



# The value of thoughts and prayers

Linda Thunström<sup>a,1</sup> and Shiri Noy<sup>b</sup>

<sup>a</sup>Department of Economics, University of Wyoming, Laramie, WY 82071; and <sup>b</sup>Department of Anthropology and Sociology, Denison University, Granville, OH 43023

Edited by Mary C. Waters, Harvard University, Cambridge, MA, and approved August 16, 2019 (received for review May 14, 2019)

**A standard response of both policy makers and private citizens to hardships—from natural disasters to mass shootings—is to offer “thoughts and prayers.” Critics argue that such gestures are meaningless and may obstruct structural reforms intended to mitigate catastrophes. In this study, we elicit the value of receiving thoughts and prayers from strangers following adversity. We find that Christians value thoughts and prayers from religious strangers and priests, while atheists and agnostics are “prayer averse”—willing to pay to avoid receiving prayers. Furthermore, while indifferent to receiving thoughts from other secular people, they negatively value thoughts from Christians.**

intercessory thoughts | intercessory prayers | willingness to pay

Offering “thoughts and prayers” has become a standard response from both US policy makers and the public to major catastrophes—including hurricanes, wildfires, mass shootings, and disease outbreaks. Despite the frequent usage of these gestures on behalf of people experiencing hardship, the value of thoughts and prayers to recipients remains unknown. In the United States, this knowledge vacuum exacerbates public debate about the value of thoughts and prayers. Critics argue that these gestures are meaningless and can reduce material help or structural reforms aimed at mitigating natural and social disasters. However, studies show that people often find emotional comfort in social support (1, 2). Christians frequently seek others’ prayers during difficult times, believing they may have healing powers (3). Less is known about the perceived value of receiving supportive thoughts.

Because there is no market for intercessory thoughts and prayers (i.e., thoughts and prayers conducted on behalf of others), their value cannot be inferred from existing prices. Instead, values may be assessed by willingness to pay (WTP), a measure that captures the net monetary value of perceived costs and benefits (4, 5). Recipients may expect direct benefits (increased health or wealth) or direct costs (reduced material gain) to result from either thoughts or prayers. Recipients may also experience hedonic gains (feelings of hope or closeness to others) or distressing costs (anger, annoyance) from such gestures.

We designed an incentivized experiment to elicit religious and nonreligious Americans’ WTP for intercessory thoughts and prayers. The experiment was carried out shortly following Hurricane Florence (September 2018) and targeted the population in North Carolina, the state most affected by the natural disaster. Participants ( $n = 482$ ) were recruited through Qualtrics and received their standard payment plus an additional \$5 to be used in the experiment. Religious participants identified as Christian and believed in God; nonreligious participants identified as either atheist or agnostic, and denied or were unsure of God’s existence. We excluded those of other religious beliefs at the recruitment stage. Participants were asked whether they were affected by Hurricane Florence, and if so, to categorize and describe their hardship. If they were not affected by Florence, they were asked to categorize and describe another hardship from the previous year. (Around 30% of participants were affected by Florence. They were no different in their WTP from those not affected [ $t$  test:  $t(436) = -1.08$ ,  $P = 0.282$ ; Wilcoxon Mann–Whitney test:  $z(436) = -0.956$ ,  $P = 0.339$ ].) Participants were told that a stranger would receive their description and offer a gesture of support in

response. We applied a between-subjects study design and Christians and nonreligious participants were randomized into 1 of 4 conditions (C1 to C4). They participated in a WTP-elicitation mechanism where they could exchange some or all of their \$5 for supportive thoughts from a Christian stranger (C1), thoughts from an atheist stranger (C2), prayers from a Christian stranger (C3), or prayers from a priest (C4). Hence, participants could receive prayers only from Christians, while thoughts could be received from either Christian or nonreligious strangers.

Our experiment participants were offered thoughts and prayers. We also recruited senders of thoughts and prayers via Amazon Mechanical Turk—except the priest, who was recruited in the first author’s local community. Participants and senders did not interact.

We used an incentivized multiple price list (MPL) to elicit participants’ WTP (6). The MPL entailed 13 choice pairs where participants chose between two alternatives: an intercessory gesture and a monetary gain, or no gesture and a monetary gain. The monetary amount varied across alternatives and choice pairs, ranging from \$0 to \$5. The MPL enabled participants to assign both positive and negative WTP (7). Participants learned the computer would choose one choice pair at random and that their preferred alternative in that choice pair would be implemented, i.e., determine their payment. To prevent altruism from impacting participants’ valuation of thoughts/prayers, they were informed that their choices did not impact senders’ payments.

