

How to activate nonprofit beneficiaries for community resilience? Examining the role of risk perception and evaluation of nonprofit services on prosocial behavior in the context of natural hazards

Hyunseok Hwang, R. Patrick Bixler, William A. Brown & Arnold Vedlitz

To cite this article: Hyunseok Hwang, R. Patrick Bixler, William A. Brown & Arnold Vedlitz (2024) How to activate nonprofit beneficiaries for community resilience? Examining the role of risk perception and evaluation of nonprofit services on prosocial behavior in the context of natural hazards, *Sociological Spectrum*, 44:1, 16-37, DOI: [10.1080/02732173.2023.2279968](https://doi.org/10.1080/02732173.2023.2279968)

To link to this article: <https://doi.org/10.1080/02732173.2023.2279968>



Published online: 15 Nov 2023.



Submit your article to this journal [↗](#)



Article views: 639



View related articles [↗](#)



View Crossmark data [↗](#)



Citing articles: 10 View citing articles [↗](#)



How to activate nonprofit beneficiaries for community resilience? Examining the role of risk perception and evaluation of nonprofit services on prosocial behavior in the context of natural hazards

Hyunseok Hwang^a, R. Patrick Bixler^b, William A. Brown^c, and Arnold Vedlitz^d

^aDepartment of Sociology, University of Houston, Houston, Texas, USA; ^bRGK Center for Philanthropy and Community Service, LBJ School of Public Affairs, University of Texas at Austin, Austin, Texas, USA; ^cCenter for Nonprofit and Philanthropy, Bush School of Government and Public Service, Texas A&M University, College Station, Texas, USA; ^dInstitute for Science, Technology and Public Policy, Bush School of Government and Public Service Texas A&M University, College Station, Texas, USA

ABSTRACT

Nonprofit organizations serve an essential role in response to natural hazards by delivering services to affected communities and those in need. However, little is known about the drivers of nonprofit-resident engagement during and aftermath of emergencies. Utilizing survey data collected in Austin, Texas, we address this gap by analyzing how beneficiaries of nonprofit services become donors and/or volunteers. Specifically, this study empirically analyzes how risk awareness and perceived nonprofit responsiveness and satisfaction (i.e., evaluation of services) influence beneficiaries' donation and volunteering during and after natural hazards. This relationship between risk awareness, evaluation of nonprofit services, and prosocial behaviors is understudied but extremely salient in the context of the expanding role of nonprofits on the frontlines of increasing frequency and duration of extreme weather events. The results indicate that the mediating role of citizens' evaluation of nonprofit services in the relationship between risk awareness and prosocial behavior is evident, despite the lack of significant direct effects of risk awareness on prosocial behavior. This study offers new perspectives to understanding the co-production of nonprofit services and mobilizing community resources to prepare, respond, and recover from climate impacts and informs ongoing conversations in urban sociology and the sociology of disaster.

Introduction

The U.S. is regularly affected by a set of natural hazards including hurricanes, floods, extreme heat, and winter storms. As government resources, both financial and human, are stretched and often not able to provide all needed services, nonprofit organizations increasingly play a significant role in providing services to communities before, during, and after climate and extreme weather events (Andorfer and Otte 2013; Berrebi, Karlinsky, and Yonah 2021). Especially, in the response and recovery stages, a primary role of nonprofit organizations is to provide necessary services and locally available resources to vulnerable populations often in close cooperation with government agencies (Brown 2017; Jenkins et al. 2015). As the frequency and severity of extreme weather events increase, the role of a nonprofit to provide services and mobilize community resources will be significant for local preparedness and response (Gazley et al. 2022).

CONTACT Hyunseok Hwang  hhwang6@central.uh.edu  Department of Sociology, University of Houston, Houston, TX, USA.

While there have been many studies examining the role of nonprofits in times of crisis, little is known about the perspectives of nonprofit beneficiaries regarding the services provided (see, for example, Curnin and O'Hara 2019; Fu and Cooper 2021; Jenkins et al. 2015). Additionally, research on community residents impacted by natural hazards reveals that individuals often show prosocial behaviors in times of need due to ingroup sympathy and spontaneous motivations (Maki et al. 2019). However, despite this research, few studies have considered the influence of beneficiary attitudes on the tendency to support local nonprofits or on prosocial behavior after events (Benjamin 2021; Farewell, Shier, and Handy 2019). In this study, we examine the mechanisms that lead beneficiaries to co-produce nonprofit services and mobilize community resources through prosocial behaviors, such as donating and volunteering (Campbell and Lambright 2016).

Researchers and nonprofit leaders have modest insight into how citizens, especially beneficiaries in the context of emergency response and recovery, perceive services, rate service satisfaction, and how those evaluations affect their views of the efficacy, importance, and value of nonprofits in emergency situations (Benjamin 2021). Importantly, research on how beneficiaries' perspectives on nonprofit services (i.e., effectiveness and satisfaction) lead them to donating and volunteering is underexplored. For nonprofits, financial (i.e., donations) and human (i.e., volunteers) contributions are important assets to sustain the organizations and serve the community. Local nonprofits providing vital and indispensable human services highly rely on collective donations from community residents rather than a few wealthy donors (Paarlberg and Hwang 2017). As such, satisfying beneficiaries with quality services and responsiveness in times of need is important for local nonprofits to mobilize resources from beneficiaries to advance organizational missions and goals (Schneider 2009).

Based on survey research in the Austin Metropolitan Area of Texas, we test the relationship between residents' risk awareness of natural hazards and an individual's willingness to co-produce nonprofit services by donation and volunteering based on how they perceive nonprofit services in the context of extreme weather and other climate related events. Based on community residents' evaluation of the responsiveness of and satisfaction with nonprofit services and programs, along with the other theoretical perspectives noted above, we examine beneficiary decisions on whether or not to contribute to or volunteer for nonprofits after receiving help from the nonprofits during or in the aftermath of a climate impact.

Our contributions to urban sociology and sociology of disasters are 3-fold. First, beneficiaries' perspectives on nonprofit services have been understudied, and our research contributes by asking survey participants that reported receiving services from nonprofits (i.e., beneficiaries) to rate two dimensions of nonprofit performance (responsiveness and satisfaction with services received). This approach explicitly recognizes beneficiaries as important social actors offering practical implications to local nonprofit organizations working in emergency response and recovery (Benjamin 2021). Second, our study extends knowledge of how community residents decide to contribute to local nonprofits. Examining the drivers of prosocial behavior has implications for facilitating collective efficacy at the community level (Meléndez and Martinez-Cosio 2021). Third, we introduce hazard risk awareness, conceptualized by experiences and preparedness of natural hazards, as a significant variable that affects their prosocial behavior through perceived evaluation of nonprofit responsiveness and service satisfaction. We find this has a significant influence and a more informed understanding of this relationship is important for conceptualizing co-production of nonprofit services in emergency response and recovery and how nonprofit organizations may be able to turn their beneficiaries into actual contributors and volunteers (Table 1).

Literature review

Nonprofit roles in times of crisis

During and in the aftermath of natural hazards, government agencies are required to manage emergency response in collaboration with nonprofits. Government resources are not always

Table 1. Description of concepts and variables.

Concept	Variable	Description	Relationship to prosocial behaviors
Risk awareness	Natural hazard experience (NHE)	The mere experiences in natural hazards, which affects respondents' risk perception of upcoming natural hazards.	Community members who have experienced natural hazards have more sympathy and affection to vulnerable populations (Berrebi, Karlinsky, and Yonah 2021).
	Preparedness (PRD)	Citizens' active action to mitigate the negative impacts of natural hazards, distinguished from mere experiences of natural hazards and considered as the high level of risk perception.	Action to mitigate the negative impacts of natural hazards can refer to civic engagement to resolve social problems, which might indicate the strong relationship to supporting community resilience policy (Meyer et al. 2016).
Evaluated nonprofit performance	Responsiveness (RES)	Organizational performance based on beneficiaries' perceived views.	Nonprofit effectiveness during natural hazards leads to achieve goals and missions to service beneficiaries, which attract local residents to become contributors to the nonprofits (Bryan 2019).
	Satisfaction (SAT)	Beneficiaries' satisfaction with the services provided by nonprofits.	Based on customer-based satisfaction and by considering beneficiaries as service customers, beneficiaries' service satisfaction leads individuals to prosocial reaction to nonprofits (Hutton et al. 2021).

sufficient and equally distributed to affected populations and communities (Domingue and Emrich 2019). Therefore, to fill the gap left by limitations of government resources, disaster-relief or human service nonprofits perform essential roles at all levels by providing indispensable and necessary services to affected community residents (Hutton et al. 2021; Kim, Oh, and Jung 2010). For instance, environmental justice research has shown that minority communities are more burdened with risks in natural hazards (Bixler et al. 2021; Harrison 2016; Pearsall and Pierce 2017). Through cross-sector collaboration, nonprofits fill the gap to effectively respond to natural hazards often addressing structural inequities of emergency response (Comfort and Kapucu 2006). Government agencies (at all levels) and nonprofits play their respective roles in emergency response and recovery, yet community residents often heavily rely on locally available aid provided by local nonprofits (Hwang and Joo 2021).

Local nonprofits provide indispensable social services to residents who have experienced natural hazards before government assistance (e.g., FEMA's Public Assistance disaster aid) arrives in communities (Brudney and Gazley 2009; Domingue and Emrich 2019). As natural hazards, such as flooding, storms, and extreme heat become more frequent due to climate change, community residents are more likely to depend on nonprofit service delivery for community well-being (Hutton et al. 2021). The American Red Cross and its regional chapters are a primary nonprofit actor, which is the only nonprofit organization designated by Congressional Charter for disaster-relief response and recovery (Brudney and Gazley 2009). Approximately 50 other major national voluntary organizations in the United States have made disaster-related work a priority through a coalition known as Voluntary Organizations Active in Disaster (VOADs) and work in close coordination with government services in disaster situations. These major disaster-relief nonprofits are considered *primary responders* and are routinely involved in all stages of emergency management (i.e., planning, response, recovery, and mitigation).

Primary responders have specific roles in emergency response and recovery as routine collaborators with government agencies. For example, in Texas, there are 36 nonprofit organizations that comprise Texas VOAD (Texas VOAD 2023), and their roles are specified as partners to the

Texas Division of Emergency Management (TDEM) that runs emergency operation plan (EOP) as a state agency in charge of the emergency operation center (EOC) (TDEM 2023). When extreme weather events, such as Hurricanes or winter storms are identified and assessed, the EOC activates tasks for population protection and incident management with the primary responders. For example, in the early COVID-19 pandemic, major primary responders undertook their roles in collaboration with federal and state-level government agencies (Liu, Xu, and John 2021). The Texas EOP provides a framework for coordination and cooperation among government agencies and nonprofit partners (<https://www.tdem.texas.gov/response/races>) that includes primary nonprofit responders, yet frequently local community and/or secondary responders are very engaged in the response and recovery of extreme weather events.

