### **Online Appendix**

Number of observations		278
Sex (female)	%	19.78
Age		36.50
Education		
High school or less	%	19.93
Some college	%	16.67
University or above	%	63.41
Married	%	57.55
With children	%	45.68
Occupation		
Full time	%	75.54
Part time	%	5.04
Student	%	7.19
Housewife	%	6.47
Others	%	5.76
Years of residence		16.09

### OA1. Demographic information (Study 1)

To explore potential treatment effect heterogeneity, comparisons of the number of voice calls per person before and after the Great East Japan Earthquake were made between men and women, those under 35 (the median age) and those 35 or above, those who have university degrees and those who do not, married and single people, those with children and those without, and those in fulltime employment and others. None of these subgroup analyses indicated substantial deviation from the results reported in the main paper; the number of voice calls made after the earthquake was substantially greater that beforehand, suggesting that the effect was homogeneous across the different subgroups.

# Table OA1.

### **OA2.** Exploratory Statistical Tests for RQ1

As described in the main manuscript, it is not possible to identify the precise number of participants who continued to use the application during the six days following the earthquake because it is unknown when they uninstalled it. However, we conducted exploratory statistical analyses by imposing some assumptions to fix the sample size during these six days. We fixed the post-earthquake sample size by defining participants in three different ways: 1) those who had any logged mobile communication activity from March 11 to 16 (n = 276), 2) those who had any logged mobile communication activity after March 16 (n = 289), and 3) those who had any logged mobile communication activity after March 11 (n = 295). By identifying the post-earthquake participants by using these three different definitions, the average numbers of mobile voice calls per day before and after the earthquake were compared with paired *t*-tests (Table OA2). Table OA2 demonstrates that, regardless of the definition, the average number of mobile voice calls during six days after the earthquake is significantly larger than that during the five weeks before it, which is consistent with the conclusion concerning RQ1 that the number of mobile voice calls increased after the earthquake.

#### Table OA2.

#### Average number of mobile voice calls Definition of the post-earthquake sample Pre-earthquake Post-earthquake Paired t-test 1) Any logged activity from March 11 to 16 2.29 $t(256) = -4.09 \quad p < 0.001$ 1.80 2) Any logged activity after March 16 1.80 2.24 $t(261) = -3.57 \quad p < 0.001$ 3) Any logged activity after march 11 1.78 2.21 $t(266) = -3.57 \quad p < 0.001$

# Exploratory statistical tests of RQ1

#### OA3. Robustness Check of RQ1b

Contacts were defined as "close ties" if at least one of the responses to the nine items in the first wave that measured the relationships with the participants was positive. By this definition, 55% of calls were placed to close ties. However, this operational definition is admittedly arbitrary. Therefore, we checked the robustness of the results reported in the main manuscript by changing the definition of close ties. Specifically, contacts were defined as "close ties" if a) at least five or b) nine (i.e., all) of the responses to the nine items were positive. Figure OA1 illustrates the rate of increase in the number of voice calls placed to close ties and non-close ties. Figure OA2 illustrates the rate based on definition b), by which 8% of calls were placed to close ties. Despite the large differences between the two alternative definitions in terms of the ratio of calls placed to close ties, Figures OA1 and OA2 closely resemble Figure 3 in the main manuscript. That is, the increased rate of calls to close ties consistently surpassed the rate of calls to non-close ties.



*Figure OA1*. Rate of increase in the number of voice calls placed to close ties and non-close ties after the earthquake. Contacts were defined as "close ties" if at least five of the responses to the nine items were positive. *Solid line:* Close ties. *Dashed line:* Non-close ties. *Note:* The star symbol indicates March 11, the day of the earthquake.



*Figure OA2*. Rate of increase in the number of voice calls placed to close ties and non-close ties after the earthquake. Contacts were defined as "close ties" if all of the nine items were positive. *Solid line:* Close ties. *Dashed line:* Non-close ties.

Note: The star symbol indicates March 11, the day of the earthquake.

