Chapter 24

Bridging Research and Practice for Impact: Behavioral Science in Action for Effective Risk, Crisis, and Disaster Communication

JungKyu Rhys Lim
Jimena Llopis

Abstract

Public sector organizations worldwide are increasingly employing behavioral science to enhance the risk, crisis, and disaster communication across diverse contexts. These applications encompass areas, such as advancing public health, protecting lives, developing vulnerable communities' learning and skills, promoting financial savings, saving energy and resource, and reducing violence and corruption. Notably, organizations, such as the World Bank, Save the Children, and UNICEF, employ behavioral science to engage with vulnerable populations beyond Western, educated, industrialized, rich, and democratic (WEIRD) societies, in low and middle-income countries, which have been underrepresented in risk, crisis, and disaster communication research. In this chapter, we introduce how behavioral science has been used in risk, crisis, and disaster communication. Specifically, we introduce a general behavioral science approach, exemplified by the Behavioral Insight Team (BIT)'s Target, Explore, Solution, Trial, and Scale (TESTS) approach, alongside complementary models and frameworks, including the Capability, Opportunity, Motivation-Behavior (COM-B) model for diagnostics, and the Easy, Attractive, Social, and Timely (EAST) principles and the MINDSPACE Framework to complement intervention design. Lastly, we present a case study to illustrate how these work in disaster preparedness and response efforts in Haiti.

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Introduction

Increasing number of public organizations at local, state, national, regional, and international levels are using behavioral science approaches and insights in public policy, including risk, crisis, and disaster communication, to solve problems, such as improving health and protecting lives (Afif et al., 2019; Manning et al., 2020; OECD, 2017; Straßheim, 2020). Behavioral public policy influences and shapes human behavior through various and diverse means and modes, employing knowledge and insights from behavioral economics, social and behavioral sciences, psychology, and neurosciences (Straßheim, 2020). Behavioral science is "in its broadest sense, a discipline that uses scientific methods to generate and test theories that explain and predict the behaviors of individuals, groups, and populations," whereas behavioral insights are "the application of findings from behavioral science to analyze and address practical issues in real-world settings, usually coupled with a rigorous evaluation" (Hallsworth, 2023, p. 311). The range of policy instruments encompasses simplification to reduce citizens' cognitive load and burden, education programs about various risks, social norms marketing techniques, and behaviorally informed regulations (Straßheim & Beck, 2019). One widely known behavioral public policy would be a nudge, or "any aspect of the choice architecture that alters people's behavior in a predictable way without forbidding any options or significantly changing their economic incentives," such as rearranging fruits in cafeterias at eye level (Thaler & Sunstein, 2021, p. 8).

In this chapter, we introduce how behavioral science is being used in the realm of risk, crisis, and disaster communication. This chapter consists of four sections. First, we introduce the general behavioral science approach used by behavioral science units and organizations across the world: the Behavioral Insight Team (BIT)'s Target, Explore, Solution, Trial, and Scale (TESTS) approach (Kettle & Persian, 2022). A similar approach has been followed by organizations, such as the World Bank's Mind, Behavior, and Development (eMBeD) unit (World Bank, 2015b, 2022a), the World Health Organization (WHO, 2022), Save the Children (2022) Center of Utilizing Behavioral Insights for Children (CUBIC), United Nations Children's Fund (UNICEF, 2022), and the Inter-American Development Bank (IDB, 2022), among others. In essence, behavioral science units identify and define behavioral problems, use formative research to diagnose decision-making processes with barriers and opportunities, design solutions, test and evaluate the solutions through experiments, and scale solutions up if and when the solutions show a positive impact (Kettle & Persian, 2022). Types of risk, crises, and disasters that these organizations engage include public health risks (e.g., smoking cessation, nutrition, immunization, COVID-19), weather, climate, environmental risks (e.g., hurricanes, wildfires, heatwaves, air quality, open waste burning), gender (e.g., gender-based violence), education and job-related risks (e.g., learning crisis, school dropout, school violence, inter-ethnic cohesion), among many (e.g., IDB, 2022; UNICEF, 2022; World Bank, 2015b, 2022a). Notably, these organizations employ behavioral science to engage with vulnerable populations beyond Western, educated, industrialized, rich, and democratic (WEIRD) societies, in low and middle-income

countries (Henrich et al., 2010), which have been understudied in risk, crisis, and disaster communication research (Diers-Lawson, 2017).