Secondary responders include human service organizations that provide a broader suite of social services and non-routine disaster relief services (Gazley and Brudney 2009). Secondary responders often provide ad hoc services as non-routine operational programs when communities are or have recently experienced extreme weather events and are without food, electricity, shelter, or other essential services. In reaction to the ad hoc response role, some secondary nonprofits have also started programs to assist residents to better prepare for the impacts of extreme weather.

Although local nonprofits play an essential role in helping residents during and after emergencies, they often suffer from a lack of financial and human resources due to a decline in per capita donation and volunteering rates (Paarlberg and Hwang 2017). The ability of nonprofits to survive and be able to provide quality services depends on their capacities to secure both financial and human resources (Lee, Park, and Kim 2023). Since the primary responders are routinely involved in emergency activities as specified collaborators with government agencies, they receive routinized government grants. On the other hand, secondary responders don't have access to the same levels of government grants and instead rely on contributions (financial and volunteering) from the local community (Brudney and Gazley 2009).

Limited evidence suggests that residents who receive support from local nonprofits during or after emergencies may be more motivated or incentivized to give something back and become an active contributor to the nonprofit (Berrebi, Karlinsky, and Yonah 2021). Social psychology research reveals that prosocial behavioral reactions following natural disasters show cooperation and coordination at the higher levels of community actors based on altruistic motivations (Maki et al. 2019; Smith and McSweeney 2007). However, little is known about how beneficiaries evaluate nonprofit services during or after the hazard event and if or how that shapes the decision to become an active contributor to the nonprofit.

Risk awareness of natural hazards and prosocial behavior

In non-emergency situations, individuals' prosocial behaviors in donation and volunteering are affected by both altruistic motivations and private gain for reputation and tax-deduction (Bekkers and Wiepking 2011; Paxton 2020). Their prosocial behaviors in donation and volunteering are rational rather than spontaneous (Bekkers and Wiepking 2011). Research also suggests there are numerous factors that influence and predict the tendency of individuals to donate funds (Auger and Cho 2021; Knowles, Hyde, and White 2012; Konrath and Handy 2018) and to volunteer (Clary and Snyder 1999; Liu and Aaker 2008; Wilson 2000). In addition, Auger and Cho (2021) found a positive association between nonprofits' service quality and beneficiaries' intentions to support the organizations, which means that organizational accountability and reliability influence beneficiaries' decisions to co-produce nonprofit services. Mitchell and Clark (2021) also found that awareness and familiarity with nonprofits are associated with volunteering engagement.

On the other hand, during times of crisis, individual prosocial behaviors are significantly influenced by the context of external threats and social environments. Individuals' risk awareness

can increase with experiences of extreme natural events, which leads them to a high level of preparedness for upcoming natural hazards (Castañeda et al., 2020). The greater risk awareness of natural hazard stressors triggers a variety of behavioral responses (Park and Vedlitz 2013; Scolobig, De Marchi, and Borga 2012). Research extends our understanding beyond demographic and motivational factors to understand individuals' attitudes and experiences with human service or disaster relief nonprofits and how those experiences influence the tendency and/or action to support nonprofits (Bekkers and Wiepking 2011; Katz 2018). According to the social support model, individuals are more likely to give to nonprofits because of increased feelings of compassion and empathy for fellow people that experienced traumatic events (Berrebi, Karlinsky, and Yonah 2021). In extreme cases, such as Hurricane Katrina of 2007, individuals might show some destructive and aggressive behaviors; however, in many cases of natural hazard events, collective and individual prosocial behaviors have been witnessed (Kirk 2009). Considering social and psychological effects, prosocial behaviors to support nonprofits are beneficial to pursuing self-interest and altruistic motivations to mitigate the negative impacts of upcoming natural stressors on the community.

Nonprofit scholars have investigated the relationship between prosocial behaviors, such as charitable giving (or volunteering) and sociodemographic factors (i.e., gender, political ideology, income, education, age, race, and religion) at the individual level (Bekkers and Wiepking 2011; Clerkin et al. 2013; Wilson and Musick 1997). Especially, community residents' risk awareness of natural hazards might lead them to prosocial behaviors in contributing either their money or time to nonprofits because helping nonprofits expands community level civic capacity and promotes for collective efficacy (Meléndez and Martinez-Cosio 2021; Sampson, Morenoff, and Earls 1999). Community residents who are informed about the risks of natural hazards might be more inclined to prevent their communities from adverse impacts by displaying prosocial behaviors, such as volunteering and donating. Hence, individuals' risk awareness of natural hazards can affect preventive attitudes by supporting nonprofits responding to emergencies (Basolo et al. 2009; Meyer et al. 2016; Trumbo et al. 2014). Furthermore, negative experiences and the social memory of natural disasters lead individuals to become part of co-producing nonprofit services through donations or volunteering (Grimalda et al. 2021).

Much is known about those who volunteer to help in disaster situations. Researchers have demonstrated the role of individual altruism, motivation, and encouragement provided by local nonprofits (for a recent overview see Phillips 2020). In the context of the COVID-19 pandemic, individuals exposed to pandemic's negative impacts show the high levels of prosocial behaviors in donation (Gotham, Lauve-Moon, and Powers 2017; Grimalda et al. 2021). Unlike nation-widely recognized threats like the COVID-19 pandemic, local disasters require more collective efforts to support local nonprofits because natural hazards at the local level do not get much of media attention, which does not lead to an increase in charitable giving. Likewise, individuals' prosocial behaviors are influenced not only by intrinsic altruistic behaviors but also by the circumstances of existential threats (e.g., natural hazards, epidemics, and pandemics) that enhance prosociality for collective efficacy.

In this study, risk awareness is conceptualized as having two dimensions: (1) natural hazard experience and (2) preparedness (Scolobig, De Marchi, and Borga 2012). The development of measures for risk awareness has been limited, and scholars use different types of measurement (Trumbo et al. 2014). Research suggests that risk awareness is determined by attitudes, thoughts, and experiences (Mızrak et al. 2021). As using an experiential measure, natural hazard experience may traumatize both individuals and communities, but such experiences do help identify the potential risks associated with hazards when preparing for natural hazards (Lindell 2013). In addition, the greater risk awareness of hazard experience is highly associated with the greater preparedness (Basolo et al. 2009). Hence, preparedness conceptually represents personalized behaviors related to risk awareness of natural hazards (Scolobig, De Marchi, and Borga 2012). In

sum, we posit that the higher risk awareness of natural hazards is associated with prosocial behaviors in donating to and volunteering for local nonprofit organizations.

***Hypothesis 1:** The greater the resident's risk awareness of natural hazards the greater the resident's prosocial behavior in support of nonprofits.*

Perceived evaluation of nonprofit services

For nonprofit organizations that focus on ad-hoc social services, an important role during natural hazards is providing immediate and indispensable services to vulnerable and affected community residents. Nonprofits' services to deliver such disaster relief services responsively, effectively, and fairly are an integral part of how their services are viewed by beneficiaries. Nonprofit service is defined as the means that nonprofits achieve their organizational goals and missions while using available resources to serve their constituencies (Bryan 2019). Nonprofit organizations are often evaluated by the accumulation of financial resources, organizational strategy, and board governance (Benjamin 2010; Carman 2011; Lambright 2008). However, the success of nonprofit services can be evaluated by multiple models to build the effectiveness of services for community members (i.e., beneficiaries) and community social capital (Bixler and Springer 2018; Bryan 2019; Paynter and Berner 2014).

Some critiques point out that the existing evaluation measurements for nonprofit services lack beneficiaries' perspectives (Campbell and Lambright 2016; Ebrahim 2005). By embracing service beneficiaries as core stakeholders and social actors, nonprofit organizations can gather critical views and co-produce their services, which ultimately contributes to success in organizational accountability and community sustainability (Ebrahim 2010). Benjamin (2010) also points out that the existing literature on nonprofit service lacks beneficiaries' evaluation and perception of service effectiveness. As noted, although evaluating nonprofits' service is difficult because of the lack of standardized metrics, recognizing beneficiaries' perspectives, and satisfaction is also important for understanding how residents and nonprofits co-produce quality services and contribute to building collective efficacy (Vargas 2019).

In evaluating nonprofit services, achieving established goals is an integral element in helping to understand beneficiaries' perspectives (Cameron 1986). Herman and Renz (1997, 2008) emphasize that different stakeholders aim to achieve different goals. Among different goals, beneficiaries' evaluations might help achieve the shared goals of the nonprofits to provide better services for emergency response and recovery. By linking the constituency model (i.e., evaluated by beneficiaries) to the goal attainment model for nonprofit service evaluation, in this study, we conceptualize the evaluation of nonprofit services from beneficiaries' perspectives who have received actual help during natural hazards, and we approach such nonprofit service quality from two dimensions: beneficiaries' views of nonprofit responsiveness and beneficiaries' satisfaction with the services provided. The first dimension, nonprofits' responsiveness, measures a part of nonprofit services related to achieving organizational goals and missions and serving constituencies by providing immediate and timely help to community members (Bryan 2019).

Responsiveness is related to building organizational capacity in times of crisis, including goal attainment (Cameron 1986). This evaluation of timely responsiveness can motivate residents and beneficiaries to contribute their money and time to nonprofits because beneficiaries might perceive it highly responsive assistance in the context of natural hazards (Domingue and Emrich 2019). In this study, we view nonprofit responsiveness as beneficiary evaluations of the timely services in emergency response and recovery. Research suggests that increasing the level of a sense of similarity and commonality between beneficiaries and donors promotes individuals' contributions to nonprofits (Chapman et al. 2022). In addition, community residents are more likely to help other people who live near them (James and Zagefka 2017). Therefore, the process that turns beneficiaries into donors or volunteers can be considered effective local philanthropy that

collectively generates long-term values and resolve the most important social issues both for community residents and nonprofit organizations (Hwang and Joo 2021). We posit that greater perceived evaluation of nonprofit responsiveness may lead to greater support for local nonprofits.

Hypothesis 2a: *The greater the respondent's perceived evaluation of nonprofit responsiveness in a disaster or emergency situation, the greater the respondent's prosocial behavior in support of nonprofits.*

Evaluated nonprofit services are also derived from public confidence and trust in the quality of services, which leads to service satisfaction. If beneficiaries of nonprofit assistance during natural disasters are satisfied with the services provided, it is likely that their perception of the value and loyalty toward the organization will increase, potentially resulting in greater support for the nonprofit within their local community. The other dimension of the perceived evaluation of nonprofit services is conceptualized with beneficiaries' satisfaction. The idea of customer-based satisfaction can be extended to the context of nonprofit services since beneficiaries receive necessary resources and services from nonprofits. Borrowing the concept of customer-based satisfaction from the business model, beneficiaries' (i.e., who received help) perspectives on service satisfaction may be linked to resident actions to support for the nonprofit organizations that tried to help them (Teodoro and An 2018).