We also conducted an exploratory factor analysis using the maximum likelihood method to identify the items that clearly represent the concept of closeness. The results clearly indicated a single factor structure (the eigenvalue was 6.0; 63.2% of the variance was explained). We selected the three items with the largest factor loadings; "Do you and she/he sometimes discuss important issues?"; "Do you trust her/him?"; "Do you and she/he sometimes spend leisure time together?", and contacts were defined as "close ties" if c) at least one or d) all of the responses to the three items were positive. Figure OA3 illustrates the rate of increase in the number of voice calls placed to close ties and non-close ties. Figure OA4 illustrates the rate based on definition d), by which 36% of calls were placed to close ties is greater than that to non-close ties, suggesting the robustness of our finding against the different definitions of "close ties".



*Figure OA3*. Rate of increase in the number of voice calls placed to close ties and non-close ties after the earthquake. Contacts were defined as "close ties" if at least one of the responses to the three items with the largest factor loadings were positive. *Solid line:* Close ties. *Dashed line:* Non-close ties.

Note: The star symbol indicates March 11, the day of the earthquake.



*Figure OA4*. Rate of increase in the number of voice calls placed to close ties and non-close ties after the earthquake. Contacts were defined as "close ties" if all of the responses to the three items with the largest factor loadings were positive. *Solid line:* Close ties. *Dashed line:* Non-close ties.

Note: The star symbol indicates March 11, the day of the earthquake.

### OA4. Procedure for Study 2

The research proposal for Study 2 was reviewed by the Institutional Review Board of the authors' former institution and approved on 25 October 2013. The schedule for Study 2 and the number of responses are shown below. The survey was also distributed to people who did not install the application. Figure OA5 shows the survey schedule and the number of participants at each stage.

Screening study: January 7 to 14, 2014.

Pretreatment survey: January 17 to 27, 2014.

Intermediate survey (priming): February 24 to March 7, 2014.

Posttreatment survey: March 14 to 25, 2014.



Figure OA5. Number of participants at each stage of the Study 2 protocol.

### OA5. Pilot Study for Study 2

We fielded a pilot study to ensure that disaster priming would reproduce the psychological state experienced during the Great East Japan Earthquake and increase mortality salience (MS). Schimel, Hayes, Williams, and Jahrig (2007) used a lexical decision task to verify that those who underwent priming experienced increased MS. Lexical decision tasks require the respondent to determine whether strings of characters displayed on a screen are real words and measure their response time. Respondents indicate whether the characters are words as quickly as possible by pressing a key. The stimuli consist of four types of character strings, presented in random order: i.e., random character strings, negative words, words related to death, and neutral words. Schimel et al. (2007) showed that the MS group had significantly shorter mean response times to the death-related words than to the three other types of character strings. This result indicates that the MS stimulus did not increase the accessibility of negativity in general, but that it specifically activated concepts related to death.

Employing the lexical decision task of Schimel et al. (2007) in our pilot study, we validated the finding that the disaster priming increased MS. We compared reaction times with negative words (e.g., despair and contempt), words related to death (e.g., coffin and grave), and neutral words (e.g., book and seal) for 51 student participants who were randomly assigned to the Disaster group, the standard MS group, or the Control group (n = 16, 18, and 17, respectively). We excluded five participants from our analysis whose error rate was 15% or more, as well as two participants from the Disaster group who did not provide open-ended responses. Following Schimel et al. (2007), we eliminated the responses that took 2,000 ms or more, as well as the responses of those whose within-participant mean response time was three standard deviations or more off the grand mean. A (one-tailed) planned comparison indicated that the response times to words associated with death were shorter than those for

other words in the Disaster and MS groups (t(11) = 1.619, p < 0.07, Cohen's d = 0.224; t(17) = 1.808, p < 0.05, Cohen's d = 0.276, respectively). This result indicates that the disaster priming used in Study 2 enhances MS in the same way that conventional MS priming does.

## OA6. Covariate Balance of Study 2

The mean values of the pretreatment variables that are significantly correlated with the dependent variables in Tables 1 and 2 in the main manuscript were compared between the three experimental conditions. As shown in Table OA3, no significant imbalance was observed among those who completed the entire experiment, suggesting that the random assignment was not impaired despite notable attrition during the experiment.

