

# Climate Change and Disasters

论文复现

王敏杰

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## Climate Change and Disasters: How Framing Affects Justifications for Giving or Withholding Aid to Disaster Victims

[Daniel A. Chapman](#) and [Brian Lickel](#) [View all authors and affiliations](#)

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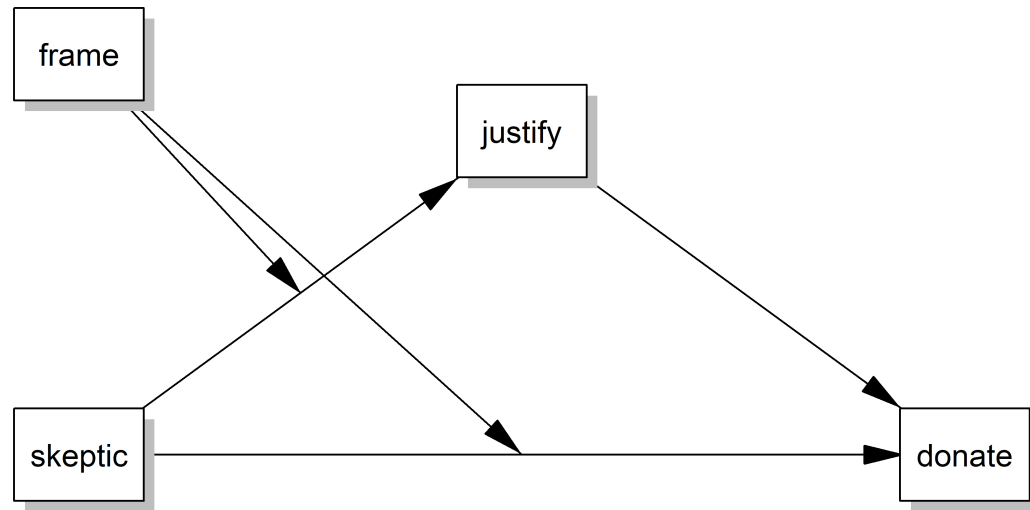
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# 论文架构图



**复现开始**

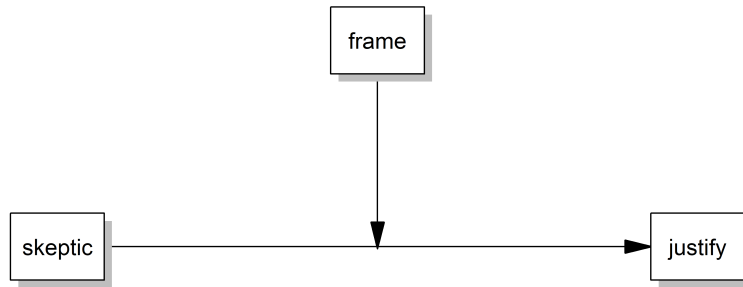
# 数据

```
library(tidyverse)

d <- readr::read_csv("./data/disaster.csv")
d
```

id	frame	donate	justify	skeptic
1	1	5.6	2.95	1.8
2	1	4.2	2.85	5.2
3	1	4.2	3.00	3.2
4	1	4.6	3.30	1.0
5	1	3.0	5.00	7.6
6	0	5.0	3.20	4.2
7	0	4.8	2.90	4.2

# The Impact of Disaster Framing on Donation Justifications

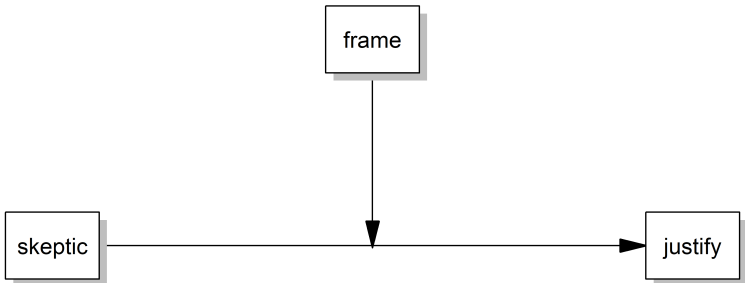


```
library(modelsummary)

dc <- d %>%
  mutate(across(c(skeptic), ~ .x - mean(.x))) %>%
  mutate(frame = as.factor(frame))

mod1 <- lm(justify ~ skeptic, data = dc)
mod2 <- lm(justify ~ skeptic + frame + frame:skeptic, data = dc)
```