In public service provision, residents are often considered as consumers or service users who received public goods and services, underling New Public Governance perspective (Alford 2009; Paarlberg and Gen 2009; Osborne 2018). In line with this reasoning, nonprofit service beneficiaries are analogous to the "consumers" or "service users" of indispensable and necessary goods and services during the times of crisis. To the extent that the beneficiary-consumer (or service users) concept holds, their satisfaction might lead to donation and volunteering, which ultimately benefits beneficiaries again in upcoming crises as co-production of nonprofit services. In addition, service satisfaction enhances the cognitive favorability of the nonprofit organization (Campbell and Lambright 2016), which turns in beneficiaries would seek for help again by contacting the nonprofit that previously offered services. The direct public perception of satisfaction with nonprofits' service and procedures for them in their time of need is an important second attribute that we include in defining the evaluated nonprofit services (Hutton et al. 2021). In this study, we also conceptualize and link the perceived evaluation of nonprofit services with the actual satisfaction of community residents who received help from the nonprofits and posit that the greater satisfaction leads beneficiaries to greater personal support for nonprofits.

Hypothesis 2b: *Greater respondent service satisfaction, from their direct experience, leads to greater prosocial support of nonprofits.*

We delineate two dimensions of nonprofit activity that define the perceived evaluation of nonprofit services: perceived responsiveness and personal satisfaction with the services received. Alongside the direct impact of evaluated nonprofit services in incentivizing prosocial behaviors as active agents of nonprofits, within the context of natural hazards, the beneficiaries' perceived evaluation of nonprofit services (i.e., responsiveness and satisfaction in this study) can assume a mediating role in motivating individuals with a risk awareness of natural hazards to contribute funds or volunteer for their local nonprofits (Yang 2016).

The reflection of beneficiaries' evaluation regarding the provision of essential nonprofit services during natural hazards can effectively play a mediating role between their risk awareness and becoming supporters. The antecedent of individuals' risk awareness can also influence both their prosocial behavior and their perceived evaluation of nonprofit services. As nonprofits collaborate with other institutional actors (such as government agencies) in the preparation, response, and recovery phases of natural disasters, heightened risk awareness from experiences and preparedness leads individuals to evaluate nonprofit services. There exists a mixture of evidence regarding the relationship between risk awareness and trust in government agencies within the context of natural hazards (Roberts, Archer, and Spencer 2021). Nevertheless, the consistency lies

in the fact that experiences with natural hazards cultivate more trust in nonprofits compared to government agencies (Hwang, Vedlitz, and Bixler 2023).

The influences of antecedents, such as risk awareness, can impact the perceived evaluation of nonprofit services due to residents' exposure to natural hazards and their subsequent preparations for upcoming events. As beneficiary perspectives become integrated into the planning of future nonprofit services, a mutually advantageous relationship between nonprofits and beneficiaries can be optimized (Guo, Metelsky, and Bradshaw 2014). Thus, we propose that the perceived evaluation of nonprofit services assumes a mediating role in effectively transmitting residents' risk awareness toward prosocial behaviors, including donations and volunteering.

Hypothesis 3: *The respondent's perception of nonprofit responsiveness and service satisfaction in natural hazards mediates the effect of risk perception on the respondent's prosocial behavior in support for nonprofits.*

Based on the hypotheses listed above, we propose to test the following relationships presented in Figure 1. We will empirically test the role that direct experience and personal satisfaction with nonprofit service delivery during the times of crisis, such as natural hazards have on respondents' prosocial reaction to donation and volunteering. The goal of this research is to test the relevance of direct beneficiary-based evaluation and satisfaction, controlling for other key social and attitudinal variables, on donation and volunteering behaviors and attitudes.

Methods

Data and study site

Data for this study come from the Austin Area Community Survey, an IRB-approved, primarily telephone survey conducted October–November 2020 as part of the Austin Area Sustainability Indicators project (www.austinindicators.org). The 2020 survey was the seventh wave of survey data collected dating back to 2004 (other years include 2006, 2008, 2010, 2015, and 2018). Data collection is cross-sectional, rather than panel, with a randomly sampled different population of respondents in each wave of data collection.

The geographic focus of the survey is the 6-county region including and surrounding the Austin Metropolitan Area, Texas: Travis County, Bastrop County, Burnet County, Caldwell County, Hays County, and Williamson County. Based on the Köppen Climate Classification, the Austin Area has a humid subtropical climate with long, hot summers and short, mild winters (Zhao 2018). Average high temperatures occur in July–August and range from 34 to 36 °C (93.2–96.8 °F), though long stretches of 100+ °F can occur. For example, 2018 recorded 52 days of over 100°, and 2019 recorded 57 days, respectively the 5th and 6th most in Austin

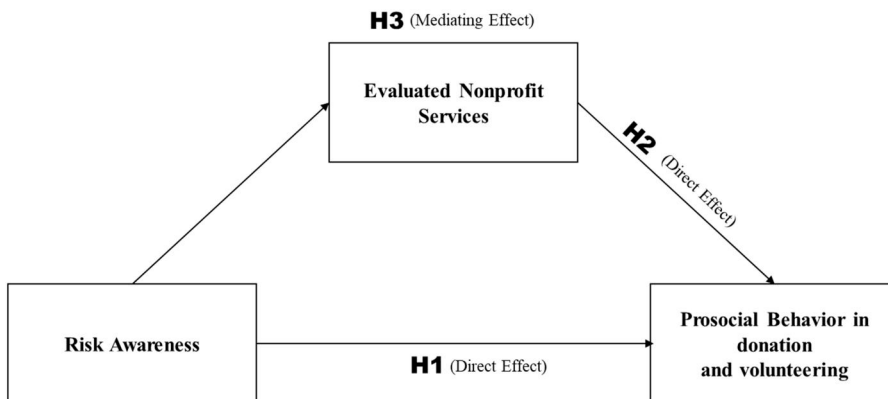


Figure 1. Conceptual framework.

records (the most occurring in 2011 with 90 days). Additionally, Austin is located in “flash flood alley” and experiences major precipitation events that cause fluvial and pluvial flooding. The Austin area experienced three 100-year flood events during a five-year span from 2013 to 2018. Exposure to both heat and flood risk is amplified by rapid urbanization, population growth, increased commercial and residential development, and subsequent expansion of impervious surfaces.

As longer duration temperature and precipitation extremes increase, the role of the nonprofit service in providing critical services to socially vulnerable populations (e.g., older or lower-income populations) is expected to increase. The 2020 survey included questions that were specifically designed for this study, including items related to risk awareness of natural hazards (i.e., flood, storm, and extreme heat) and perceived performance of government and nonprofits. Despite the recent hazard history in Austin, between 2015 and 2020, there were no federally declared disasters in the study area (two of the flood events were state declared disasters). Hence, this study examines how risk awareness of natural hazards, and the evaluation of nonprofit services affects beneficiaries’ prosocial behaviors as active social actors regarding localized extreme weather events and not catastrophic natural disasters.

The total sample size for the 2020 survey of 1,240 residents was selected for the $\pm 3\%$ margin of error it provides for the Austin metropolitan area (estimated 2020 population of 2.28 million) although the sample size for a series of analyses varies across the models. Data collection was completed through an external firm, Consumer Research International (CRI). The population frame was constructed through purchasing list-samples of both landline and cell phone numbers. From the population frame, a computer-generated random dial approach was employed. The phone surveys were conducted both in English and Spanish and certain sample quotas were established and met Hispanic and 18–24-year-old respondents to match Census statistics for those demographic categories. In addition to the telephone sample, $\sim 25\%$ of the total sample size were respondents from web-based panel procedures facilitated by CRI. *t*-Test comparison of group means between telephone and panel procedures showed minimal statistically significant differences between telephone and web-based procedures among the key variables of interest. The survey adheres to methodological and ethical procedures and definitions from the American Association for Public Opinion Research (AAPOR 2016).

The 2020 survey utilized skip logic for certain sections of the survey, including the questions about nonprofit services and satisfaction. The 2020 survey also asked questions related to specific climate impacts. Since flood and extreme heat are historically the most prominent climate-related impacts for the Austin area, those two natural hazards were the primary focus of inquiry. The questions related to nonprofit services and satisfaction, as well as the questions related to climate impacts, were included for the first time in 2020. The following operationally define the dependent, explanatory, and control variables based on our conceptual frameworks using questionnaires how we define each model, and precede method and analyses.

Analysis

For our cross-sectional analysis, we use structural equation modeling (SEM), as a mediation analysis adhering to Baron and Kenny’s (1986) conditions. SEM is widely used to estimate path coefficients, predictors (i.e., precursors or exogenous variables), mediators, and multiple dependent variables. This study measured residents’ risk awareness of natural hazards, the perceived evaluation of nonprofit services, and prosocial behaviors as support for nonprofits in either donation or volunteering. These are measured using different constructions. By employing a series of SEM analyses, we take an advantage by supporting the formulation of latent constructs for certain variables through regression to estimate coefficients among predictors (risk awareness of natural hazards), mediators (the perceived evaluation of nonprofit services), and dichotomous outcome

variables (supports for the nonprofits). A series of SEM analyses was performed in STATA using version 16 and a Maximum Likelihood (ML) estimator.

Measures

We constructed latent and count variables for explanatory (i.e., independent and mediating) variables. The dependent variables under this study are beneficiaries' decision to support nonprofits in donating and/or volunteering, conceptually framed as prosocial behaviors (Berrebi, Karlinsky, and Yonah 2021). One of the analytic explanatory variables is the risk perception of natural hazards, operationalized by two key variables: action and natural hazard experience (Meyer et al. 2016; Trumbo et al. 2014). The other explanatory variable is the perceived evaluation of nonprofit services, operationalized by two dimensions: nonprofit responsiveness and service satisfaction (Herman and Renz 2008; Bryan 2019). In addition to explanatory variables, we control survey respondents' socioeconomic and demographic characteristics. Detailed questions are described in Table 2.

Dependent variable: prosocial behaviors (i.e., supporting for nonprofits in donations and volunteering)

The dependent variable in this study is individual respondents' support for nonprofits that previously provided services to respondents during natural hazards, conceptualized as prosocial behaviors. Their reactions in supporting nonprofits allow community residents to participate in co-production of future nonprofit services and programs as active social and community actors (Benjamin 2021). In the questionnaires, listed organizations in Table 2 include nonprofits operating programs and providing services when communities are affected by natural hazards.