Second, we introduce complementary behavioral science models and frameworks commonly used by behavioral scientists, such as the Capability, Opportunity, Motivation-Behavior (COM-B) model (Michie et al., 2011; West & Michie, 2023), the Easy, Attractive, Social, and Timely (EAST) principles (Service et al., 2014), and MINDSPACE Framework (Dolan et al., 2010, 2012). These models and frameworks provide some guidelines for specific stages in the overall behavioral science approach. For example, the COM-B Model could be used in the explore phase to identify and understand the target behaviors, context, and their actors, enablers, and bottlenecks. Conversely, the EAST principles and the MINDSCAPE framework could provide some ideas and insights in the solution phase to brainstorm and design effective interventions.

Third, we present a case study on disaster preparedness and responses in Haiti (Llopis et al., 2020; World Bank, 2022b). In Haiti, while working with the World Bank's eMBeD unit, we conducted diagnostics to understand barriers to disaster preparedness and response. Then, we developed and implemented a disaster risk communication campaign tailored to the local context. Lastly, we conclude the chapter by highlighting that using behavioral science for risk, crisis, and disaster communication can address the often overlooked social and psychological factors and lead to more impactful interventions.

Primary Approach to Behavioral Science: Target, Explore, Solution, Trial, and Scale (TESTS) Approach

We introduce the general behavioral science approach widely used by behavioral science units and organizations across the world: the BIT's TESTS approach (Kettle & Persian, 2022). See Figure 25.1. The TESTS approach includes target, explore, solution, trial, and scale phases. Various organizations (e.g., World Bank eMBeD unit, the BIT, the WHO, ideas42, Save the Children CUBIC, IADB) all follow a similar approach, although they refer to their approaches with different names and terms.

Figure 25.1. The target, explore, solution, trial, and scale (TESTS) approach

Source: Kettle & Persian (2022)

First, the behavioral problem is identified and defined. Second, formative research is used to diagnose decision-making processes with barriers and opportunities. Third, based on the barriers identified, solutions are designed. Fourth, solutions are tested and evaluated through experiments, ideally randomized controlled trials (RCTs). Fifth, solutions are re-defined, and problems re-diagnosed until the solution is ready for scale-up. This is an iterative process by design. Now, we will explain the TESTS approach's five phases in detail (Kettle & Persian, 2022).

Phase 1. Target

Policy and organizational goals are often broad and lack clarity regarding the specific behaviors they aim to address. Thus, the initial phase involves identifying the behavior that requires attention and establishing a method for its measurement. Specifically, we define the target behavior, assess the impact and feasibility of changing the target behavior, and determine whether these target behaviors have measurable outcome variables and data sources. By the end of this stage, we will have a short list of two or three target behaviors with measurable outcomes.

Phase 2. Explore

Second, we delve into the context surrounding the target behaviors to gain a comprehensive understanding of how target behaviors can be changed. We plan and conduct formative research to identify to what extent and reasons behind people's engagement (or lack of engagement) in target behaviors, and their actors, enablers, and bottlenecks. Such formative research includes desk research, qualitative research, and quantitative research. The desk research consists of a behavioral science-focused literature review on insights about the specific challenge as well as insights from similar challenges and a documentation review to become familiar with the context. We also create a user journey to map the steps for people to follow to complete the target behaviors. We do a stakeholder mapping to better understand the context. Lastly, we analyze why people do or do not engage in the target behaviors through behavioral science lens. The outcome of this phase will be a journey map highlighting barriers and enablers of the target behaviors.

Phase 3. Solution

Third, building on the findings and insights at the Explore phase, we design an effective intervention. We generate and brainstorm intervention ideas and compile a list of potential intervention options. Subsequently, we prioritize and refine these ideas, considering factors, such as feasibility, cost-effectiveness, and potential impact. After choosing the most promising intervention, we move on to the design phase, where we create a prototype and gather user feedback through testing to ensure its practicality and user-friendliness. By the end of this stage, we will have a thoroughly designed and user-tested interventions ready for implementation.

Phase 4. Trial

Fourth, we put the interventions into action and assess their impact on the target behaviors. We prepare and sometimes implement experiments and randomized controlled trials (RCTs) to rigorously evaluate the interventions. We analyze the interventions' outcomes and identify key insights, lessons learned, and areas for future improvement. Based on the trial results, we can make informed decisions about whether to scale up the intervention or explore further enhancements.

Phase 5. Scale

Lastly, we determine the appropriate next steps based on the intervention outcomes. If the interventions prove to be impactful during the trials, we explore the constraints that may arise when scaling up the efforts. We aim to implement the successful intervention on a larger scale to achieve broader and more significant results. Conversely, if the interventions do not yield the indented impacts, we engage in a thorough examination of potential reasons for the lack of success. The analysis would help us identify areas of improvement or adjustment. Then, we can make informed decisions about whether to continue, refine, or discontinue the interventions.