# Table OA3.

### *Covariate balance of Study 2*

	]	Mean value	e	
	Control group	MS priming	Disaster priming	ANOVA $p$ -value
Gender (% female)	0.59	0.61	0.59	0.77
Age	40.02	38.19	38.64	0.15
Years of residence	17.89	18.14	18.02	0.98
Educational level	4.25	4.31	4.29	0.83
Number of outgoing calls using messaging applications per day	0.41	0.42	0.40	0.79
Number of incoming calls using messaging applications per day	0.41	0.42	0.39	0.80
Number of outgoing calls per day	1.06	0.85	0.93	0.15
Number of incoming calls per day	1.02	0.94	0.97	0.84
Number of email addresses registered	96.71	106.54	113.34	0.26
Number of outgoing calls before the priming (log data)	19.69	22.44	24.55	0.11
Number of incoming calls before the priming (log data)	13.92	13.81	16.77	0.13

*Note* : N = 838, All the covariates are self-report unless otherwise stated.

		MS group	Disaster group	Control group
Number of observations		218	422	198
Sex (female)	%	59.09	58.53	61.47
Age		38.19	38.64	40.02
Education				
Highshool or less	%	24.24	26.30	28.44
Some college	%	25.76	23.93	21.56
University of above	%	48.99	49.29	49.08
Years of residence		18.14	18.02	17.89

# OA7. Demographic information (Study 2)

To explore the potential treatment effect, heterogeneity, moderation by sex, age, education, and years of residence were tested by adding the interaction terms to the models reported in Table 1 in the main paper. None of these interaction terms showed consistent significant effects, indicating that the treatment effects found in Study 2 were homogeneous across different subgroups.

# Table OA4.

### OA8. Robustness Check of H1a and H2a

To check the robustness of the results against the different operationalization of "close ties," we re-estimated the models in Table 2 by defining contacts as "close ties" if a) at least two, b) at least three, or c) at least four of the responses to the nine items were positive. We tested these three operationalizations because when contacts are defined as "close ties," if at least five or more of the responses were positive, the number of participants who made calls to at least one close tie after priming become too small and the estimation become unstable. More specifically, the ratio of participants who made calls to at least one close tie after priming was 2.63% (24 hours), 4.77% (48 hours), and 6.44% (72 hours) when contacts are defined as "close ties" if at least five of the responses were positive.

Tables OA5a, OA5b, and OA5c present the results of the robustness check for the results of Table 2 in the main manuscript. The results are by and large consistent with those of Table 2; i.e., disaster and MS priming promote calls to close ties but not to non-close ties. Although those in the MS condition were more likely than those in the control group to make calls only to non-close ties 48 hours after priming, the effect of disaster priming on calls to non-close ties was consistently insignificant throughout the three different operationalizations of "close ties." We acknowledge that in Table OA5c, the disaster priming shows a significant effect on the calls to close ties only when the time window is 72 hours. However, the effects are all positive as expected, and the point estimate of the effect after 24 hours (0.724) is even larger than the one reported in Table 2 (0.665), indicating that the insignificant results are attributable to the small number of those who made calls to at least one close tie and the consequential large standard errors. In summary, the results of Table 2 are robust against the different operationalizations of "close ties."

# Table OA5a.

Re-estimation of Table2: Contacts were defined as "close ties" if at least two of the nine

## items were positive

	Calls we	ere made to at l	least one	Call	Calls were made only to			
	clos	e tie after prin	ning	noncl	nonclose ties after priming			
	24 hours	48 hours	72 hours	24 hours	48 hours	72 hours		
MS condition	0.436	0.599*	0.400	0.402	0.428*	0.355		
	(0.408)	(0.310)	(0.285)	(0.275)	(0.235)	(0.219)		
Disaster condition	0.756**	0.507*	0.484**	-0.037	0.091	0.005		
	(0.339)	(0.271)	(0.244)	(0.246)	(0.208)	(0.192)		
Number of calls before the priming	0.020***	0.025***	0.029***	0.025***	0.020***	0.014***		
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)		
Constant	-3.420***	-2.856***	-2.582***	-2.411***	-1.774***	-1.340***		
	(0.334)	(0.262)	(0.235)	(0.226)	(0.189)	(0.171)		
Observations	838	838	838	838	838	838		
Log Likelihood	-235.5	-319.6	-363.1	-340.2	-441.7	-488.5		
Pseudo R2	0.08	0.09	0.12	0.09	0.05	0.03		

*Note* : \*\*\* p < .01, \*\* p < .05, \* p < .1. The baseline category is the control group.