# The Impact of Disaster Framing on Donation Justifications



```
library(modelsummary)

dc <- d %>%
  mutate(across(c(skeptical), ~ .x - mean(.x))) %>%
  mutate(frame = as.factor(frame))

mod1 <- lm(justify ~ skeptical, data = dc)
mod2 <- lm(justify ~ skeptical + frame + frame:skeptical, data = dc)
```

	mod1				mod2			
	Est.	2.5 %	97.5 %	p	Est.	2.5 %	97.5 %	p
skeptical	0.201***	0.145	0.257	0.000	0.105**	0.030	0.180	0.006
frame1					0.117	-0.104	0.338	0.297
skeptical × frame1					0.201***	0.092	0.310	0.000
Num.Obs.	211				211			
R2	0.194				0.246			
R2 Adj.	0.190				0.235			
AIC	527.5				517.4			
BIC	537.6				534.1			
Log.Lik.	-260.755				-253.680			
F	50.299				22.543			
RMSE	0.83				0.81			



# The Impact of Disaster Framing on Donation Justifications

victim blaming, and perceived self-help). Combining these five scales together formed a reliable composite ( $M = 2.87$ ,  $SD = 0.93$ ,  $\alpha = .76$ ), with higher scores indicating greater justifications for withholding donations.

However, to provide a thorough examination of this second-order motivated reasoning prediction, we also tested for the interaction between climate change skepticism and condition on each of the justification measures individually (see Table 2). Consistent with our hypothesis, in each case, we observed the predicted interaction pattern between climate change skepticism and disaster framing that mirrors the results of the full justifications composite.

When examining the full composite, there was a significant interaction between climate change skepticism and condition (controlling for political ideology) on justifications to withhold aid, consistent with our predictions ( $b = .20$ ,  $SE_b = 0.06$ ,  $t = 3.62$ ,  $p < .001$ , 95% CI = [0.092, 0.310]).<sup>1</sup> In the climate change condition, climate change skepticism strongly predicted greater justifications for withholding aid ( $b = .30$ ,  $SE_b = 0.04$ ,  $t = 6.84$ ,  $p < .001$ , 95% CI = [0.214, 0.388]). Skepticism also predicted greater justifications to withhold aid in the control condition, although to a lesser extent ( $b = .10$ ,  $SE_b = 0.04$ ,  $t = 2.35$ ,  $p = .02$ , 95% CI = [0.016, 0.184]). Figure 1 displays the interaction between skepticism and framing condition on the donation justifications composite.

```
library(modelsummary)

dc <- d %>%
  mutate(across(c(skeptic), ~ .x - mean(.x))) %>%
  mutate(frame = as.factor(frame))

mod1 <- lm(justify ~ skeptic, data = dc)
mod2 <- lm(justify ~ skeptic + frame + frame:skeptic, data = dc)
```

	mod1				mod2			
	Est.	2.5 %	97.5 %	p	Est.	2.5 %	97.5 %	p
skeptic	0.201***	0.145	0.257	0.000	0.105**	0.030	0.180	0.006
frame1					0.117	-0.104	0.338	0.297
skeptic × frame1					0.201***	0.092	0.310	0.000
Num.Obs.	211				211			
R2	0.194				0.246			
R2 Adj.	0.190				0.235			
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```
library(marginaleffects)