Notably, as behavioral science could be used as a lens applicable to any public or private issues (Hallsworth, 2023), these phases delineate the applied scientific research processes ubiquitously applicable to any field, policy area, and discipline, including risk, crisis, and disaster communication. Applied research develops and solves immediate practical problems and/or develops products, unlike basic research, which is to learn about relationships among variables regardless of any products or services, while research involves systematic processes to formulate questions and secure valid answers (Reinard, 2007; Singleton & Straits, 2009). In other words, behavioral science could help reassess and re-diagnose situations or issues within risk and crisis communication. Now, we will turn to models and frameworks that could be used across these stages in the approaches.

Complementary Models and Frameworks

In this section, we introduce models and frameworks that complement the overall behavioral science approach presented above. These complementary behavioral science models and frameworks, such as the COM-B model, the EAST principles, and the MINDSPACE framework, provide some guidelines for specific stages in the overall behavioral science approach. For instance, the COM-B Model could be used for diagnosis to better understand challenges and opportunities to change people's behaviors, while EAST principles and MINDSCAPE framework could be used to build interventions.

To Complement Diagnosis: COM-B Model for Behavior Change

The COM-B model can be used to diagnose behavioral issues, opportunities, and barriers in the explore phase. It recognizes that many factors influence human behaviors and that such behaviors can change by modifying these factors (Michie et al., 2011; West & Michie, 2020, 2023). The COM-B model of behavior change proposes that, to engage in a behavior (B) at any given moment, a person must be physically and psychologically capable (C), have the opportunity (O) to exhibit the behavior, and the want or need (M) to demonstrate the behavior. The COM-B model and their constructs are consistent and aligned with other theories (Lim, 2022), such as the Motivation-Opportunity-Abilities (MOA) model (Ölander & Thøgersen, 1995) and the theory of planned behavior (TPB) (Ajzen, 2002, 2011).

Figure 25.2. The COM-B model for behavior change

Source: West & Michie (2020)

The COM-B model for behavior change has three key factors: capability (C), opportunity, (O), and motivation (M) (Michie et al., 2011; West & Michie, 2020, 2023). Specifically, capability is individuals' psychological and physical ability to participate in an activity, such as mental state, knowledge, and skills. For example, in the context of primary care professionals' chlamydia testing, primary care professionals without chlamydia testing training (i.e., physical capability) and knowledge (i.e., psychological capability) were less confident in conducting tests (McDonagh et al., 2018).

Opportunity is external factors that make a behavior possible (or difficult), such as physical, environmental, and social opportunities. For instance, for overweight and obese pregnant women to engage in physical activity, encouragement from women's partner or husbands and friends was helpful, whereas work and family commitment, time constraints, and lack of financial means often hindered them (Flannery et al., 2018).

Motivation is the conscious and unconscious cognitive processes directing and inspiring behaviors. Such motivation could be reflective (i.e., intentions to make plans) and automatic (i.e., impulses and inhibition). For example, for university students to use sexual health service, their perception as the university experience as a period of sexual exploration and experimentation

and trends towards normalizing sexual health worked as motivators for accessing sexual health services (Cassidy et al., 2018). Comparatively, stigma related to accessing sexual health services and lack of privacy and confidentiality could jeopardize university students' willingness to use the service (Cassidy et al., 2018).

To Complement Intervention Design: EAST Principles

One framework that helps develop interventions in the solution phase is the EAST principles. The EAST principles suggests that to encourage a behavior, policymakers can make it easy, attractive, social, and timely (Service et al., 2014).

Make it Easy. Policymakers can make a target behavior easy by changing defaults to the desired behavior, reducing the effort required to adopt the behavior, and using simple, clear, and easy-to-understand messages. For example, governments can make it easy for people to get vaccinated by making forgetting harder (e.g., an easy vaccination scheduling system, automated appointments for follow-up shots) and make access easier (e.g., bringing vaccination sites into the community with increased hours and locations) (Lim et al., 2022b). Providing a convenient link to a simple vaccination appointment scheduler increased the vaccination intention by 8.6%, but not vaccination rates (Jacobson et al., 2022). Also, once-a-month regular, well-publicized immunization clinics (or, vaccination camps) in the communities increased immunizations (e.g., BCG, DPT, polio, and measles) by 12% (Banerjee et al., 2010).