According to the literature, there are different social-psychological and economic mechanisms between donating money to and volunteering time for nonprofits (James and Sharpe 2007), and these different prosocial attitudes between donation and volunteering vary with individuals' socioeconomic and demographic characteristics (Grimalda et al. 2021; Paxton 2020; Wilson and Musick 1997). Although both supports for nonprofits provide essential resources (i.e., financial and human capitals), volunteering time requires more time and physical efforts rather than donating money to nonprofits. Especially, in post-disaster situations, many nonprofits are short-handed and require the sheer number of volunteers (Maki et al. 2019). Respondents chose from three response categories: donated money, volunteered, and/or both (Andorfer and Otte 2013). The two dependent variables are created as dichotomous variables: donated money (if respondents answered for donated money or both) and volunteered time (if respondents answered for volunteered time or both).¹

Explanatory variable 1: Risk awareness of natural hazards

As explained in the literature review with hypotheses, this study focuses on two explanatory variables. The first explanatory variable is residents' risk awareness of natural hazards measured by two variable constructions identified in the survey: (1) natural hazard experience and (2) preparedness measured by respondents' action or intention to act to mitigate impacts of natural hazards. Early research on risk awareness focused primarily on cognitive factors associated with understanding risk. Later, risk awareness scholarship conceptualized a multi-dimensional construct that considers experiences, attitudes, and behaviors (Perry, Lindell, and Tierney 2001). To account for the experiential awareness of natural hazard risk, a variable for natural hazard experience is included. In addition, for preparedness, respondents' cognitive attitudes (or responsive behaviors) for the risk awareness of natural hazards are measured by respondents' actual action or intention to mitigate adverse impacts of natural hazards as protective behaviors (Scolobig, De Marchi, and Borgia 2012).

Table 2. Survey questionnaire and construct.

Constructs	Items	Range
Natural hazard experience (NHE)	Has your household or neighborhood experienced any of the following natural hazards in the last ten (10) years? Natural hazards: flooding, extreme heat, wildfire, poor air quality, drought, hail, heavy wind, and dust storm	Yes or No
Preparedness (PRD)	Have you taken, or intend to take, any listed actions to mitigate the impact of (1) floods and (2) extreme heat - Purchase new air conditioner for home - Sign up to receive emergency alerts/warnings <i>via</i> text, email, or phone - Contact nonprofits or community groups for information on extreme heat - Contact governmental agencies for information on extreme heat - Attend a meeting to learn about extreme heat hazards - Talk to your neighbors about extreme heat - Purchase weatherization improvements for home - Learn about energy assistance programs - Learn the location of cooling centers near home	1 (No); 2 (Intend to); 3 (Yes) 1 (No); 2 (Intend to); 3 (Yes) 1 (No); 2 (Intend to); 3 (Yes) 1 (No); 2 (Intend to); 3 (Yes) 1 (No); 2 (Intend to); 3 (Yes) 1 (No); 2 (Intend to); 3 (Yes) 1 (No); 2 (Intend to); 3 (Yes) 1 (No); 2 (Intend to); 3 (Yes)
Responsiveness (RES)	Please tell me if you asked them for help. And, for the listed nonprofit organizations that you asked for help, did they try to help you? Red Cross, Salvation Army, United Way, Food Pantry, Community Groups, Legal Aids, Go Fund Me, or similar fundraising efforts	1 (Didn't ask); 2 (Asked); 3 (Organization helped)
Satisfaction (SAT)	Please tell me if the help you received from listed nonprofit organizations was very satisfactory, satisfactory, unsatisfactory, or very unsatisfactory? Red Cross, Salvation Army, United Way, Food Pantry, Community Groups, Legal Aids, Go Fund Me, or similar fundraising efforts	1 (Very unsatisfactory)–4 (Satisfactory)
Donation	Have you donated money to any of the listed organizations you received help from? Red Cross, Salvation Army, United Way, Food Pantry, Community Groups, Legal Aids, Go Fund Me, or similar fundraising efforts	Yes or No
Volunteering	Have you volunteered your time for any of the organizations you received help from? Red Cross, Salvation Army, United Way, Food Pantry, Community Groups, Legal Aids, Go Fund Me, or similar fundraising efforts	Yes or No

These two explanatory variables represent the concept of the risk perception of natural hazards as latent variable proxies.

In constructing the first latent variable for Natural Hazard Experience (NHE), respondents were asked whether their households or neighborhood experiences any of the listed natural hazards in Table 2. Responses to the question were coded as binary: 1 = respondents who had experienced each of listed natural hazards or 0 = respondents who had not experienced each of

listed natural hazards. The measurement for a natural hazard experience variable (NHE) was generated as a count variable. If a respondent experienced all of the listed natural hazards, it is coded to eight. In our data, a variable for natural hazard experiences ranges from 0 to 5. Eight percent of the respondents haven't experienced any of the listed natural hazards. The median count of natural hazard experiences is 3 in our data.

The second variable was constructed for preparedness (PRD) represented by respondents' action or intention to mitigate the impacts of natural hazards. We narrowly focus on the two types of natural hazards: floods and extreme heat because these two types are routine natural hazards with occasional negative impacts on populations (Bixler et al. 2021). The types of listed actions are described in Table 2. The measurement for an action variable was generated as a standardized factor score (Cronbach's alpha = 0.93). These two variables are treated as predictors of risk perception of natural hazards.

Explanatory variables 2: Evaluation of nonprofit services

The second explanatory variable is to measure the quality of nonprofit services perceived and evaluated by respondents, conceptualized as the perceived evaluation of nonprofit services. Only survey respondents that reported being impacted by a flood or extreme heat event were asked questions regarding receiving services after that event. Beneficiaries who received help may perceive nonprofit organizations as having responsive services. Conceptually, the perceived evaluation of nonprofit services consists of two dimensions: nonprofit responsiveness and service satisfaction. For the measurement of nonprofit responsiveness, respondents were asked whether a respondent asked for help from the listed nonprofit organizations. Initially, in the survey questionnaires, responses were recorded as Didn't Ask = 1; Asked = 2; Organization Helped = 3. Either respondents asked or each of the listed organizations voluntarily helped, they are coded as received help from each of the listed organizations (=1). In all cases, if a respondent reported asking for help, then the organizational helped. In some cases, the organization helped without asking. In both of those situations, they are coded as received help from each of the listed organizations (=1). Otherwise, they are coded as received no help = 0. If a respondent received help from all of the listed organizations in Table 2, it is coded to 6. A variable for nonprofit responsiveness is transformed into a count variable, ranging from 0 to 5. Seventy-one percent of all respondents received no help from any of the listed organizations: 29% of all respondents received help from at least one of the listed organizations.

The other dimension conceptualizing the perceived evaluation of nonprofit service is the measurement of service satisfaction. This is based on beneficiaries' perception and opinion how much they were satisfied with services provided by the organizations during and in the aftermath of natural hazards. To measure service satisfaction, we constructed a latent variable for [actual service] satisfaction. Responses were recorded as Very unsatisfactory = 1; Unsatisfactory = 2; Satisfactory = 3; and Very Satisfactory = 4.² The measurement for a service satisfaction variable was generated as a standardized factor score (Cronbach's alpha = 0.76).

Control variables

Several numbers of individual socioeconomic and demographic variables are included in a series of analyses. We included five control variables considered highly commonly studied sociodemographic predictors of giving and/or volunteering: gender, age, educational attainment, race, and income (Chapman et al. 2022). These control variables are coded in different ways. First, we included a variable to respondents' gender as a dichotomous variable either a male or female. Second, a variable for respondent's age was included as a continuous variable. Third, a dichotomous control variable for education is utilized by identifying whether respondents hold a bachelor's degree or above or not (holding a bachelor's degree or above = 1; otherwise = 0). Fourth, a

dichotomous control variable for minority status is used based on whether respondents are racially minorities or not (racial minorities = 1; non-Hispanic white = 0). Fifth, income is controlled for by utilizing a categorical variable with 10 categorical levels for household (i.e., family) income from under \$25,000 = 1 to over \$200,000 = 9.

Results

Using the Austin Area Community Survey data, we ran a series of regression and structural equation modeling (SEM) analyses on two dichotomous dependent variables: donation and volunteering. With linear regression analyses, we estimate the direct effects of explanatory variables (i.e., risk awareness and the perceived evaluation of nonprofit services) on two dependent variables (i.e., donation and volunteering). Then, with a series of SEM analyses, we examine the mediating role of the perceived evaluation of nonprofit services on the relationship between risk awareness and respondents' support for nonprofits. Before testing our hypotheses, the statistical fits are reported for four models.

Descriptive statistics and model fit criteria

Descriptive statistics and correlation in [Tables 3 and 4](#) indicate that 1 out of 10 respondents have donated to the listed nonprofits and 0.9 out of 10 respondents have volunteered for the listed nonprofits. For respondents' socioeconomic and demographic characteristics, the mean for age is 50 ranging from 18 to 94, and 4.5 out of 10 respondents hold bachelor's or above degrees. For their gender, 5.7 out of 10 respondents identify themselves as females. For racial minority status, 3 out of 10 respondents identify themselves as racially minorities, other than whites. With respect to income, the average is the fourth category of responses representing from the first category (under \$25,000) to ninth category (over \$200,000) with \$50,000 gap. Fit statistics in [Table 5](#)

Table 3. Descriptive statistics and correlation.

Variables		Mean	SD	Min	Max
1	Donation (DON)	0.10	0.30	0.00	1.00
2	Volunteering (VOL)	0.09	0.29	0.00	1.00
3	Natural hazard experience (NHE)	3.52	1.27	0.00	5.00
4	Preparedness (PRD)	0.06	0.69	-0.30	3.73
5	Responsiveness (RES)	0.64	1.23	0.00	5.00
6	Satisfaction (SAT)	0.05	0.68	-0.18	5.24
7	Age	50.05	17.81	18.00	94.00
8	Education	0.45	0.50	0.00	1.00
9	Race	0.30	0.46	0.00	1.00
10	Income	4.19	2.24	1.00	9.00
11	Gender	0.57	0.50	0.00	1.00

Table 4. Correlation table.

Variables	1	2	3	4	5	6	7	8	9	10	11
1 Donation (DON)	1.00										
2 Volunteering (VOL)	0.84	1.00									
3 Natural hazard experience (NHE)	-0.05	-0.05	1.00								
4 Preparedness (PRD)	0.13	0.10	0.18	1.00							
5 Responsiveness (RES)	0.58	0.55	-0.06	0.21	1.00						
6 Satisfaction (SAT)	0.71	0.65	-0.08	0.10	0.68	1.00					
7 Age	-0.09	-0.11	0.06	-0.23	-0.11	-0.09	1.00				
8 Education	0.05	0.04	0.08	0.01	0.00	0.10	0.17	1.00			
9 Race	-0.02	-0.01	-0.10	0.15	0.00	-0.04	-0.29	-0.17	1.00		
10 Income	-0.04	-0.08	0.05	-0.02	-0.19	-0.05	0.09	0.28	-0.11	1.00	
11 Gender	-0.03	-0.01	0.06	0.00	0.05	-0.02	0.00	-0.02	-0.01	-0.14	1.00

Table 5. Goodness of fit.

