et al., 2018). Moreover, uncertainty needs to be understood as a construct that is simultaneously psychic, spatial-temporal, and sociopolitical. Attempts to study pandemic-related uncertainty and distress at the level of individual differences or clinical characteristics (e.g., dispositional characteristics like intolerance of uncertainty or neuroticism) are unlikely to bring about the advances needed for individuals and communities to respond effectively to future “uncertainty disasters.” The complexity and potential pitfalls of discourses centered on “building resilience” and “tolerating uncertainty” become apparent when considering Puerto Rico, where the COVID-19 pandemic arrived in the wake of years of political, economic, social and physical uncertainty and unsafety. Addressing cumulative, collective uncertainty and unsafety in Puerto Rico has required interventions that transcend conventional individualistic or “clinical” models.

Research Ethical Standards

Funding: This work was not funded by any agency.

Declaration of Conflicting Interests: The authors declared no potential conflicts of

interest with respect to the research, authorship, and/or publication of this article.

Approval from the Institutional Review Board for Human Research: Does not apply.

Informed Consent/Assent: Does not apply.

REFERENCES

- Acevedo, N. (2021). Puerto Rico leads nation in Covid-19 vaccinations. NBC News. <https://www.nbcnews.com/news/latino/puerto-rico-leads-nation-covid-19-vaccinations-white-house-says-rcna3339>
- Acosta, R. J., Kishore, N., Irizarry, R. A., & Buckee, C. O. (2020). Quantifying the dynamics of migration after Hurricane Maria in Puerto Rico. *Proceedings of the National Academy of Sciences of the United States of America*, 117(51), 32772-32778. <https://doi.org/10.1073/pnas.2001671117>
- Akhter, N., Bambra, C., Mattheys, K., Warren, J., & Kasim, A. (2018). Inequalities in mental health and well-being in a time of austerity: Follow-up findings from the Stockton-on-Tees cohort study. *SSM Population Health*, 6, 75-84. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6138882/>
- Andrade, E. L., Barrett, N. D., Edberg, M.C., Rivera, M.I., Latinovic, L., Seeger, M.W., Goldman-Hawes, A., & Santos-Burgoa, C. (2020). Mortality reporting and rumor generation: An assessment of crisis and emergency risk communication following Hurricane Maria in Puerto Rico. *Journal of International Crisis and Risk Communication Research*, 3(1), 15-48. <https://doi.org/10.30658/jicrcr.3.1.2>
- Balmaceda, J. (2020). *Long in Recession, Puerto Rico Needs More than Just COVID-19 Relief to Overcome its Crises*. Center on Budget and Policy Priorities. <https://www.cbpp.org/sites/default/files/atoms/files/5-7-20econ.pdf>