Make it Attractive. Policymakers can make a target behavior attractive by attracting attention by using images, colors, and personalization, and designing rewards and sanctions for maximum effect, such as financial incentives and lotteries. For example, governments have provided various types of incentives (e.g., small financial and non-financial incentives, large incentives, and lottery) to motivate people to get vaccinated (Lim et al., 2022b). For immunizations, such as measles, BCG, or flu, governments' small financial incentives (e.g., cash or mobile credit less than US$ 10) (Alsan et al., 2019; Banerjee et al., 2021; Gibson et al., 2017) and non-financial incentives (e.g., lentils and metal plates) (Banerjee et al., 2010) effectively increased vaccination rates. Conversely, for COVID-19 vaccination, in general, higher incentives could encourage more vaccinations, yet too large incentives can make people suspicious about the vaccine's risks (e.g., Campos-Mercade et al., 2021; Robertson et al., 2021; Serra-Garcia & Szech, 2023).

Make it Social. Policymakers can make a target behavior social by showing that most people perform the desired behaviors (or most people think that they should perform the desired behaviors), using the networks, and encouraging people to make a commitment to others. For example, as social norms perceptions strongly predict climate adaptation and disaster risk reduction behaviors (Lim, 2022), using injunctive social norms messages (e.g., what others believe should be done) significantly increased at-risk individuals' intentions to prepare for floods and hurricanes in the U.S., particularly with their preferred information sources (e.g.,

weather forecasters) (Lim et al., 2022a). Also, in the COVID-19 context, using descriptive and dynamic social norms message (e.g., many others in the community have already got vaccinated) increased vaccination intentions across countries (Bidani et al., 2022; Hoy et al., 2021; Lim et al., 2022b; Palm et al., 2021; Santos et al., 2021).

Make it Timely. Policymakers can make a target behavior timely by prompting people when they are likely to be most receptive, considering the immediate costs and benefits, and helping people plan their response to events. For example, when users like or share misinformation, some social media platforms (i.e., Facebook) have asked users to check misinformation by sending the notification with additional context, such as fact-checkers, its original source, and/or when it was first shared (Meta, 2021). Also, encouraging people to plan and write the time and date increased the behavior adoption for vaccination (Milkman et al., 2011) and colonoscopy (Milkman et al., 2012).

To Complement Intervention Design: MINDSPACE Framework

Another framework that helps develop interventions in the solution phase is the MINDSPACE framework. Started with an initiative by the UK Cabinet Office members and commissioned with the Institute for Government (i.e., a U.K. think tank) and academics, the MINDSPACE framework was designed by behavioral scientists for policymakers and industry leaders (Dolan et al., 2010, 2012). Dolan et al. (2010, 2012) developed the MINDSCAPE framework to complement current policymaking processes and methods to integrate behavioral science into them by switching the focus from the assumptions that people would analyze all information available and act in ways reflecting their best interests (i.e., reflective processing) to the assumptions that people would operate in the social contexts and sometimes make irrational choices (i.e., automatic processing) (Kahneman, 2011; Thaler & Sunstein, 2021; Vlaev & Dolan, 2009).

The MINDSPACE framework is a quick checklist of the nine robust, non-coercive influences on our behavior for use when making policy from social psychology, cognitive psychology, and behavioral economics (Dolan et al., 2010, p. 8): the messenger, incentives, norms, defaults, salience, priming, affect, commitments, and ego.

Table 25.1. MINDSPACE Framework

Influence	Explanation
Messenger	People are heavily influenced by who is communicating information.
Incentives	People's responses to incentives are shaped by predictable mental shortcuts, such as the strong desire to avoid losses.
Norms	People are heavily influenced by what others do.
Defaults	People "go with the flow" of pre-set options.
Salience	People's attention is drawn to novel things that seem relevant to us.
Priming	People's actions are often influenced by subconscious cues.

Affect	People's actions can be powerfully shaped by our emotional associations.
Commitments	People seek to be consistent with our public promises and to reciprocate actions.
Ego	People act in ways that make us feel better about ourselves.

Source: Dolan et al. (2010, 2012).

Some effects from the MINDSCAPE framework, such as norms, defaults, salience, and priming, have been developed to explain largely automatic processing's effects, whereas other effects, such as messengers, incentives, commitments, and ego, have been developed to explain reflective processing (Dolan et al., 2010, 2012; Vlaev & Dolan, 2009). For example, regarding messengers, insights from World Bank data collected from more than 25 countries suggested that healthcare professionals are the most trusted information source for COVID-19 vaccination, followed by family and friends (Bidani et al., 2022; Lim et al., 2022b). In Czech Republic, physicians' views around COVID-19 vaccination increased vaccine uptakes by 4 to 5%p over 9 months (Bartoš et al., 2022). These influences could have different impacts and implications in different risk, crisis, and disaster contexts. The MINDSCAPE framework also noted that policymakers have been also influenced by the same heuristics and biases in their work (Hallsworth et al., 2018).