mod2 %>%
  marginaleffects::slopes(
    variables = "skeptical",
    newdata = datagrid(frame = c(0, 1))
  ) %>%
  as_tibble()
```

rowid	term	estimate	std.error	statistic	p.value	conf.low	conf.high
1	skeptical	0.105	0.038	2.755	0.006	0.030	0.180
2	skeptical	0.306	0.040	7.655	0.000	0.228	0.385

# The Impact of Disaster Framing on Donation Justifications

As predicted, there was a significant effect for those high in skepticism when comparing the climate change condition and the control condition, with skeptics (+1 *SD* on skepticism) exhibiting more negative donation justification attitudes in the climate change condition ( $M = 3.54$ ) than in the control condition ( $M = 3.02$ ;  $b = .52$ ,  $SE_b = 0.16$ ,  $t = 3.27$ ,  $p = .001$ , 95% CI = [0.207, 0.835]). There was also a marginal effect for those low in skepticism ( $-1$  *SD*) in the opposite direction such that non-skeptics exhibited less negative justifications in the climate change condition ( $M = 2.31$ ) than in the control condition ( $M = 2.61$ ;  $b = -.30$ ,  $SE_b = 0.16$ ,  $t = -1.87$ ,  $p = .063$ , 95% CI = [-0.613, 0.017]).

```
library(marginaleffects)

mod2 %>%
  marginaleffects::predictions(
    newdata = datagrid(
      frame = unique,
      skeptic = function(x) c(sd(x), -sd(x))
    ) %>%
    as_tibble()
```

rowid	estimate	std.error	statistic	p.value	conf.low	conf.high
4	2.593	0.109	23.884	0.000	2.380	2.806
3	3.020	0.111	27.286	0.000	2.803	3.237
2	2.301	0.116	19.848	0.000	2.074	2.528
1	3.546	0.114	31.244	0.000	3.324	3.769

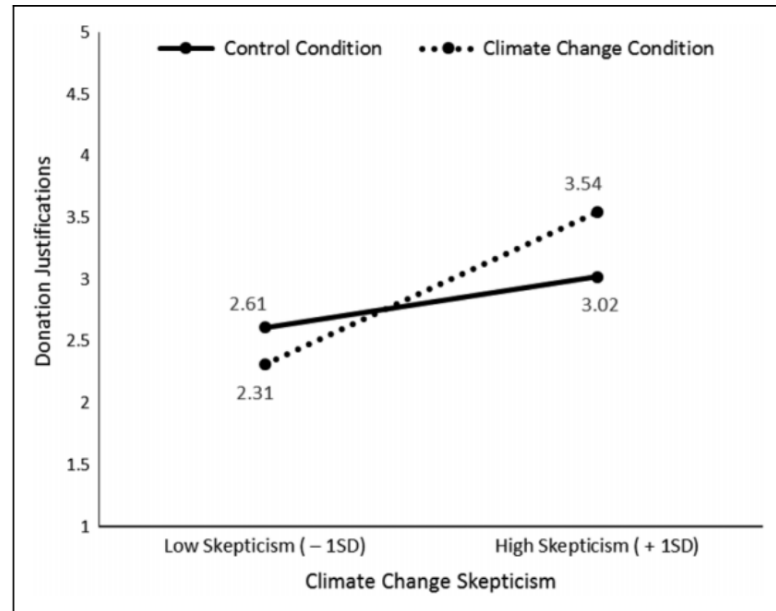
# The Impact of Disaster Framing on Donation Justifications

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```
mod2 %>%  
  marginaleffects::comparisons(  
    variables = list(frame = c(0, 1)),  
    newdata    = datagrid(skeptic = function(x) c(-sd(x), sd(x)))  
  ) %>%  
  as_tibble()
```

rowid	term	contrast	estimate	std.error	statistic	p.value	conf.low	conf.high
1	frame	1 - 0	-0.292	0.159	-1.838	0.066	-0.603	0.019
2	frame	1 - 0	0.526	0.159	3.318	0.001	0.215	0.837