- Benfer, E. A., Vlahov, D., Long, M. Y., Walker-Wells, E., Pottenger Jr., J. L., Gonsalves, G., & Keene, D. E. (2021). Eviction, health inequity, and the spread of COVID-19: Housing policy as a primary pandemic mitigation strategy. *Journal of Urban Health, 98*(1), 1-12.
<https://doi.org/10.1007/s11524-020-00502-1>
- Bonilla, Y. (2020a). The coloniality of disaster: Race, empire, and the temporal logics of emergency in Puerto Rico, USA. *Political Geography, 78*, 1-12.
<https://doi.org/10.1016/j.polgeo.2020.102181>
- Bonilla, Y. (2020b). The swarm of disaster. *Political Geography, 78*, 1-3.
<https://doi.org/10.1016/j.polgeo.2020.102182>
- Bonilla, Y., & LeBrón, M. (2019). *Aftershocks of disaster: Puerto Rico before and after the storm*. Haymarket Books.
- Borges-Méndez, R., & Caron, C. (2019). Decolonizing resilience: The case of reconstructing the coffee region of Puerto Rico after hurricanes Irma and Maria. *Journal of Extreme Events, 6*(1), 1-19.
<https://doi.org/10.1142/S2345737619400013>
- Biraglia, A., & Brizi, A. (2021). "Do I have enough food?" How need for cognitive closure and gender impact stockpiling and food waste during the COVID-19 pandemic: A cross-national study in India and the United States of America. *Personality and Individual Differences, 168*, 1-6.
<https://doi.org/10.1016/j.paid.2020.110396>
- Brosschot, J.F., Verkeuil, B., & Thayer, J.F. (2018). Generalized unsafety theory of stress: Unsafe environments and conditions, and the default stress response. *International Journal of Environmental Research and Public Health, 15*(3), 2-27.
<https://doi.org/10.3390/ijerph15030464>
- Clark-Ginsberg, A., & Sayers, E. L. (2020). Communication missteps during COVID-19 hurt those already most at risk. *Journal of Contingencies and Crisis Management, 28*(4), 482 – 484.
<https://doi.org/10.1111/1468-5973.12304>
- Comas-Díaz, L., Lykes, B., & Alarcón, R.D. (1998). Ethnic conflict and the psychology of liberation in Guatemala, Peru, and Puerto Rico. *American Psychologist, 53*, 778 - 792.
<https://doi.org/10.1037/0003-066X.53.7.778>
- Dagdeviren, H., Donoghue, M., & Promberger, M. (2015). Resilience, hardship and social conditions. *Journal of Social Policy, 45*(1), 1 - 20.
<https://doi.org/10.1017/S004727941500032X>
- del Valle, M.V., Andres, M.L., Urquijo, S., Yerro-Avincetto, M., Lopez-Morales, H., & Canet-Juric, L. (2020). Intolerance of uncertainty over COVID-19 pandemic and its effects on anxiety and depressive symptoms. *Revista Interamericana de Psicología/Interamerican Journal of Psychology, 54*(2), 1-17.
<https://doi.org/10.30849/ripij.v54i2.1335>
- Department of Health. (2021). *COVID-19 en cifras en Puerto Rico*. Government of Puerto Rico.
<https://covid19datos.salud.gov.pr>
- Díaz, M. (13 de mayo de 2018). *Expuesta la desigualdad social*. El Nuevo Día.
<https://www.elnuevodia.com/noticias/locales/notas/expuesta-la-desigualdad-social/>
- Duany, J. (2003). Nation, migration, identity: The case of Puerto Ricans. *Latino Studies, 1*(3), 424-444.
<https://doi.org/10.1057/palgrave.lst.8600026>
- Durodié, B. (2020). Handling uncertainty and ambiguity in the COVID-19 pandemic. *Psychological Trauma. Theory, Research, Practice, and Policy, 12*(S1), S61-S62.
<https://doi.org/10.1037/tra0000713>
- Ellington, S. R., Devine, O., Bertolli, J., Martinez Quiñones, A., Shapiro-

- Mendoza, C. K., Perez-Padilla, J., Rivera-Garcia, B., Simeone, R. M., Jamieson, D. J., Valencia-Prado, M., Gilboa, S. M., Honein, M. A., & Johansson, M. A. (2016). Estimating the number of pregnant women infected with Zika virus and expected infants with microcephaly following the Zika virus outbreak in Puerto Rico, 2016. *JAMA Pediatrics*, *170*(10), 940 – 945. <https://doi.org/10.1001/jamapediatrics.2016.2974>
- Everly, G. S., Wu, A. W., Cumpsty-Fowler, C. J., Dang, D., & Potash, J. B. (2020). Leadership principles to decrease psychological casualties in COVID-19 pandemic and other disasters of uncertainty. *Disaster Medicine and Public Health Preparedness*, 1-3. Advance online publication. <https://doi.org/10.1017/dmp.2020.395>
- Freeston, M., Tiplady, A., Mawn, L., Bottesi, G., & Thwaites, S. (2020). Towards a model of uncertainty distress in the context of COVID-19. *The Cognitive Behaviour Therapist*, *13*, 1-15. <https://doi.org/10.1017/S1754470X2000029X>
- GAO. (2018). GAO highlights. Factors contributing to the debt crisis and potential federal actions to address them. <https://www.gao.gov/assets/700/691675.pdf>
- García, C., Rivera, F. I., García, M. A., Burgos, G., & Aranda, M. P. (2020). Contextualizing the COVID-19 era in Puerto Rico: Compounding disasters and parallel pandemics. *The Journals of Gerontology: Series B*, *76*(7), e263–e267. <https://doi.org/10.1093/geronb/gbaa186>
- García López, G.A. (2020). Reflections on disaster colonialism: Response to Yarimar Bonilla's 'The wait of disaster.' *Political Geography*, *78*, 1-4. <https://doi.org/10.1016/j.polgeo.2020.102170>
- Garriga-López, A. M. (2020). Compounded disasters: Puerto Rico confronts COVID-19 under US colonialism. *Social Anthropology*, *28*(2), 269-270. <https://doi.org/10.1111/1469-8676.12821>
- Han, P. K. J., Zikmund-Fisher, B. J., Duarte, C. W., Knaus, M., Black, A., Scherer, A. M., & Fagerlin, A. (2018). Communication of scientific uncertainty about a novel pandemic health threat: Ambiguity aversion and its mechanisms. *Journal of Health Communication*, *23*(5), 435 - 444. <https://doi.org/10.1080/10810730.2018.1461961>
- Instituto del Desarrollo de la Juventud. (2020). *Índice de bienestar social*.
- Kesner, L., & Horáček, J. (2020). Three challenges that the COVID-19 pandemic represents for psychiatry. *British Journal of Psychiatry*, *217*(3), 475 - 476. <https://doi.org/10.1192/bjp.2020.106>
- Kishore, N., Marqu.s, D., Mahmud, A., Kiang, M. V., Rodriguez, I., Fuller, A., Ebner, P., Sorensen, C., Racy, F., Lemery, J., Maas, L., Leaning, J., Irizarry, R. A., Balsari, S., & Buckee, C. O. (2018). Mortality in Puerto Rico after Hurricane Maria. *The New England Journal of Medicine*, *379*(2), 162-170. <https://doi.org/10.1056/NEJMsa1803972>
- Koerner, N., Mejia, T., & Kusec, A. (2017). What's in a name? Intolerance of uncertainty, other uncertainty-relevant constructs, and their differential relations to worry and generalized anxiety disorder. *Cognitive Behaviour Therapy*, *46*(2), 141 – 161. <https://doi.org/10.1080/16506073.2016.1211172>
- Kofman, Y., & Garfin, D. R. (2020). Home is not always a haven: The domestic violence crisis amid the COVID-19 pandemic. *Psychological Trauma*, *12*(1), S199 -S201. <https://doi.org/10.1037/tra0000866>
- Koffman, J. (2020). Uncertainty and COVID-19: How are we to respond? *Journal of the Royal Society of Medicine*, *113*, 211 – 216. <https://doi.org/10.1177/0141076820930665>