In summary, we reviewed three models and frameworks complementary to the principle behavioral science approach (e.g., the TESTS approach). Specifically, the COM-B model to help diagnostics and formative research, and the EAST principles and the MINDSPACE framework to help design and develop interventions. Now, we will turn to the case study for hurricane risk preparation and response in Haiti to demonstrate how these models and frameworks reviewed could be applied to the practice.

Case Study: Hurricane preparedness and response in Haiti. An n prepare n pi plis toujou! [Let's be more and more prepared]

Using a case study on disaster preparedness and response efforts in Haiti, we will demonstrate how the general behavioral science approach (e.g., the TESTS approach) and complementary frameworks and models (e.g., COM-B model, the EAST principles, the MINDSPACE framework) could be used in the risk, crisis, and disaster communication across target, explore, solution, trial, and scale phases.

Phase 1. Background and Target

In Haiti, more than 91% of the households have been exposed to one or more weather and climate disasters, including hurricanes, floods, landslides, heat waves, and earthquakes, in their lifetime, and the poorest households suffer more than wealthier households (Canavire-Bacarreza et al., 2023; Lara Ibarra et al., 2023; Mejía et al., 2023). The human and economic impacts of these hazards have been severe. Between 1971 and 2014, the country experienced

more than 137 disasters, causing the death of more than 230,000 people, displacement of 1.5 million people, and losses estimated at 15% to 120% of Gross Domestic Product (GDP), or 2% of GDP on average per year (World Bank, 2015a). Because of a variety of structural (e.g., lack of resources, lack of access to shelters and transportation) and behavioral barriers (e.g., underestimated risks, distrust), many Haitians often have not undertaken disaster preparedness and evacuation behaviors (Llopis et al., 2020). Over 80% of Haitian households shared that they were not ready to cope with a disaster (Canavire-Bacarreza et al., 2023). Thus, the target behaviors were disaster preparedness and evacuation behaviors.

Phase 2. Explore

The World Bank's Disaster Risk Management team and eMBeD unit collaborated to understand the structural and behavioral barriers that limit evacuation decisions when Haitians are presented with a hurricane event and identify potential key strategies for effective evacuation (Llopis et al., 2020). Existing research and field evidence demonstrated the poor state of early warning systems and shelters, among others. Coupling these structural barriers with a behavioral approach looking at psychological and social barriers may strengthen Haiti's climate resilience. Frameworks like the COM-B model could be useful to diagnose behavioral issues, opportunities, and barriers. This exploration provided evidence and recommendations for interventions, including effective communication, in Haiti's complex context.

Method. To provide actionable solutions to safe evacuation, the World Bank, with support from the African, Caribbean and Pacific (ACP)-European Union (EU) Natural Disaster Risk Reduction Program, funded by the EU and managed by the Global Facility for Disaster Reduction and Recovery (GFDRR), conducted qualitative research (Llopis et al., 2020). It included desk (i.e., secondary) research, key informant interviews, and qualitative field work with focus groups and semi-structured interviews, using the convenient snowball sampling.

Desk Research (i.e., Secondary Research). An extensive desk research, or secondary research, of existing reports and research papers helped inform our understanding of early warning systems, disaster preparedness, and evacuation behavior in developing countries, including Haiti.