# Table OA5b.

Re-estimation of Table2: Contacts were defined as "close ties" if at least three of the nine

### items were positive

	Calls we	ere made to at l	least one	Calls	Calls were made only to nonclose ties after priming			
	clos	se tie after prin	ning	noncl				
	24 hours	48 hours	72 hours	24 hours	48 hours	72 hours		
MS condition	0.466	0.516	0.597*	0.401	0.492**	0.279		
	(0.454)	(0.331)	(0.314)	(0.269)	(0.233)	(0.215)		
Disaster condition	0.738*	0.413	0.666**	0.049	0.167	-0.046		
	(0.380)	(0.289)	(0.271)	(0.238)	(0.205)	(0.187)		
Number of calls before the priming	0.018***	0.020***	0.023***	0.027***	0.025***	0.021***		
	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)		
Constant	-3.654***	-2.923***	-2.860***	-2.363***	-1.802***	-1.260***		
	(0.373)	(0.275)	(0.264)	(0.221)	(0.189)	(0.167)		
Observations	838	838	838	838	838	838		
Log Likelihood	-199.4	-285.5	-328.1	-359.8	-454.0	-501.9		
Pseudo R2	0.07	0.07	0.09	0.10	0.08	0.05		

*Note*: \*\*\* p < .01, \*\* p < .05, \* p < .1. The baseline category is the control group.

### Table OA5c.

Re-estimation of Table2: Contacts were defined as "close ties" if at least four of the nine

### items were positive

	Calls we	ere made to at l	east one	Calls	Calls were made only to			
	clos	e tie after prin	ning	noncle	nonclose ties after priming			
	24 hours	48 hours	72 hours	24 hours	48 hours	72 hours		
MS condition	0.645	0.505	0.708**	0.366	0.520**	0.287		
	(0.517)	(0.372)	(0.360)	(0.265)	(0.230)	(0.212)		
Disaster condition	0.724	0.334	0.713**	0.123	0.221	0.009		
	(0.446)	(0.326)	(0.314)	(0.232)	(0.202)	(0.185)		
Number of calls before the priming	0.017***	0.018***	0.022***	0.030***	0.031***	0.025***		
	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)		
Constant	-4.000***	-3.161***	-3.256***	-2.318***	-1.796***	-1.204***		
	(0.437)	(0.308)	(0.308)	(0.217)	(0.188)	(0.166)		
Observations	838	838	838	838	838	838		
Log Likelihood	-159.9	-234.8	-271.3	-375.7	-463.8	-512.8		
Pseudo R2	0.06	0.05	0.08	0.11	0.10	0.07		

*Note* : \*\*\* p < .01, \*\* p < .05, \* p < .1. The baseline category is the control group.

Furthermore, following the robustness check in OA3, we selected the three items that have the largest factor loadings in Study 1; "Do you and she/he sometimes discuss important issues?"; "Do you trust her/him?"; "Do you and she/he sometimes spend leisure time together?", and contacts were defined as "close ties" if all the responses to these three items were positive. The models in Table 2 were re-estimated based on this definition (Table OA5d). Disaster and MS priming consistently showed a higher likelihood of making calls to at least one close tie compared with the control group, with only one exception: the effect of disaster priming 48 hours after the priming. By contrast, disaster and MS priming consistently showed insignificant effects on the likelihood of making calls only to non-close ties, with only one exception: the effect of MS priming 48 hours after the results are robust against the different operationalization of "close ties."

# Table OA5d.

Re-estimation of Table 2: Contacts were defined as "close ties" if the three items with the