Goodness of fit	Model 1	Model 2	Model 3	Model 4
χ^2 (df, <i>p</i> -value)	458.94 (15, 0.000)	780.42 (15, 0.000)	408.74 (15, 0.000)	625.24 (15, 0.000)
CFI	0.92	0.974	0.909	0.967
RMSEA	0.091	0.063	0.091	0.063
SRMR	0.035	0.024	0.034	0.024

seem to be in the acceptable range for all models. CFIs for all models are above the 0.9 cutoff. SRMRs are below the 0.05 cutoff. Although RMSEAs are slightly above the 0.08 cutoff on Models 1 and 3 (0.091), they are still in the acceptable range (Bentler 1990; Kim et al. 2016; Shi and Maydeu-Olivares 2020). Reported Cronbach's alpha of all constructs for two latent variables (i.e., action and satisfaction) shows good internal consistency since all α values above 0.60 are acceptable (Garson 2010), which meet a reliability criterion. As the correlation of all constructs and variables is summarized in Table 3, all correlation coefficients are below 0.85. Thus, the discriminant validity for all constructs is acceptably established (Kline 2015). Across the models including explanatory and control variables, the mean Variance Inflation Factor (VIF) is 1.12 ranging from 1.03 to 1.18. Since the maximum VIF is 1.18 for the models, multicollinearity is not a concern.

Direct effects

We ran a series of linear regression analyses with respondents ranging from 854 (Models 1 and 3) to 1,009 (Models 2 and 4). The sample was slightly reduced because of missing values for some respondents on one or more relevant analytic variables. Linear regression analyses were run on the two dependent variables (i.e., donation and volunteering) models 1–4 (see Table 6). The regression analyses on the direct effects of two risk awareness variables were conducted with two different variables for the evaluation of nonprofit services on the dependent variables. In all four models, the direct effects of natural hazard experience (NHE) and preparedness (PRD) variables are marginally or not significant on both dependent variables in all models, which does not support our hypothesis 1.

To test our hypotheses 2a and 2b, we ran linear regression analyses models 1 through 4 again. Model 1 tested the direct effect of nonprofit responsiveness on donation, which shows the significance ($\beta = 0.143$, $p < 0.001$). Model 3 also indicates the nonprofit responsiveness is positively and significantly associated with donation ($\beta = 0.131$, $p < 0.001$). Models 1 and 3 support our hypothesis 2a suggesting the greater nonprofit responsiveness leads to the greater support for nonprofits both in donation and volunteering. Model 2 (satisfaction; $\beta = 0.310$, $p < 0.001$) shows the significance of service satisfaction effects on donation. On the dependent variable for volunteering, models 4 shows that a variable for service satisfaction has a positively relationship with respondents' volunteering prosocial behavior (model 4; satisfaction; $\beta = 0.275$, $p < 0.001$). Models 2 and 4 with a satisfaction variable support our hypothesis 2b. In sum, hypotheses 2a and 2b for the effect of the perceived evaluation of nonprofit services are supported by the results indicating the positive relationship with donating and volunteering prosocial behaviors.

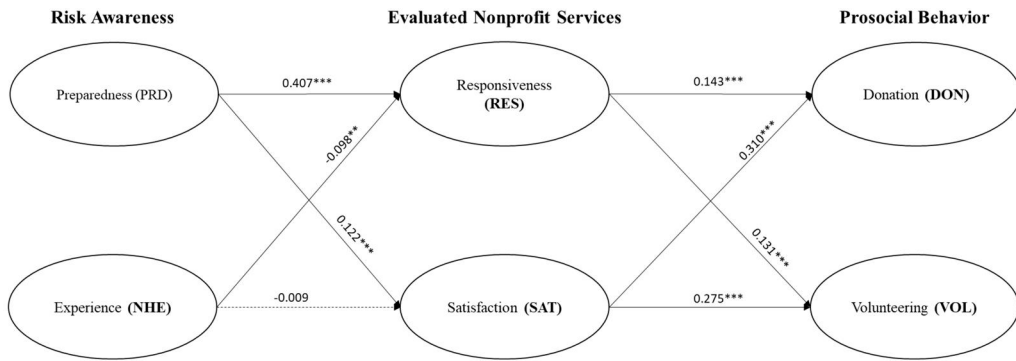
Indirect effects

To test our hypothesis 3, this study conducted the mediation analyses showing that the risk awareness of natural hazards indirectly affects prosocial behaviors with supports for nonprofits in donation and volunteering via two mediating variables measuring for the perceived evaluation of nonprofit services by beneficiaries. In Table 6, Models 1 and 3 of indirect effects examined the mediating effects of nonprofit responsiveness in the relationship between risk awareness of natural hazards and support for nonprofits in donation and volunteering. Since risk awareness is

Table 6. Comparison of the results across the models.

	Path	Direct effect	<i>p</i> -Value
Model 1	Natural hazard experience (NHE) → Donation (DON)	−0.005	0.450
	Natural hazard experience (NHE) → Nonprofit responsiveness (RES)	−0.098	0.003
	Preparedness (PRD) → Donation (DON)	0.000	0.971
	Preparedness (PRD) → Nonprofit responsiveness (RES)	0.407	0.000
	Nonprofit responsiveness (RES) → Donation (DON)	0.143	0.000
	Age → Donation (DON)	−0.001	0.152
	Education → Donation (DON)	0.024	0.176
	Race → Donation (DON)	−0.010	0.603
	Income → Donation (DON)	0.008	0.057
	Gender → Donation (DON)	−0.034	0.040
Model 2	Natural hazard experience (NHE) → Donation (DON)	0.003	0.514
	Natural hazard experience (NHE) → Satisfaction (SAT)	−0.009	0.466
	Preparedness (PRD) → Donation (DON)	0.025	0.013
	Preparedness (PRD) → Satisfaction (SAT)	0.122	0.000
	Satisfaction → Donation (DON)	0.310	0.000
	Age → Donation (DON)	0.000	0.670
	Education → Donation (DON)	−0.010	0.483
	Race → Donation (DON)	−0.001	0.919
	Income → Donation (DON)	−0.001	0.826
	Gender → Donation (DON)	−0.013	0.295
Model 3	Natural hazard experience (NHE) → Volunteering (VOL)	−0.004	0.579
	Natural hazard experience (NHE) → Nonprofit responsiveness (RES)	−0.098	0.003
	Preparedness (PRD) → Volunteering (VOL)	−0.009	0.468
	Preparedness (PRD) → Nonprofit responsiveness (RES)	0.407	0.000
	Nonprofit responsiveness → Volunteering (VOL)	0.131	0.000
	Age → Volunteering (VOL)	−0.001	0.038
	Education → Volunteering (VOL)	0.020	0.247
	Race → Volunteering (VOL)	−0.009	0.625
	Income → Volunteering (VOL)	0.003	0.415
	Gender → Volunteering (VOL)	−0.019	0.245
Model 4	Natural hazard experience (NHE) → Volunteering (VOL)	0.004	0.382
	Natural hazard experience (NHE) → Satisfaction (SAT)	−0.009	0.466
	Preparedness (PRD) → Volunteering (VOL)	0.015	0.150
	Preparedness (PRD) → Satisfaction (SAT)	0.122	0.000
	Satisfaction → Volunteering (VOL)	0.275	0.000
	Age → Volunteering (VOL)	0.000	0.199
	Education → Volunteering (VOL)	−0.009	0.511
	Race → Volunteering (VOL)	−0.003	0.827
	Income → Volunteering (VOL)	−0.004	0.205
	Gender → Volunteering (VOL)	−0.002	0.855
	Path	Indirect effect	<i>p</i> -Value
Model 1	Preparedness (PRD) → Nonprofit responsiveness (RES) → Donation (DON)	0.058	0.000
	Natural hazard experience (NHE) → Nonprofit responsiveness (RES) → Donation (DON)	−0.014	0.002
Model 2	Preparedness (PRD) → Satisfaction (SAT) → Donation (DON)	0.034	0.000
	Natural hazard experience (NHE) → Satisfaction (SAT) → Donation (DON)	−0.002	0.438
Model 3	Preparedness (PRD) → Nonprofit responsiveness (RES) → Volunteering (VOL)	0.053	0.000
	Natural hazard experience (NHE) → Nonprofit responsiveness (RES) → Volunteering (VOL)	−0.013	0.002
Model 4	Preparedness (PRD) → Satisfaction (SAT) → Volunteering (VOL)	0.034	0.000
	Natural hazard experience (NHE) → Satisfaction (SAT) → Volunteering (VOL)	−0.002	0.438

measured with two variables: natural hazard experience (NHE) and preparedness (PRD), we estimated two different indirect effects mediated by nonprofit responsiveness. The results indicate that two risk awareness variables are differently mediated by nonprofit responsiveness. In model 1 and 3, although preparedness is positively mediated by nonprofit responsiveness on donation (Model 1, $\beta = 0.058$, $p < 0.001$) and volunteering (Model 3, $\beta = 0.053$, $p < 0.001$), natural hazard experience (NHE) is negatively mediated by nonprofit responsiveness on donation (Model 1, $\beta = -0.014$, $p < 0.005$) and volunteering (Model 3, $\beta = -0.013$, $p < 0.005$) as visually described in Figure 2.



Note: Significant at *** $p < 0.001$, ** $p < 0.005$, * $p < 0.01$; robust standard errors in parentheses

Figure 2. Structural model of the serial mediations. Note: Significant at *** $p < 0.001$, ** $p < 0.005$, * $p < 0.01$; robust standard errors in parentheses.

Models 2 and 4 of indirect effects in Table 6 examined the mediating effects of residents' satisfaction with nonprofit services. The results indicate that satisfaction positively and significantly mediates the effects of preparedness on both donation (Model 2, $\beta = 0.034$, $p < 0.001$) and volunteering (Model 4, $\beta = 0.034$, $p < 0.001$) but does not significantly mediate the effects of natural hazard experience on both dependent variables. The indirect effects of risk awareness of natural hazards on the dependent variables via service satisfaction are visualized in Figure 2. In sum, the findings indicate that residents' evaluation of nonprofit services plays a significant mediating role because the direct effects of risk awareness on the dependent variables were not significant. However, the mediating role of service satisfaction does not transmit traumatic natural hazard experiences on prosocial behavior, but nonprofit responsiveness does as shown in Table 6.

Discussion and conclusion

The goal of this study was to examine the effects of risk awareness and evaluated nonprofit services on prosocial behavioral reactions in response to natural hazards. Specifically, this study views that nonprofit services evaluated by beneficiaries can positively turn the high levels of risk awareness into prosocial behavioral reactions to better prepare the community for future climate impacts. The results indicate that highly evaluated services of the nonprofits are positively associated with individuals' prosocial behaviors in donation and volunteering. However, the effects of risk awareness on prosocial behaviors vary with dimensions. Although hazard experiences do not necessarily have positive effects on prosocial behaviors, the effects of preparedness on prosocial behaviors reveal that these can be positively turned into donations. The results imply community residents with active preparedness are more easily transformed into prosocial behaviors as civic engagement in nonprofit services rather than experiences with natural hazards.