We chose to elicit WTP with an MPL for its benefits over alternative methods, such as experimental auctions—it is easy to understand and it is easy for participants to see that it is in their best interest to state truthful values (8). The MPL also has drawbacks, however, which we took measures to address. First, it measures participants’ WTP in intervals rather than points. Participants whose WTP fell within certain intervals were assigned the midpoint values of those intervals. Because the end intervals of MPLs have no upper/lower limits (here, end values imply a WTP of \$5 or above, and  $-\$5$  or below), end values must be imputed (7). Our primary analysis uses the most conservative measure of WTP, imputing end values equal to  $-\$5$  and  $\$5$ . Second, MPLs enable participants to state internally inconsistent values. A participant may state that s/he is willing to forgo \$2 to receive prayers, but unwilling to forgo a smaller amount (e.g., \$1). Inconsistent answers can be the result of filling out the survey incorrectly, inattention, or misunderstanding the questions. Our analysis includes all participants whose WTP was internally consistent ( $n = 436/482$ ; C1,  $n = 105$ ; C2,  $n = 103$ ; C3,  $n = 119$ ; C4,  $n = 109$ ).

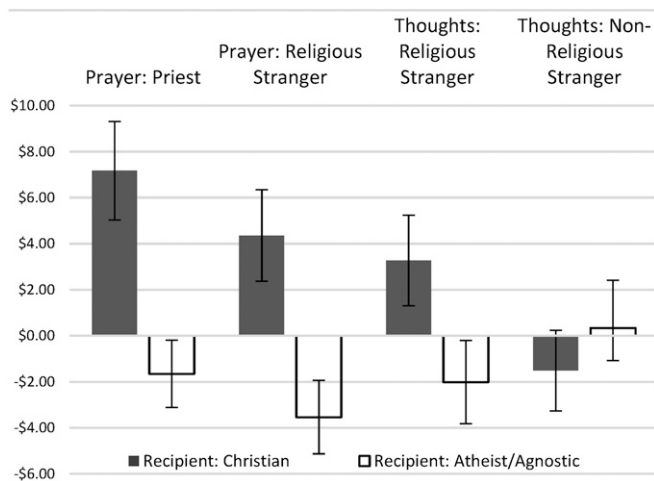
Author contributions: L.T. and S.N. designed research; L.T. performed research; L.T. and S.N. analyzed data; and L.T. and S.N. wrote the paper.

The authors declare no conflict of interest.

This open access article is distributed under [Creative Commons Attribution-NonCommercial-NoDerivatives License 4.0 \(CC BY-NC-ND\)](https://creativecommons.org/licenses/by-nc-nd/4.0/).

Data deposition: A supplementary appendix with experimental instructions, data details, and robustness checks, as well as the data and code reported in this paper, have been deposited in openICPSR, <http://doi.org/10.3886/E111710>.

<sup>1</sup>To whom correspondence may be addressed. Email: [lthunstr@uwyo.edu](mailto:lthunstr@uwyo.edu).



**Fig. 1.** The value of thoughts and prayers from different senders (95% confidence intervals displayed;  $n = 436$ ).

Informed consent was obtained from participants and senders. This study was approved by the University of Wyoming (#20180921LT02114) and Denison University (FA18 #10) institutional review boards.

### Results

The WTP data show spikes around the end values of the distribution ( $-\$5$  or  $\$5$ ). Using a Tobit model to regress WTP on the experimental conditions, we generated predicted values of thoughts and prayers, accounting for upper and lower limit censoring. Fig. 1 shows mean predicted values across conditions.

Fig. 1 suggests that, on average, Christians value prayers from a priest at  $\$7.17$  ( $SE = 1.09$ ) and prayers from a Christian stranger at  $\$4.36$  ( $SE = 1.01$ ). These values are significantly different from zero ( $z = 6.56$ ,  $P < 0.001$  for prayers from a priest, and  $z = 4.30$ ,  $P < 0.001$  for prayers from a stranger). In contrast, the nonreligious are “prayer averse”: on average, they are willing to pay  $\$3.54$  ( $SE = 0.81$ ) for a Christian stranger not to pray for them ( $z = -4.34$ ,  $P < 0.001$ ). Likewise, they are willing to pay a priest  $\$1.66$  ( $SE = 0.75$ ) not to pray for them ( $z = -2.22$ ,  $P = 0.027$ ). The value of intercessory gestures may be affected by in-group bias—Christians value thoughts from a Christian stranger (mean =  $\$3.27$ ,  $SE = 1.00$ ;  $z = 3.27$ ,  $P = 0.001$ ), while nonreligious people negatively value the same gestures (mean =  $-\$2.02$ ,  $SE = 0.92$ ;  $z = -1.19$ ,  $P = 0.029$ ). On the other hand, Christians may negatively value thoughts from a nonreligious stranger: Their mean WTP is  $-\$1.52$  ( $SE = 0.89$ ), which is weakly statistically different from zero ( $z = -1.70$ ,  $P = 0.089$ ). Nonreligious people are indifferent to thoughts from a secular stranger (mean =  $\$0.33$ ,  $SE = 0.72$ ;  $z = 0.46$ ,  $P = 0.643$ ).