	Calls w	vere made to at le	east one	Call	Calls were made only to			
	clo	ose tie after prim	ing	nonc	nonclose ties after priming			
	24 hours	48 hours	72 hours	24 hours	48 hours	72 hours		
MS condition	1.131**	0.729*	0.819**	0.260	0.435*	0.236		
	(0.568)	(0.376)	(0.352)	(0.262)	(0.229)	(0.212)		
Disaster condition	1.098**	0.453	0.723**	0.051	0.185	0.008		
	(0.510)	(0.336)	(0.311)	(0.229)	(0.200)	(0.183)		
Number of calls before the priming	0.018***	0.020***	0.024***	0.029***	0.028***	0.022***		
	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)		
Constant	-4.411***	-3.326***	-3.290***	-2.239***	-1.715***	-1.157***		
	(0.511)	(0.323)	(0.306)	(0.212)	(0.184)	(0.164)		
Observations	838	838	838	838	838	838		
LogLikelihood	-155.0	-235.3	-279.0	-377.9	-468.2	-516.5		
Pseudo R2	0.07	0.07	0.10	0.11	0.09	0.06		

largest factor loadings were positive

*Note* : \*\*\* p < .01, \*\* p < .05, \* p < .1. The baseline category is the control group.

### OA9. Placebo Tests for Study 2

We ran several placebo tests to ensure that the increases in number of voice calls to close ties in Study 2 were due to increases in MS. In the intermediate survey, the participants responded to self-report questions immediately after the priming. Among these were two questions about the conscious motivation to contact close ties. These items were embedded in a name generator battery in which the participants reported their relationships with their own specific close ties. In the pretreatment survey, the participants named up to three close ties by reporting unidentifiable nicknames. These nicknames were carried over to the intermediary survey and presented in the name generator battery. Specifically, two items measured motivation to contact the close ties: "Do you want to be able to contact [nickname] anytime and anywhere, regardless of whether you actually contact him or not?" and "How happy would you be if [nickname] just called you?" These two items were measured with a four-point scale ranging from 1 to 4, with larger values indicating stronger motivation to contact the close ties. Note that these self-report measures tap the conscious motivation to contact specific close ties. If the MS and the disaster priming increased the number of outgoing voice calls for reasons such as a conscious need for social support, the treatments should have positive effects on these measurements.

With these variables as the placebo-dependent variables, the treatment effects were estimated in the same way as Table 1 in the main paper (Table OA6). Models 1 to 4 analyzed the two measurements separately, while the dependent variable in Models 5 and 6 was the average of the two measurements. The correlation between the two measurements was 0.529 (p < .01). Models 1, 3, and 5 took the average of the responses of three close ties per participant, making the participants the unit of analysis. On the other hand, Models 2, 4, and 6 analyzed the treatment effects at the tie level (i.e., the data were transformed to long format). All models in Table OA6 show null treatment effects, except the positive effect of MS

priming in Model 4. That is, neither MS nor disaster priming consistently increased motivation to contact close ties *at the conscious level*, even immediately after priming. These placebo tests lend more credence to the conclusion that the increases in voice calls to close ties in Study 2 were not due to a conscious motivation to contact close ties, but to increases in MS.

# Table OA6.

Dependent variable: Motivation to contact close ties	Do you want to be able to contact the close tie anytime and anywhere?		How happy would you be if the close tie just called you?		Average	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
MS condition	0.061	0.028	0.111	0.096*	0.086	0.062
	(0.067)	(0.047)	(0.081)	(0.053)	(0.065)	(0.043)
Disaster condition	0.019	0.003	0.044	0.037	0.031	0.020
	(0.057)	(0.038)	(0.069)	(0.046)	(0.055)	(0.037)
The number of calls before the priming	0.004***	0.004***	0.005***	0.005***	0.004***	0.004***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)
Constant	3.240***	3.267***	2.789***	2.800***	3.014***	3.034***
	(0.050)	(0.034)	(0.060)	(0.040)	(0.048)	(0.032)
Observations	838	2,420	838	2,420	838	2,420
Groups	-	838	-	838	-	838
R-squared	0.024	0.018	0.027	0.021	0.033	0.025
Adj. R-squared	0.021	0.017	0.023	0.019	0.030	0.024

Placebo tests to predict conscious motivation to contact close ties

*Note:* \*\*\* p < .01, \*\* p < .05, \* p < .1. The baseline category is the control group.

Standard errors in parentheses for Model 1, 3, and 5. Robust standard errors in parentheses for Model 2, 4, and 6.

# References

Schimel, J., Hayes, J., Williams, T., & Jahrig, J. (2007). Is death really the worm at the core? Converging evidence that worldview threat increases death-thought accessibility. *Journal of Personality and Social Psychology*, 92, 789–803. doi:10.1037/0022-3514.92.5.789