- Kreps, S. E., & Kriner, D. L. (2020). Model uncertainty, political contestation, and public trust in science: Evidence from the COVID-19 pandemic. *Sciences Advances*, 6(43), 1-12. <https://doi.org/10.1126/sciadv.abd4563>
- Linde, A.R., & Siqueira, C.E. (2018). A vida das mulheres na era do Zika: vidas controladas por mosquitos? *Cadernos de Saúde Pública*, 34(5), e00178917. <https://doi.org/10.1590/0102-311X00178917>
- López-Cepero, A., Cameron, S., Negrón, L. E., Colón López, V., Colón-Ramos, U., Mattei, J., Fernández-Repollet, E. & Pérez, C. M. (2021). Uncertainty and unwillingness to receive a COVID-19 vaccine in adults residing in Puerto Rico: Assessment of perceptions, attitudes, and behaviors. *Human Vaccines & Immunotherapeutics*, 17(10), 3441–3449. <https://doi.org/10.1080/21645515.2021.1938921>
- Ma, C., & Smith, T. (2020). Vulnerability of renters and low-income households to storm damage: Evidence from Hurricane Maria in Puerto Rico. *American Journal of Public Health*, 110(2), 196-202. <https://doi.org/10.2105/AJPH.2019.305438>
- Macias, R. L., LeBrón, A., Taylor, K., & Silva, M. (2019). Después de la tormenta: Collective trauma following Hurricane Maria in a northeastern Puerto Rican community in the United States. *Journal of Community Psychology*, 49(1), 118-132. <https://doi.org/10.1002/jcop.22442>
- McCleskey, K., & Gruda, D. (2020). Risk-taking, resilience, and state anxiety during the COVID-19 pandemic: A coming of (old) age story. *Personality and Individual Differences*, 170, 1-6. <https://doi.org/10.1016/j.paid.2020.110485>
- Mier-y-Teran-Romero, L., Delorey, M. J., Sejvar, J. J., & Johansson, M. A. (2018). Guillain-Barré syndrome risk among individuals infected with Zika virus: A multi-country assessment. *BMC Medicine*, 16, 67. <https://doi.org/10.1186/s12916-018-1052-4>
- Millroth, P., & Frey, R. (2021). Fear and anxiety in the face of COVID-19: Negative dispositions towards risk and uncertainty as vulnerability factors. *Journal of Anxiety Disorders*, 83, 1-8. <https://doi.org/10.1016/j.janxdis.2021.102454>
- Naem, F., Irfan, M., & Javed, A. (2020). Coping with COVID-19: Urgent need for building resilience through cognitive behaviour therapy. *Khyber Medical University Journal*, 12(1), 1-3. <https://doi.org/10.35845/kmuj.2020.20194>
- Ortiz Torres, B. (2020). Decoloniality and community-psychology practice in Puerto Rico: Autonomous organising (autogestión) and self-determination. *International Review of Psychiatry*, 32(4), 359 - 364. <https://doi.org/10.1080/09540261.2020.1761776>
- Paredes, M. R., Apaolaza, V., Fernandez-Robin, C., Hartmann, P., & Yañez-Martinez, D. (2021). The impact of the COVID-19 pandemic on subjective mental well-being: The interplay of perceived threat, future anxiety and resilience. *Personality and Individual Differences*, 170, 1-6. <https://doi.org/10.1016/j.paid.2020.110455>
- Pérez-Pedrogo, C., Francia-Martínez, M., & Martínez-Taboas, A. (2020). COVID-19 in Puerto Rico: Preliminary observations on social distancing and societal response toward a novel health stressor. *Psychological Trauma: Theory, Research, Practice, and Policy*, 12(5), 515–517. <https://doi.org/10.1037/tra0000664>
- Perreira, K. (2017). Environmental scan of Puerto Rico's health care infrastructure. Urban Institute. <https://www.urban.org/sites/default/files/publication/87016/2001051->