# Figure 1



**Figure 1.** Donation justifications scores as a function of the interaction between climate change skepticism and experimental condition.

```
library(marginalEffects)
```

```
mod2 %>%
```

```
  marginalEffects::predictions(
```

```
    newdata = datagrid(
```

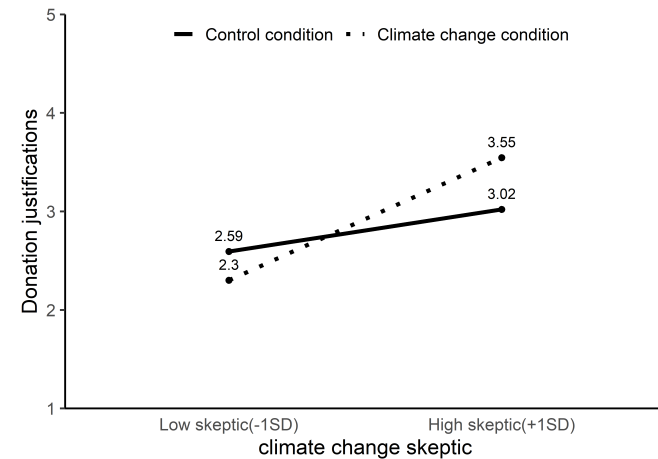
```
      frame = unique,
```

```
      skeptic = function(x) c(sd(x), -sd(x))
```

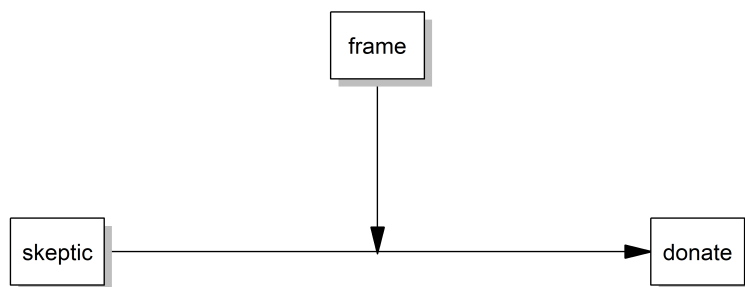
```
    )
```

```
  ) %>%
```

```
  as_tibble()
```



# Moderated Mediation Analysis

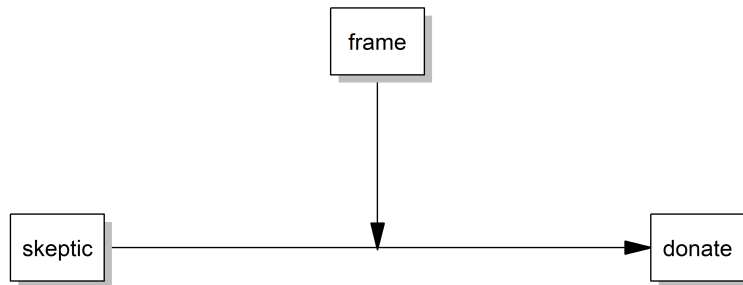


```
library(modelsummary)

dc <- d %>%
  mutate(across(c(skeptical), ~ .x - mean(.x))) %>%
  mutate(frame = as.factor(frame))

mod1 <- lm(donate ~ skeptical, data = dc)
mod2 <- lm(donate ~ skeptical + frame + frame:skeptical, data = dc)
```

# Moderated Mediation Analysis



```
library(modelsummary)
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```
dc <- d %>%  
  mutate(across(c(skeptical), ~ .x - mean(.x))) %>%  
  mutate(frame = as.factor(frame))
```

```
mod1 <- lm(donate ~ skeptical, data = dc)  
mod2 <- lm(donate ~ skeptical + frame + frame:skeptical, data = dc)
```

	mod1				mod2			
	Est.	2.5 %	97.5 %	p	Est.	2.5 %	97.5 %	p
skeptical	-0.220***	-0.303	-0.137	0.000	-0.140*	-0.254	-0.025	0.017
frame1					0.103	-0.233	0.438	0.547
skeptical × frame1					-0.171*	-0.336	-0.005	0.043
Num.Obs.	211				211			
R2	0.116				0.134			
R2 Adj.	0.111				0.122			
AIC	694.2				693.6			
BIC	704.2				710.4			
Log.Lik.	-344.087				-341.819			
F	27.303				10.709			
RMSE	1.24				1.22			