Our findings are robust to alternative empirical methods. In addition to the predicted values from the Tobit regression, we calculated WTP across conditions based on the raw data, varying assumptions for the end values. If we handle censoring by

assuming a conditional triangular distribution for the end values (7), results are robust and values similar to those in Fig. 1. If we do not account for censoring and use the most conservative WTP measure (end values equal to  $\$5$  and  $-\$5$ ), our conclusions remain unchanged although the absolute mean values are lower than in Fig. 1. Furthermore, results are supported by non-parametric Wilcoxon Mann–Whitney tests and the values in Fig. 1 are robust to the inclusion of demographic characteristics in the Tobit regression.

The polarization we find across religious lines in how people value thoughts and prayers can be explained by expected benefits from these gestures. Participants were asked to indicate their level of agreement with statements about the helpfulness of intercessory thoughts and prayers (e.g., “I may sometimes be more helped by others’ prayers for me than their material help”). We created an expected benefits index (EBI) based on their answers ( $n = 482$ ; mean = 25.69,  $SD = 11.01$ ). On average, Christians agreed with each statement underlying the EBI, while non-religious participants disagreed. Mediation analysis (9) suggests that the EBI explains the heterogeneity in WTP for thoughts and prayers. Specifically, ordinary least-squares regression models suggest that the EBI value of nonreligious participants is more than 15 units lower than that of religious participants ( $b = -15.48$ ,  $SE = 0.87$ ;  $P < 0.001$ ;  $n = 436$ ), that EBI positively affects WTP ( $b = 0.18$ ,  $SE = 0.02$ ;  $P < 0.001$ ;  $n = 436$ ), and that religion is not a significant predictor of WTP ( $b = 0.40$ ,  $SE = 0.56$ ;  $P = 0.475$ ;  $n = 436$ ) after controlling for the mediating effect of EBI and demographic characteristics. Experimental instructions, robustness checks, data, and Stata code are available in openICPSR (10).

### Discussion

Our results suggest that thoughts and prayers for others should be employed selectively. While Christians value such gestures from fellow believers, nonreligious people negatively value such gestures from Christians and are indifferent to receiving them from other nonreligious people.

Our study sheds empirical light on the value of thoughts and prayers. Several questions warrant future exploration. First, our study purposefully isolates the value of intercessory thoughts and prayers. In other contexts, these gestures may generate important additional (external) effects, e.g., increase or reduce accompanying material help. Second, WTP should, by design, reflect recipients’ true net value of thoughts and prayers. However, people may have biased beliefs about their benefits and costs, e.g., expect intercessory prayers to improve physical health where no such beneficial effects exist (3). Studies might examine the prevalence of biased beliefs and their consequence to public support for material aid and structural reforms intended to mitigate hardships. Finally, research might extend our analysis to religious groups beyond those included in this study.

**ACKNOWLEDGMENTS.** We thank Patricia A. McManus, Landon Schnabel, and Klaas van ‘t Veld for helpful comments. We thank the College of Business’s Research Excellence Fund at University of Wyoming for funding.

1. S. Cohen, H. M. Hoberman, Positive events and social supports as buffers of life change stress. *J. Appl. Soc. Psychol.* **13**, 99–125 (1983).
2. W. Stroebe, E. Zech, M. S. Stroebe, G. Abakoumkin, Does social support help in bereavement? *J. Soc. Clin. Psychol.* **24**, 1030–1050 (2005).
3. K. S. Masters, G. I. Spielman, J. T. Goodson, Are there demonstrable effects of distant intercessory prayer? A meta-analytic review. *Ann. Behav. Med.* **32**, 21–26 (2006).
4. W. K. Viscusi, *Pricing Lives* (Princeton University Press, 2018).
5. C. R. Sunstein, Ruining popcorn? The welfare effects of information. *J. Risk Uncertain.* **58**, 121–142 (2019).
6. D. Kahneman, J. L. Knetsch, R. H. Thaler, Experimental tests of the endowment effect and the coase theorem. *J. Polit. Econ.* **98**, 1325–1348 (1990).
7. H. Allcott, J. B. Kessler, The welfare effects of nudges: A case study of energy use social comparisons. *Am. Econ. J. Appl. Econ.* **11**, 236–276 (2019).
8. S. Anderson, G. W. Harrison, M. I. Lau, E. E. Rutstrom, Valuation using multiple price list formats. *Appl. Econ.* **39**, 675–682 (2007).
9. R. M. Baron, D. A. Kenny, The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *J. Pers. Soc. Psychol.* **51**, 1173–1182 (1986).
10. L. Thunström, S. Noy, The value of thoughts and prayers. openICPSR. <http://doi.org/10.3886/E111710>. Deposited 6 September 2019.