Our study reveals important new details in the attempt to understand how previous beneficiaries from nonprofit services turn into contributors, which will provide the better way of mobilizing collective resources as co-production of nonprofit services and a form of civic engagement limitedly in the Austin Area. Extant research has found how community social-demographic characteristics affect prosocial behavior and collective action for local philanthropy (Berrebi, Karlinsky, and Yonah 2021; Hwang and Joo 2021). However, little is known about how community residents' risk awareness influences their prosocial behavior that contributes to nonprofits and the mediating role of beneficiary-based evaluation of nonprofit services on the primary causal mechanism. Our study provides a novel model to attract previous beneficiaries to be co-producers of nonprofit services with donations and volunteering in preparing for upcoming natural hazards. The suggested models in this study can offer a key answer to enhance nonprofit service quality

by involving previous beneficiaries to be donors and volunteers as active social actors. Our findings note that this co-producing mechanism involving beneficiaries can more effectively occur when residents prepare to mitigate the negative impacts of natural hazards and fill the gap between demands and government assistance (Shughart 2006).

Community-based initiatives and philanthropic activities can provide support for victims, as well as rebuilding physical infrastructures through collective action and/or co-production. As climate change-induced natural hazards become more frequent, community residents are more likely to depend on nonprofit service delivery for community well-being rather than depending on the delayed government assistance (Hutton et al. 2021). Nonprofits will play an increasingly important role in aiding in the aftermath of hazards. Therefore, understanding the mechanisms that can lead to program sustainability and enhanced community resilience is critical.

Although national and local nonprofits account for indispensable and necessary humanitarian aid, there is a lack of financial (donation) and human (volunteering) resources in the nonprofit sector (Brudney and Gazley 2009). The substantial proportion of revenue streams is obtained from wealthy individuals' endowments, and nonprofits eagerly seek for additional methods generating supplemental revenues referred to as nonprofit marketization or commercialization (Eikenberry and Kluver 2004; Hwang and Lee 2023; Sandberg, Elliot, and Petchel 2020). In line with this view, closing the gap of perspectives between donors and beneficiaries contributes to nonprofit sustainability as active social actors while providing effective and quality services with satisfaction in response to natural hazards. Our research suggests that beneficiaries who positively evaluate nonprofit services can turn into continuing contributors to nonprofits.

This study seeks to understand what motivates and incentivizes residents living in natural hazard-prone areas to mobilize their resources for local nonprofits that provide social services during natural hazards. We also examine how beneficiary-based evaluation of nonprofit services plays a mediating role in turning beneficiaries into co-producers of nonprofit services as donors and volunteers. The high levels of nonprofit services evaluated by beneficiaries can ensure nonprofit sustainability in mobilizing continuing contributors of time and money. Our suggested model can be framed as a form of institutionalized collective action and beneficiary co-production for effective altruism and collective efficacy by mobilizing resources from beneficiaries, which enhances organizational capacity of the nonprofits as well as improves community conditions for residents (Ohmer 2010).

Although our study contributes to the new model to turn beneficiaries into potential contributors to secure organizational resources and enhance community resilience, there are several limitations to overgeneralization. First, the results are focused on a specific urban area, the Austin Metropolitan area, TX. While this area is quite diverse and provides a very useful testbed for these ideas, the sample is limited to a specific regional area. Also, the Austin area is not representative of the entire Texas because it is a predominantly liberal area in the red state. Future research on prosocial behaviors, nonprofit services, and risk perception in the context of natural hazards would benefit from broader, nation-wide surveys enabling greater control for regional context. Second, this study is not generalizable to apply to major national level natural disasters such as earthquake, major hurricane, or tsunami because the Austin area had not experienced federally declared natural disasters before the date when the survey was conducted. Future research is recommended to control types, sizes, frequency, and/or severity of disasters. Lastly, due to the limitations of survey questionnaires, our dependent variable captures only a limited number of nonprofit organizations that assisted respondents. There might be other nonprofit or community-based organizations that provided help to respondents, which were not captured in this study. Future research may expand the scope of nonprofit organizations to measure residents' prosocial behavior through donation and volunteering. Despite the limitation in the sample area of the survey, this study provides important and useful insights for policy makers, community leaders, and nonprofit organizations in the field of urban sociology and the sociology of disasters. The increasing threats on nonprofit resources and service qualities affect individual behaviors to engage in

donation and volunteering in response to and preparing for natural hazards. Our findings offer a greater understanding of donation and volunteering behaviors and suggest methods to enhance nonprofit and community sustainability by recognizing beneficiaries as central social actors.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Notes

1. Within the complete sample size, 8.06% of respondents (100 individuals) indicated that they had made donations to nonprofits providing help, while 7.42% of respondents (92 individuals) mentioned that they had engaged in volunteering for nonprofits offering help. Among the respondents who provided answers regarding both donations and volunteering, a total of 80 individuals reported participating in both activities.
2. If a respondent did not receive any help from the listed organizations, it is recorded as 0.

Funding

This work was financially supported by the RGK Center for Philanthropy and Community Service through funding to the Austin Area Sustainability Indicators program, Planet Texas 2050, a research grand challenge at the University of Texas at Austin, The Institute for Science, Technology, and Public Policy at Texas A&M University, The St. David's Foundation, The Michael and Susan Dell Foundation, and Center for Nonprofits and Philanthropy in the Bush School of Government & Public Service at Texas A&M University.

Author notes

Dr. Hyunseok Hwang is an assistant professor in the Department of Sociology at the University of Houston. His research interests include organization theory, community resilience, public & nonprofit management, and social entrepreneurship.

Dr. R. Patrick Bixler is an assistant professor at the LBJ School of Public Affairs with a joint appointment in the Community and Regional Planning program in the School of Architecture. His current research focuses on climate and environmental governance, urban sustainability and resilience, hazard preparedness and response, and network science.

Dr. William A. Brown is a professor at the Bush School of Government and Public Service at Texas A&M University and holds the Mary Julia and George Jordan Professorship. He serves as the Director of the Center for Nonprofits and Philanthropy. His research focuses on nonprofit governance, strategy, and organizational effectiveness. He has authored numerous research articles, technical reports, and several practice-oriented publications.

Dr. Arnold Vedlitz is a Professor, Distinguished Research Scholar of the Institute for Science, Technology and Public Policy, and holder of the Bob Bullock Chair in Government and Public Policy, Bush School of Government and Public Service, Texas A&M University. His research focuses on science and technology policy, public-private partnership, public policy, inter-group conflict, urban politics, and political psychology.

References

- AAPOR. 2016. "Standard Definitions: Final Dispositions of Case Codes and Outcome Rates for Surveys." In *Encyclopedia of Survey Research Methods*. Alexandria, VA: American Association for Public Opinion Research (AAPOR).
- Alford, John. 2009. *Engaging Public Sector Clients: From Service-Delivery to co-Production*. Berlin: Springer.
- Andorfer, Veronika A., and Gunnar Otte. 2013. "Do Contexts Matter for Willingness to Donate to Natural Disaster Relief? An Application of the Factorial Survey." *Nonprofit and Voluntary Sector Quarterly* 42 (4):657–88. doi: [10.1177/0899764012440180](https://doi.org/10.1177/0899764012440180).

- Auger, Giselle A., and Moonhee Cho. 2021. "Modeling the Antecedents and Outcomes of Perceived Relationship Investment (PRI) in Nonprofit Organizations." *Public Relations Review* 47 (4):102083. doi: [10.1016/j.pubrev.2021.102083](https://doi.org/10.1016/j.pubrev.2021.102083).
- Baron, Reuben M., and David A. Kenny. 1986. "The Moderator–Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations." *Journal of Personality and Social Psychology* 51 (6):1173–82. doi: [10.1037//0022-3514.51.6.1173](https://doi.org/10.1037//0022-3514.51.6.1173).
- Basolo, Victoria, Laura J. Steinberg, Raymond J. Burby, Joyce Levine, Ana Maria Cruz, and Chihyen Huang. 2009. "The Effects of Confidence in Government and Information on Perceived and Actual Preparedness for Disasters." *Environment and Behavior* 41 (3):338–64. doi: [10.1177/0013916508317222](https://doi.org/10.1177/0013916508317222).
- Bekkers, René, and Pamala Wiepking. 2011. "Who Gives? A Literature Review of Predictors of Charitable Giving Part One: Religion, Education, Age and Socialisation." *Voluntary Sector Review* 2 (3):337–65. doi: [10.1332/204080511X6087712](https://doi.org/10.1332/204080511X6087712).
- Benjamin, Lehn M. 2010. "Funders as Principals: Performance Measurement in Philanthropic Relationships." *Nonprofit Management and Leadership* 20 (4):383–403. doi: [10.1002/nml.20001](https://doi.org/10.1002/nml.20001).
- Benjamin, Lehn M. 2021. "Bringing Beneficiaries More Centrally into Nonprofit Management Education and Research." *Nonprofit and Voluntary Sector Quarterly* 50 (1):5–26. doi: [10.1177/0899764020918662](https://doi.org/10.1177/0899764020918662).
- Bentler, Peter M. 1990. "Comparative Fit Indexes in Structural Models." *Psychological Bulletin* 107 (2):238–46. doi: [10.1037/0033-2909.107.2.238](https://doi.org/10.1037/0033-2909.107.2.238).
- Berrebi, Claude, Ariel Karlinsky, and Hanan Yonah. 2021. "Individual and Community Behavioral Responses to Natural Disasters." *Natural Hazards* 105 (2):1541–69. doi: [10.1007/s11069-020-04365-2](https://doi.org/10.1007/s11069-020-04365-2).
- Bixler, R. Patrick, and David W. Springer. 2018. "Nonprofit Social Capital as an Indicator of a Healthy Nonprofit Sector." *Nonprofit Policy Forum* 9 (3):1–18. doi: [10.1515/npf-2018-0017](https://doi.org/10.1515/npf-2018-0017).
- Bixler, R. Patrick, Euijin Yang, Steven M. Richter, and Marc Coudert. 2021. "Boundary Crossing for Urban Community Resilience: A Social Vulnerability and Multi-Hazard Approach in Austin, Texas, USA." *International Journal of Disaster Risk Reduction* 66:102613. doi: [10.1016/j.ijdrr.2021.102613](https://doi.org/10.1016/j.ijdrr.2021.102613).
- Brown, William. 2017. "Classification of Program Activities: How Nonprofits Create Social Value." *Administrative Sciences* 7 (2):12. doi: [10.3390/admsci7020012](https://doi.org/10.3390/admsci7020012).
- Brudney, Jeffrey L., and Beth Gazley. 2009. "Planning to Be Prepared: An Empirical Examination of the Role of Voluntary Organizations in County Government Emergency Planning." *Public Performance & Management Review* 32 (3):372–99. doi: [10.2753/PMR1530-9576320302](https://doi.org/10.2753/PMR1530-9576320302).
- Bryan, Tara Kolar. 2019. "Toward a Contingency Model for the Relationship between Capacity and Effectiveness in Nonprofit Organizations." *Nonprofit and Voluntary Sector Quarterly* 48 (4):885–97. doi: [10.1177/0899764018815617](https://doi.org/10.1177/0899764018815617).
- Cameron, Kim S. 1986. "Effectiveness as Paradox: Consensus and Conflict in Conceptions of Organizational Effectiveness." *Management Science* 32 (5):539–53. doi: [10.1287/mnsc.32.5.539](https://doi.org/10.1287/mnsc.32.5.539).
- Campbell, David A., and Kristina T. Lambricht. 2016. "Program Performance and Multiple Constituency Theory." *Nonprofit and Voluntary Sector Quarterly* 45 (1):150–71. doi: [10.1177/0899764014564578](https://doi.org/10.1177/0899764014564578).
- Carman, Joanne G. 2011. "Understanding Evaluation in Nonprofit Organizations." *Public Performance & Management Review* 34 (3):350–77. doi: [10.2753/PMR1530-9576340302](https://doi.org/10.2753/PMR1530-9576340302).
- Castañeda, Javiera V., Nicolás C. Bronfman, Pamela C. Cisternas, and Paula B. Repetto. 2020. "Understanding the Culture of Natural Disaster Preparedness: Exploring the Effect of Experience and Sociodemographic Predictors." *Natural Hazards* 103 (2):1881–904. doi: [10.1007/s11069-020-04060-2](https://doi.org/10.1007/s11069-020-04060-2).
- Chapman, Cassandra M., Winnifred R. Louis, Barbara M. Masser, and Emma F. Thomas. 2022. "Charitable Triad Theory: How Donors, Beneficiaries, and Fundraisers Influence Charitable Giving." *Psychology & Marketing* 39 (9):1826–48. doi: [10.1002/mar.21701](https://doi.org/10.1002/mar.21701).
- Clary, E. Gil., and Mark Snyder. 1999. "The Motivations to Volunteer: Theoretical and Practical Considerations." *Current Directions in Psychological Science* 8 (5):156–9. doi: [10.1111/1467-8721.00037](https://doi.org/10.1111/1467-8721.00037).
- Clerkin, Richard M., Laurie E. Paarlberg, Robert K. Christensen, Rebecca A. Nesbit, and Mary Tschirhart. 2013. "Place, Time, and Philanthropy: Exploring Geographic Mobility and Philanthropic Engagement." *Public Administration Review* 73 (1):97–106. doi: [10.1111/j.1540-6210.2012.02616.x](https://doi.org/10.1111/j.1540-6210.2012.02616.x).
- Comfort, Louise K., and Naim Kapucu. 2006. "Inter-Organizational Coordination in Extreme Events: The World Trade Center Attacks, September 11, 2001." *Natural Hazards* 39 (2):309–27. doi: [10.1007/s11069-006-0030-x](https://doi.org/10.1007/s11069-006-0030-x).
- Curnin, Steven, and Danielle O'Hara. 2019. "Nonprofit and Public Sector Interorganizational Collaboration in Disaster Recovery: Lessons from the Field." *Nonprofit Management and Leadership* 30 (2):277–97. doi: [10.1002/nml.21389](https://doi.org/10.1002/nml.21389).
- Domingue, Simone J., and Christopher T. Emrich. 2019. "Social Vulnerability and Procedural Equity: Exploring the Distribution of Disaster Aid across Counties in the United States." *The American Review of Public Administration* 49 (8):897–913. doi: [10.1177/0275074019856122](https://doi.org/10.1177/0275074019856122).
- Ebrahim, Alnoor. 2005. "Accountability Myopia: Losing Sight of Organizational Learning." *Nonprofit and Voluntary Sector Quarterly* 34 (1):56–87. doi: [10.1177/0899764004269430](https://doi.org/10.1177/0899764004269430).