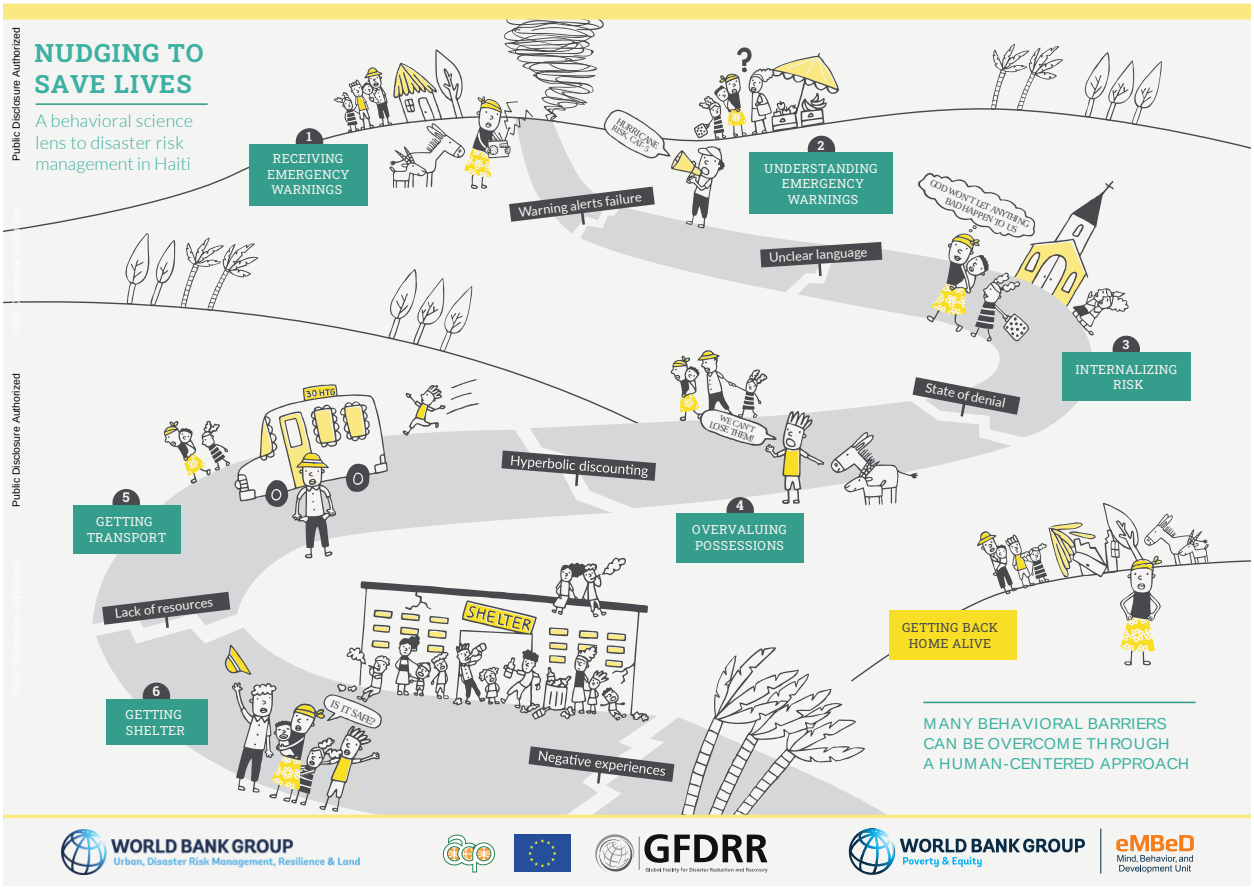
Key Informant Interview. Key informant interviews (n = 9) were conducted with the Civil Protection Directorate (Direction de la Protection civile [DPC]), government and national development counterparts working with the DPC (e.g., MSPP, MENFP), international organizations working on disaster risk management (e.g., UN OCHA, IOM, UNDP) to examine disaster management, preparedness, and evacuation policy decision-making processes in Haiti.

Fieldwork with Focus Groups and Interviews. Qualitative fieldwork was conducted through six focus groups and 16 semi-structured interviews with Civil Protection Committees (Comités Communaux de Protection Civile [CCPC]), community leaders, and the general

population in Paillant and Les Cayes municipalities to examine and compare evacuation decisions and behaviors in rural and urban areas.

Findings. This diagnostic provided insights into structural and behavioral barriers, including existing communication channels, preparedness and response capacity, and risk knowledge and internalization. This resulted in insights that are elaborated in Figure 25.3, including receiving and understanding emergency warnings, internalizing risk, perspectives on possessions, getting transport, and seeking shelter.

Figure 25.3. Behavioral Barriers to Hurricane Risk Protective Behaviors



Source: World Bank (2020a).

Warning Alerts Failure. Often, the population did not receive the alert messages, leading to a preventable outreach problem. The research phase showed that no reliable process existed to communicate information about an approaching storm to the entire population. Existing communication channels, such as door-to-door visits with volunteers' private vehicle or out-of-pocket transportation costs, flag system [red, yellow, and green colors], radio, SMS, public announcements, and megaphones, failed to share information to the whole population in a timely manner. While most people could use their own or peers' phone or radio, many do not have

resources to buy batteries or phone credits to receive and share alert messages. Municipal Civil Protection Committees, comprising volunteers from the community and coordinated by municipalities, were crucial to Haiti's disaster management system. These committees bridged the gap between institutions and the community, ensuring local emergency preparedness and response. However, constraints included limited funding needed for training, coordination, communication, and disaster response and recovery, insufficient training for unpaid volunteers with high turnover, and a lack of coordination and necessary equipment, including vehicles and radios, to disseminate messages. These constraints meant rural regions were particularly neglected. Further, these constraints were complicated by role conflict and misunderstanding with high turnover. Stakeholders, including mayors who were meant to relay information to Civil Protection Committees, which in turn needed to disseminate climate and weather disaster risk information to the population, may have misunderstood their roles and responsibilities.