# Moderated Mediation Analysis

perspective, we also anticipated there would be an interaction between climate change skepticism and experimental condition on attitudes about donating that would mirror the effects shown for donation justifications. Thus, we tested for the interaction of climate skepticism and framing condition on donation attitudes, controlling for political ideology. Consistent with the findings for the donation justification measures, there was a significant interaction on attitudes about donating ( $b = -.17$ ,  $SE_b = 0.08$ ,  $t = -2.10$ ,  $p = .041$ , 95% CI =  $[-0.336, -0.007]$ ). In the climate change condition, greater climate change skepticism predicted less positive attitudes toward donating ( $b = -.32$ ,  $SE_b = 0.07$ ,  $t = -4.85$ ,  $p < .001$ , 95% CI =  $[-0.452, -0.191]$ ). There was also a weaker (but significant) relationship in the control condition ( $b = -.15$ ,  $SE_b = 0.06$ ,  $t = -2.33$ ,  $p = .021$ , 95% CI =  $[-0.276, -0.023]$ ). Thus, climate change skepticism predicts donation attitudes, and this relationship is significantly stronger in the climate change framing condition than the natural drought condition. Therefore, next we tested whether this relationship was mediated by the justifications for/against providing aid.

```
library(modelsummary)
```

```
dc <- d %>%  
  mutate(across(c(skeptic), ~ .x - mean(.x))) %>%  
  mutate(frame = as.factor(frame))
```

```
mod1 <- lm(donate ~ skeptic, data = dc)  
mod2 <- lm(donate ~ skeptic + frame + frame:skeptic, data = dc)
```

	mod1				mod2			
	Est.	2.5 %	97.5 %	p	Est.	2.5 %	97.5 %	p
skeptic	-0.220***	-0.303	-0.137	0.000	-0.140*	-0.254	-0.025	0.017
frame1					0.103	-0.233	0.438	0.547
skeptic × frame1					-0.171*	-0.336	-0.005	0.043
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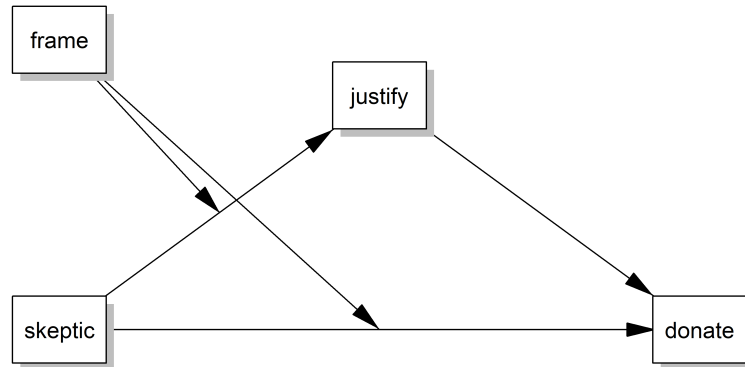
# Moderated Mediation Analysis

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```
mod2 %>%  
  marginaleffects::slopes(  
    variables = "skeptical",  
    newdata = datagrid( frame = c(0, 1) )  
  ) %>%  
  as_tibble()
```

rowid	term	estimate	std.error	statistic	p.value	conf.low	conf.high
1	skeptical	-0.140	0.058	-2.411	0.016	-0.253	-0.026
2	skeptical	-0.310	0.061	-5.105	0.000	-0.429	-0.191

# SEM