- Ebrahim, Alnoor. 2010. "The Many Faces of Nonprofit Accountability." Pp. 110–21 in *The Handbook of Nonprofit Leadership and Management*. 3rd ed., edited by D. Renz. San Francisco, CA: Jossey-Bass.
- Eikenberry, Angela M., and Jodie Drapal Kluver. 2004. "The Marketization of the Nonprofit Sector: Civil Society at Risk?" *Public Administration Review* 64 (2):132–40. doi: [10.1111/j.1540-6210.2004.00355.x](https://doi.org/10.1111/j.1540-6210.2004.00355.x).
- Fu, Jiawei Sophia, and Katherine R. Cooper. 2021. "Interorganizational Network Portfolios of Nonprofit Organizations: Implications for Collaboration Management." *Nonprofit Management and Leadership* 31 (3):437–59. doi: [10.1002/nml.21438](https://doi.org/10.1002/nml.21438).
- Garson, G. D. 2010. "Reliability Analysis Statnotes: Topics in Multivariate Analysis." Retrieved (<https://faculty.chass.ncsu.edu/garson/pa765/statnote.htm>).
- Gazley, Beth, Brad R. Fulton, Wesley Mlsna Zebrowski, and David P. King. 2022. "Giving and Going: US Congregational Participation in Disaster Response." *Nonprofit Management and Leadership* 33 (1):157–78. doi: [10.1002/nml.21503](https://doi.org/10.1002/nml.21503).
- Grimalda, Gianluca, Nancy R. Buchan, Orgul D. Ozturk, Adriana C. Pinate, Giulia Urso, and Marilyn B. Brewer. 2021. "Exposure to COVID-19 Is Associated with Increased Altruism, Particularly at the Local Level." *Scientific Reports* 11 (1):18950. doi: [10.1038/s41598-021-97234-2](https://doi.org/10.1038/s41598-021-97234-2).
- Guo, Chao, Barbara A. Metelsky, and Patricia Bradshaw. 2014. "Out of the Shadows: Nonprofit Governance Research from Democratic and Critical Perspectives." Pp. 63–84 in *New Perspectives on Nonprofit Governance*, edited by C. J. Cornforth and W. A. Brown. London, UK: Routledge.
- Harrison, Jill Lindsey. 2016. "Bureaucrats' Tacit Understandings and Social Movement Policy Implementation: Unpacking the Deviation of Agency Environmental Justice Programs from EJ Movement Priorities." *Social Problems* 63 (4):534–53. doi: [10.1093/socpro/spw024](https://doi.org/10.1093/socpro/spw024).
- Herman, Robert D., and David O. Renz. 1997. "Multiple Constituencies and the Social Construction of Nonprofit Organization Effectiveness." *Nonprofit and Voluntary Sector Quarterly* 26 (2):185–206. doi: [10.1177/0899764097262006](https://doi.org/10.1177/0899764097262006).
- Herman, Robert D., and David O. Renz. 2008. "Advancing Nonprofit Organizational Effectiveness Research and Theory: Nine Theses." *Nonprofit Management and Leadership* 18 (4):399–415. doi: [10.1002/nml.195](https://doi.org/10.1002/nml.195).
- Hutton, Nicole S., Steven W. Mumford, Marina Saitgalina, Juita-Elena Yusuf, Joshua G. Behr, Rafael Diaz, and John J. Kiefer. 2021. "Nonprofit Capacity to Manage Hurricane-Pandemic Threat: Local and National Perspectives on Resilience during COVID-19." *International Journal of Public Administration* 44 (11–12):984–93. doi: [10.1080/01900692.2021.1922439](https://doi.org/10.1080/01900692.2021.1922439).
- Hwang, Hyunseok, and Donghoo Joo. 2021. "How to Be Resilient? Local Philanthropy as a Collective Response to Natural Disasters." *VOLUNTAS: International Journal of Voluntary and Nonprofit Organizations* 32 (2):430–47. doi: [10.1007/s11266-020-00239-0](https://doi.org/10.1007/s11266-020-00239-0).
- Hwang, Hyunseok, and Young-Joo Lee. 2023. "What Drives Organizational Missions in the Nonprofit Sector?: A Institutional Logic Dependence Perspective." *Journal of Professions and Organization* 10 (1):1–20. doi: [10.1093/jpo/joad002](https://doi.org/10.1093/jpo/joad002).
- Hwang, Hyunseok, Arnold Vedlitz, and R. Patrick Bixler. 2023. "Growing Community Resilience from the Grassroots: Risk Awareness, Confidence in Institutions, and Civic Participation in a Natural Hazards Context." *Natural Hazards Review* 24 (3):04023020. doi: [10.1061/NHREFO.NHENG-1658](https://doi.org/10.1061/NHREFO.NHENG-1658).
- James, Russell N. III, and Deanna L. Sharpe. 2007. "The Nature and Causes of the U-Shaped Charitable Giving Profile." *Nonprofit and Voluntary Sector Quarterly* 36 (2):218–38. doi: [10.1177/0899764006295993](https://doi.org/10.1177/0899764006295993).
- James, Trevor Keith, and Hanna Zagefka. 2017. "The Effects of Group Memberships of Victims and Perpetrators in Humanly Caused Disasters on Charitable Donations to Victims." *Journal of Applied Social Psychology* 47 (8): 446–58. doi: [10.1111/jasp.12452](https://doi.org/10.1111/jasp.12452).
- Jenkins, Pamela, Tara Lambeth, Kim Mosby, and Bethany Van Brown. 2015. "Local Nonprofit Organizations in a Post-Katrina Landscape: Help in a Context of Recovery." *American Behavioral Scientist* 59 (10):1263–77. doi: [10.1177/0002764215591183](https://doi.org/10.1177/0002764215591183).
- Katz, Hagai. 2018. "The Impact of Familiarity and Perceived Trustworthiness and Influence on Donations to Nonprofits: An Unaided Recall Study." *Journal of Nonprofit & Public Sector Marketing* 30 (2):187–99. doi: [10.1080/10495142.2017.1326874](https://doi.org/10.1080/10495142.2017.1326874).
- Kim, Hyunho, Boncho Ku, Jong Yeol Kim, Young-Jae Park, and Young-Bae Park. 2016. "Confirmatory and Exploratory Factor Analysis for Validating the Phlegm Pattern Questionnaire for Healthy Subjects." *Evidence-Based Complementary and Alternative Medicine* 2016:2696019. doi: [10.1155/2016/2696019](https://doi.org/10.1155/2016/2696019).
- Kim, Jungbu, Seong Soo Oh, and Taehyun Jung. 2010. "Funding for Disaster Recovery: Increased Taxes or Charitable Donations to Nonprofits?" *International Journal of Public Administration* 33 (3):151–9. doi: [10.1080/01900690903304167](https://doi.org/10.1080/01900690903304167).
- Kirk, David S. 2009. "A Natural Experiment on Residential Change and Recidivism: Lessons from Hurricane Katrina." *American Sociological Review* 74 (3):484–505. doi: [10.1177/000312240907400308](https://doi.org/10.1177/000312240907400308).
- Kline, Rex B. 2015. *Principles and Practices of Structural Equation Modeling*. New York, NY: Gilford Publications.