Unclear Messages. When the information arrived, warning messages (e.g., Hurricane Wind Scale category) were not adapted to what the people in Haiti understood with their local education and literacy levels, resulting in people not knowing where to go or what to do. People often did not fully understand the messages (e.g., the flag color system, messages without explanations on why and consequences), given their complexity and lack of key information about the desired behavior. People would be more likely to evacuate when they had an accurate understanding of the severity of a storm. Also, a general distrust in the messengers existed. Because of their past neglects, State and its representatives seemed prioritizing their own interests. Civil Protection Committee members, although they were volunteers from the community, were often viewed as acting on behalf of the State and rarely validated as trustworthy sources. Prior false alarms and cry-wolf effects remained concerns (e.g., Kunreuther & Meyer, 2017; Lim et al., 2019a).

Risk Internalization. Even when information arrived and was understood, many people did not realize or accept their actual level of risk. With a strong presence of religion in Haitian society, many negated the information received because they did not want to believe it and think God would let such a disaster befall them (i.e., state of denial) (e.g., Lim et al., 2019b; McGeehan & Baker, 2017). With limited resources, others felt there was little they could do to prepare to save themselves, but to put faith in God (i.e., fatalistic belief). Lastly, given that they were not forced to evacuate, many preferred to stay with their possessions (e.g., houses) and livestock (e.g., goats, donkeys, and horses) in the hopes they could wait out the storm (i.e., hyperbolic discounting), as livestock was the households' main financial asset, and some people were afraid of looters with no police patrol after hurricanes.

Lack of Resources and Shelters. Even if people wanted to evacuate, they might have lacked resources and viewed shelters as unsafe. Many did not have an emergency evacuation shelter close to home, making it impossible to heed warnings if they lacked transportation. Vulnerable populations, such as people with disability, children, and older adults, were not

mapped and identified by volunteers. Also, there was a lack of shelters that could withstand hurricane force winds, especially in rural areas, and structures did not always abide by building codes and standards. Lastly, some shelters were shut down prior to the hurricane due to complications arising from their primarily being school facilities. Coordinating responsibilities among the Ministry of Education, Ministry of Interior, and Local Authorities were challenging (e.g., locating the individual holding the school keys).

Negative Experiences. Some people that had a bad experience in the past with collective shelters were hesitant to evacuate. Often, the experiences of collective shelters were bad as shelters were unsafe, and often lack resources (e.g., food, water, first aid supplies, beds, sheets), privacy, and proper oversight and management. Theft and sexual assault were rampant and unreported, while many mentioned that perpetrator were someone the victim knew, and others pointed out transactional sex with humanitarian aid distributions.

Phases 3. Solution

Based on the diagnostics in the explore phase, the team generated and brainstormed the intervention ideas to address structural and behavioral barriers to the hurricane risk preparedness and response behaviors (e.g., Llopis et al., 2020). In a complex context such as Haiti, potential solutions ranged from simplifying communication messages and channels, training messengers to deliver concise and persuasive messages, and using loss aversion framing to nudge people to internalize risk and evacuate. Models and frameworks, such as the EAST principles and the MINDSPACE framework, could help design and develop interventions.

Then, in support of the team, the Haitian Civil Protection General Directorate (DGPC) designed solutions as a part of the Strengthening Disaster Risk Management and Climate Resilience project (Pacifico, 2023; World Bank, 2019, 2020b). Acknowledging the complexities in comprehending early warning messages tied to threat levels and color codes, the Directorate developed a more easily comprehensible warning system. This was complemented by institutional measures, such as establishing disaster risk financing and emergency response plans. Collaborating closely with the Haiti Hydro Meteorology Unit, the Directorate created alert bulletins tailored to the local language, reinforcing appropriate and actionable behaviors for each phase.

Related to risk, crisis, and disaster communication, the Directorate launched a nationwide public communication campaign in August 2020, focusing on preparedness during the ongoing 2020 hurricane season, supported by the EU-funded Caribbean Regional Resilience Building Facility to enhance public knowledge of disaster risks and awareness (GFDRR, 2020; Pacifico, 2023; World Bank, 2019, 2020b, 2022b). The communication campaign targeted several obstacles: the failure of warning messages to reach recipients, the lack of comprehension and trust in the messages and messengers, distrust towards the messengers, and the challenge of getting individuals to truly grasp the risks involved (Pacifico, 2023).