```
model <- "  
  
  justify ~ a1*skeptic + a2*frame + a3*skeptic:frame  
  donate  ~ c1*skeptic + c2*frame + c3*skeptic:frame + b*justify  
  
  frame ~ frame.mean*1  
  frame ~~ frame.var*frame  
  
  index.mod.med      := a3*b  
  
  CE.XonM            := a1 + a3*frame.mean  
  CE.XonM.below      := a1 + a3*0  
  CE.XonM.above      := a1 + a3*1  
  
  indirect           := (a1 + a3*frame.mean)*(b)  
  indirect.below     := (a1 + a3*0)*(b)  
  indirect.above     := (a1 + a3*1)*(b)  
  
  direct             := c1 + c3*frame.mean  
  direct.below       := c1 + c3*0  
  direct.above       := c1 + c3*1  
  
"  
  
semfit <- sem(model,  
  data      = d,  
  estimator = "ML",  
  se        = "bootstrap",  
  bootstrap = 1000,  
  mimic     = "Mplus")
```

# SEM

Using Hayes' PROCESS macro for SPSS 22 (Model 8), we conducted a moderated mediation analysis testing moderation (by experimental condition) of both the direct and indirect paths (i.e., mediated by donation justifications) from skepticism to donation attitudes. As predicted, Hayes' index of moderated mediation (which uses bootstrapping methods to test for moderated mediation, see Hayes, 2015) did not pass through zero (95% bootstrapped CIs  $b = -.19$ ,  $SE_{boot} = 0.06$ , 95% CI =  $[-0.316, -0.071]$ ). This test indicates that the strength of the indirect effect from skepticism to attitudes about donating through donation justifications was significantly different in the climate change and natural drought conditions. Follow-up examination of each of these conditional indirect effects indicates that there was a significant indirect effect of skepticism on donation attitudes through donation decision justifications for participants in the climate change condition ( $b = -.28$ ,  $SE_{boot} = 0.05$ , 95% CI =  $[-0.393, -0.185]$ , 95% CIs generated using 10,000 bootstrapped samples). There was also a significant indirect effect in the natural drought condition, although to a lesser extent ( $b = -.09$ ,  $SE_{boot} = .04$ , 95% CI =  $[-0.181, -0.008]$ ). Furthermore, after accounting for the indirect (i.e., mediated) effects, there was no significant conditional direct effect in the control ( $b = -.06$ ,  $SE_b = 0.05$ ,  $ns$ ) or the climate change condition ( $b = -.04$ ,  $SE_b = 0.06$ ,  $ns$ ).<sup>2</sup>

semfit %>%  
parameterEstimates(standardized = TRUE)

label	est	se	z	pvalue	ci.lower	ci.upper
a1	0.105	0.042	2.496	0.013	0.023	0.184
a2	-0.562	0.225	-2.502	0.012	-1.030	-0.129
a3	0.201	0.061	3.277	0.001	0.080	0.317
c1	-0.043	0.058	-0.730	0.466	-0.162	0.069
c2	0.160	0.272	0.590	0.555	-0.379	0.727
c3	0.015	0.077	0.195	0.846	-0.134	0.169
b	-0.923	0.080	-11.509	0.000	-1.072	-0.753
index.mod.med	-0.186	0.061	-3.032	0.002	-0.308	-0.071
CE.XonM	0.201	0.032	6.342	0.000	0.135	0.262
CE.XonM.below	0.105	0.042	2.495	0.013	0.023	0.184
CE.XonM.above	0.306	0.045	6.834	0.000	0.216	0.389
indirect	-0.186	0.034	-5.524	0.000	-0.251	-0.120
indirect.below	-0.097	0.039	-2.494	0.013	-0.169	-0.021
indirect.above	-0.283	0.050	-5.601	0.000	-0.385	-0.190
direct	-0.035	0.040	-0.884	0.377	-0.112	0.045
direct.below	-0.043	0.058	-0.729	0.466	-0.162	0.069
direct.above	-0.028	0.052	-0.531	0.595	-0.129	0.073

# 感谢 R 和 Stan 语言之美!

本幻灯片由 R 包 `xaringan` 和 `flipbookr` 生成