- Knowles, Simon R., Melissa K. Hyde, and Katherine M. White. 2012. "Predictors of Young People's Charitable Intentions to Donate Money: An Extended Theory of Planned Behavior Perspective." *Journal of Applied Social Psychology* 42 (9):2096–110. doi: [10.1111/j.1559-1816.2012.00932.x](https://doi.org/10.1111/j.1559-1816.2012.00932.x).
- Konrath, Sara, and Femida Handy. 2018. "The Development and Validation of the Motives to Donate Scale." *Nonprofit and Voluntary Sector Quarterly* 47 (2):347–75. doi: [10.1177/0899764017744894](https://doi.org/10.1177/0899764017744894).
- Lambright, Kristina T. 2008. "Agency Theory and beyond: Contracted Providers' Motivations to Properly Use Service Monitoring Tools." *Journal of Public Administration Research and Theory* 19 (2):207–27. doi: [10.1093/jopart/mun009](https://doi.org/10.1093/jopart/mun009).
- Lee, Jeongyoon, Young Joo Park, and Sung-Eun Kim. 2023. "Volunteers and Resource Management Competencies of Nonprofit Organizations during Challenging Times." *Nonprofit Management and Leadership* 34 (1):107–29. doi: [10.1002/nml.21562](https://doi.org/10.1002/nml.21562).
- Lindell, Michael K. 2013. "Disaster Studies." *Current Sociology* 61 (5–6):797–825. doi: [10.1177/0011392113484456](https://doi.org/10.1177/0011392113484456).
- Liu, Wendy, and Jennifer Aaker. 2008. "The Happiness of Giving: The Time-Ask Effect." *Journal of Consumer Research* 35 (3):543–57. doi: [10.1086/588699](https://doi.org/10.1086/588699).
- Liu, Wenlin, Weiai Xu, and Burton John. 2021. "Organizational Disaster Communication Ecology: Examining Interagency Coordination on Social Media during the Onset of the COVID-19 Pandemic." *American Behavioral Scientist* 65 (7):914–33. doi: [10.1177/0002764221992823](https://doi.org/10.1177/0002764221992823).
- Maki, Alexander, Patrick C. Dwyer, Susanne Blazek, Mark Snyder, Roberto González, and Siugmin Lay. 2019. "Responding to Natural Disasters: Examining Identity and Prosociality in the Context of a Major Earthquake." *The British Journal of Social Psychology* 58 (1):66–87. doi: [10.1111/bjso.12281](https://doi.org/10.1111/bjso.12281).
- Meléndez, José W., and Maria Martinez-Cosio. 2021. "Differentiating Participation: Identifying and Defining Civic Capacities Used by Latino Immigrants in Participatory Budgeting." *City & Community* 20 (3):212–34. doi: [10.1177/1535684121993473](https://doi.org/10.1177/1535684121993473).
- Meyer, Michelle Annette, Lori Peek, N. Prabha Unnithan, Rebekah Coşkun, Jennifer Tobin-Gurley, and Katherine Heriot Hoffer. 2016. "Planning for Diversity: Evaluation of a Volunteer Disaster Response Program." *Journal of Cultural Diversity* 23:106–14.
- Mitchell, Sarah-Louise, and Moira Clark. 2021. "Rethinking Non-Profit Brands through a Volunteer Lens: Time for B2V." *Journal of Marketing Management* 37 (5–6):464–87. doi: [10.1080/0267257X.2020.1818804](https://doi.org/10.1080/0267257X.2020.1818804).
- Mızrak, Sefa, Ahmet Özdemir, and Ramazan Aslan. 2021. "Adaptation of Hurricane Risk Perception Scale to Earthquake Risk Perception and Determining the Factors Affecting Women's Earthquake Risk Perception." *Natural Hazards* 109 (3):2241–59. doi: [10.1007/s11069-021-04918-z](https://doi.org/10.1007/s11069-021-04918-z).
- Ohmer, Mary L. 2010. "How Theory and Research Inform Citizen Participation in Poor Communities: The Ecological Perspective and Theories on Self-and Collective Efficacy and Sense of Community." *Journal of Human Behavior in the Social Environment* 20 (1):1–19. doi: [10.1080/10911350903126999](https://doi.org/10.1080/10911350903126999).
- Osborne, Stephen P. 2018. "From Public Service-Dominant Logic to Public Service Logic: are Public Service Organizations Capable of co-Production and Value co-Creation?" *Public Management Review* 20 (2):225–31. doi: [10.1080/14719037.2017.1350461](https://doi.org/10.1080/14719037.2017.1350461).
- Paarlberg, Laurie E., and Hyunseok Hwang. 2017. "The Heterogeneity of Competitive Forces: The Impact of Competition for Resources on United Way Fundraising." *Nonprofit and Voluntary Sector Quarterly* 46 (5): 897–921. doi: [10.1177/0899764017713874](https://doi.org/10.1177/0899764017713874).
- Paarlberg, Laurie E., and Sheldon Gen. 2009. "Exploring the Determinants of Nonprofit Coproduction of Public Service Delivery: The Case of K-12 Public Education." *The American Review of Public Administration* 39 (4):391–408. doi: [10.1177/0275074008320711](https://doi.org/10.1177/0275074008320711).
- Park, Hyung Sam, and Arnold Vedlitz. 2013. "Climate Hazards and Risk Status: Explaining Climate Risk Assessment, Behavior, and Policy Support." *Sociological Spectrum* 33 (3):219–39. doi: [10.1080/02732173.2013.732900](https://doi.org/10.1080/02732173.2013.732900).
- Paxton, Pamela. 2020. "What Influences Charitable Giving." In *The Nonprofit Sector: A Research Handbook*, edited by Walter W. Powell, and Pamela Bromley. Stanford, CA: Stanford University Press.
- Paynter, Sharon, and Marueen Berner. 2014. "Organizational Capacity of Nonprofit Social Service Agencies." *Journal of Health and Human Services Administration* 37 (1):111–45.
- Pearsall, Hamil, and Joseph Pierce. 2017. "A Spoiled Well (of Data): Addressing the Procedural Injustice of Contemporary Environmental Justice Research through Collaborative Qualitative Data Gathering." *Local Environment* 22 (3):388–92. doi: [10.1080/13549839.2016.1196349](https://doi.org/10.1080/13549839.2016.1196349).
- Perry, Ronald W., Michael K. Lindell, and Kathleen J. Tierney, eds. 2001. *Facing the unexpected: Disaster preparedness and response in the United States*. Joseph Henry Press.
- Phillips, Brenda. 2020. *Disaster Volunteers: Recruiting and Managing People Who Want to Help*. Cambridge, MA: Butterworth-Heinemann.
- Roberts, Fiona, Frank Archer, and Caroline Spencer. 2021. "The Potential Role of Nonprofit Organisations in Building Community Resilience to Disasters in the Context of Victoria, Australia." *International Journal of Disaster Risk Reduction* 65:102530. doi: [10.1016/j.ijdrr.2021.102530](https://doi.org/10.1016/j.ijdrr.2021.102530).

- Sampson, Robert J., Jeffrey D. Morenoff, and Felton Earls. 1999. "Beyond Social Capital: Spatial Dynamics of Collective Efficacy for Children." *American Sociological Review* 64 (5):633–60. doi: [10.2307/2657367](https://doi.org/10.2307/2657367).
- Sandberg, Billie, Erin Elliott, and Shauna Petchel. 2020. "Investigating the Marketization of the Nonprofit Sector: A Comparative Case Study of Two Nonprofit Organizations." *VOLUNTAS: International Journal of Voluntary and Nonprofit Organizations* 31 (3):494–510. doi: [10.1007/s11266-019-00159-8](https://doi.org/10.1007/s11266-019-00159-8).
- Schneider, Jo Anne. 2009. "Organizational Social Capital and Nonprofits." *Nonprofit and Voluntary Sector Quarterly* 38 (4):643–62. doi: [10.1177/0899764009333956](https://doi.org/10.1177/0899764009333956).
- Scolobig, Anna, Bruna De Marchi, and Marco Borga. 2012. "The Missing Link between Flood Risk Awareness and Preparedness: findings from Case Studies in an Alpine Region." *Natural Hazards* 63 (2):499–520. doi: [10.1007/s11069-012-0161-1](https://doi.org/10.1007/s11069-012-0161-1).
- Shi, Dexin, and Alberto Maydeu-Olivares. 2020. "The Effect of Estimation Methods on SEM Fit Indices." *Educational and Psychological Measurement* 80 (3):421–45. doi: [10.1177/0013164419885164](https://doi.org/10.1177/0013164419885164).
- Shughart, William F. 2006. "Katrinanomics: The Politics and Economics of Disaster Relief." *Public Choice* 127 (1–2):31–53. doi: [10.1007/s11127-006-7731-2](https://doi.org/10.1007/s11127-006-7731-2).
- Smith, Joanne R., and Andree McSweeney. 2007. "Charitable Giving: The Effectiveness of a Revised Theory of Planned Behaviour Model in Predicting Donating Intentions and Behaviour." *Journal of Community & Applied Social Psychology* 17 (5):363–86. doi: [10.1002/casp.906](https://doi.org/10.1002/casp.906).
- TDEM. 2023. "Texas State Operations Center." Retrieved (<https://tdem.texas.gov/response/state-operations-center>).
- Teodoro, Manuel P., and Seung-Ho An. 2018. "Citizen-Based Brand Equity: A Model and Experimental Evaluation." *Journal of Public Administration Research and Theory* 28 (3):321–38. doi: [10.1093/jopart/mux044](https://doi.org/10.1093/jopart/mux044).
- Texas VOAD. 2023. "Texas Voluntary Organizations Active in Disaster." Retrieved (<https://www.txvoad.org/>).
- Trumbo, Craig, Michelle A. Meyer, Holly Marlatt, Lori Peek, and Bridget Morrissey. 2014. "An Assessment of Change in Risk Perception and Optimistic Bias for Hurricanes among Gulf Coast Residents." *Risk Analysis* 34 (6):1013–24. doi: [10.1111/risa.12149](https://doi.org/10.1111/risa.12149).
- Vargas, Robert. 2019. "Gangstering Grants: Bringing Power to Collective Efficacy Theory." *City & Community* 18 (1):369–91. doi: [10.1111/cico.12357](https://doi.org/10.1111/cico.12357).
- Wilson, John, and Marc Musick. 1997. "Who Cares? Toward an Integrated Theory of Volunteer Work." *American Sociological Review* 62 (5):694–713. doi: [10.2307/2657355](https://doi.org/10.2307/2657355).
- Yang, Z. Janet. 2016. "Altruism during Ebola: Risk Perception, Issue Salience, Cultural Cognition, and Information Processing." *Risk Analysis* 36 (6):1079–89. doi: [10.1111/risa.12526](https://doi.org/10.1111/risa.12526).
- Zhao, Chunhong. 2018. "Studying Surface Urban Heat Island Phenomenon Using Remote Sensing in Three Metropolitan Areas of Texas, USA." (<https://digital.library.txstate.edu/handle/10877/7411>).