To reach people throughout Haiti, the DGPC's disaster awareness campaign used various platforms commonly used by local communities. To tap into local culture, a music video collaborating with and featuring respected local musicians, Lòlò, Manzè, and Tafa, were broadcasted on national television and national and local radio, and shared on social media, capturing public attention with its rhythmic and engaging content, while emphasizing the importance of taking precautions. The campaign sent the disaster preparedness messages through SMS and audio messages. They partnered with community radio stations across the country, focusing on vulnerable and isolated areas. Additionally, a series of educational radio podcasts explained essential actions to be taken before, during, and after a hurricane, targeting people with limited literacy. With the context of the COVID-19 pandemic, the radio spots highlighted evacuation precautions, such as including face masks in emergency kits.

Figure 25.4. Music video for disaster communication in Haiti

Source: Pacifico (2023)

To further disseminate precautionary messages, the campaign partnered with the mobile technology company *Viamo* to distribute SMS messages and robocalls with concise safety information. Graphics were shared on social media platforms, government websites, and offline on brochures and billboards.

Figure 25.5. Disaster risk communication in Haiti

Note. Let's be more and more prepared. Hurricane season is already here.
Source: Pacifico (2023); World Bank (2020b)

Figure 25.6. Hurricane preparedness SMS message

Note. 'Hurricane season is here. Think with your family how you can protect your lives, your house, and your animals. For more information listen to the news and stay connected.' Source: Pacifico (2023).

Phases 4. Trial

The campaign successfully reached a minimum of 3.5 million Haitian individuals across various platforms, including music, radio, Facebook, and other channels (World Bank, 2020b). To elaborate, the campaign distributed SMS messages to 1.2 million recipients, alongside 30,000 audio messages tailored for the benefit of individuals with limited literacy. Moreover, the online, radio, and press components engaged approximately 1.15 to 1.3 million people, respectively (Pacifico, 2023).

The pre-post evaluation (n = 1,096) revealed significant increase in preparedness information received and preparedness behaviors taken (GFDRR, 2020; Pacifico, 2023; World Bank, 2020b, 2022b, in press). These positive outcomes were observed across diverse demographics, encompassing gender, educational attainment, and households with varying degrees of media accessibility. This progress was notably widespread, spanning the entire nation, including both rural and vulnerable regions. The study also underscores the pivotal role of traditional communication channels, primarily radio and SMS, as the primary conduits for disaster preparedness information dissemination.

Jerry Chandler, the Director of the Civil Protection General Directorate, emphasized the significant impact of the campaign by stating, "The activity was making a big difference. It's really giving us a boost in terms of communication to the public. What's important was to find ways to engage the public" (World Bank, 2020b). Lòlò, one of the musicians collaborated with the campaign and become a new trusted messenger for Direction de Protection Civile, mentioned: “This activity was key to build awareness of the risks associated with hurricanes and strengthen communication in preparation for an emergency situation.” (GFDRR, 2020, p. 61). These collective endeavors represent a step in the right direction to enhance resilience in Haiti against future adverse events. The World Bank continued to support countries with diagnostics and interventions on disaster preparedness and response.

Concluding Thoughts

As demonstrated by the case study, behavioral science approach can be used for more impactful risk, crisis, and disaster communication. Translating theoretical models into practical solutions can help individuals and communities particularly in outside of Western, educated, industrialized, rich, and democratic (WEIRD) societies in low and middle-income countries (Henrich et al., 2010), who have been often marginalized and understudied (Diers-Lawson, 2017), better prepare for, respond to, and recover from various risks and crises. A behavioral approach can also help better develop communication strategies that resonate with diverse populations across various fields, such as health, environment, climate and weather, and education, ensuring accessibility and understanding of vital information.

Moreover, it is crucial to address the often overlooked social and psychological factors in policies, programs, and services across various risks, crises, and disasters. By applying behavioral science, organizations can better respond to the multifaceted challenges posed by risks and crises. Policymakers could benefit by adopting the general behavioral science approach, like TESTS approach, coupled with complementary models and frameworks in their diagnostics (e.g., the COM-B model) and intervention design (e.g., the EAST principles, the MINDSPACE framework). The increasing number of organizations adopting behavioral lens and behavioral science units across various sectors reflects its growing recognition and potential impact in comprehensive risk management and emergency response efforts (Afif et al., 2019; Manning et al., 2020; OECD, 2017; Straßheim, 2020).

By approaching the issues from real-world people's perspectives and applying risk and crisis communication, organizations can holistically address the social and psychological dimensions of risks and crises in addition to the structural barriers, but also contribute to solving social problems. The behavioral approach enables a better understanding of human behavior, facilitates effective communication, and strengthens preparedness, response, and recovery efforts across various risks and disasters. Ultimately, the increasing adoption of the behavioral science in risk, crisis, and disaster communication will signify its potential to drive meaningful change and improve the overall resilience and well-being of individuals and communities in the face of uncertainties and challenges.

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