- environmental-scan-of-puerto-ricos-health-care-infrastructure_1.pdf
- Petrocchi, S., Iannello, P., Ongaro, G., Antonietti, A., & Pravettoni, G. (2021). The interplay between risk and protective factors during the initial height of the COVID-19 crisis in Italy: The role of risk aversion and intolerance of ambiguity on distress. *Current Psychology*. Advance online publication, 1-12. <https://doi.org/10.1007/s12144-021-01601-1>
- Rios, C. C., Ling, E.J., Rivera-Gutierrez, R., Gonzalez Sanchez, J., Bruce, J., Barry, M., & de Jesus Perez, V. (2020). Puerto Rico health system resilience after Hurricane Maria: Implications for disaster preparedness in the COVID-19 era. *MedRxiv*. <https://doi.org/10.1101/2020.09.20.20198531>
- Rodríguez-Díaz, C. E., Garriga-López, A., Malavé-Rivera, S. M., & Vargas-Molina, R. L. (2017). Zika virus epidemic in Puerto Rico: Health justice too long delayed. *International Journal of Infectious Diseases*, 65, 144 – 147. <https://doi.org/10.1016/j.ijid.2017.07.017>
- Rodríguez Soto, I. (2020) Mutual aid and survival as resistance in Puerto Rico. *NACLA Report on the Americas*, 52(3), 303-308. <https://doi.org/10.1080/10714839.2020.1809099>
- Rodríguez-Velázquez, V. (15 de mayo de 2018). Desigualdad social empeorará estancamiento económico de Puerto Rico. *Diálogo UPR*. <https://dialogo.upr.edu/desigualdad-social-empeorara-estancamiento-economico-de-puerto-rico/>
- Sánchez, R. (2020). *El trauma para las familias afectadas por el terremoto de Puerto Rico continúa a miles de kilómetros de casa*. Cable News Network. <https://cnnespanol.cnn.com/2020/01/29/el-trauma-para-las-familias-afectadas-por-el-terremoto-de-puerto-rico-continua-a-miles-de-kilometros-de-casa/#0>
- Sanderson, W.C., Arunagiri, V., Funk, A. P., Ginsburg, K.L., Krychiw, J. K., Limowki, A. R., Olesnycky, O.S., & Stout, Z. (2020). The nature and treatment of pandemic-related psychological distress. *Journal of Contemporary Psychotherapy*, 50(4) 251 – 263. <https://doi.org/10.1007/s10879-020-09463-7>
- Senanayake, N., & King, B. (2020). Geographies of uncertainty. *Geoforum*, 123, 129-135. <https://doi.org/10.1016/j.geoforum.2020.07.016>
- Serrano-García, I. (2020). Resilience, coloniality, and sovereign acts: The role of community activism. *American Journal of Community Psychology*, 65(1-2), 3-12. <https://doi.org/10.1002/ajcp.12415>
- Sweeny, K. (2018). On the experience of awaiting uncertain news. *Current Directions in Psychological Science*, 27(4), 281-285. <http://doi.org/10.1177/0963721417754197>
- Toledo-Hernández, E. (13 de mayo de 2018). *Plan de Ajuste Fiscal y Crisis de Acumulación en Puerto Rico*. *Sociedad Sinergia*.
- Trifilio-Martínez, M. S., Torres-Marrero, E., Pagán-Torres, O. M., & Morales-Cruz, J. (2020). Terremotos y pandemia: Retos universitarios durante el año 2020. *Revista Salud y Conducta Humana*, 7(1), 1-9. <https://static1.squarespace.com/static/50c39c53e4b097533b3492dd/t/5fe3c8a72c56b231e6d09554/1608763562043/Editorial+Volumen+7+N+1+%282020%29.pdf>
- U.S. Census Bureau. (2020). Data USA: Puerto Rico. <https://embed.datausa.io/profile/geo/puerto-rico/>