对《Surprisingly Happy to Have Helped: Underestimating Prochirality Creates a Misplaced Barrier to Asking for Help》的可重复性研究

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Introduction

One observational study conducted in eight cultures around the world found that 88% of naturally occurring requests were fulfilled (Floyd et al., 2018). Indeed, helping others in need seems to be an intuitive response (Zaki & Mitchell, 2013) that tends to leave helpers feeling positive (Andreoni, 1990; Curry et al., 2018; Dunn et al., 2008; Harbaugh et al., 2007). If receiving help usually benefits recipients, and if providing help leaves helpers feeling positive, then what psychological barriers might keep people from making a request that could improve both their own and a helper's well-being? People misunderstand others' reactions to a direct request for help (Bohns, 2016). Specifically, we hypothesize that those in need of help underestimate the strength of others' prosocial motivation to help when asked directly — consequently underestimating how willingly others will help and how positively others will feel about helping. Failing to fully appreciate how much others will genuinely want to help, and will feel positive for doing so, could then leave people overly reluctant to asking for help more often in daily life.

Our hypotheses are based on several existing findings. First, human beings are deeply social. Second, people may systematically underestimate how positively others respond to one's own sociality, which creates a barrier to engaging with others more often. Finally, experiments across a variety of contexts indicate that people reliably underestimate the likelihood that others will agree to their direct requests. However, construing requests for help as attempts to induce compliance may not be the way that potential helpers interpret their experience.

In sum, our theory that requests for help activate prosocial motivation also predicts that people underestimate others' likelihood of agreeing to requests but suggests a different mechanism that makes unique predictions about how requesters might misunderstand a recipient's experience; and predicts that people do not simply misunderstand the likelihood that others will agree to a direct request for help but that they misunderstand the psychological experience of those asked directly for help.

Experiment 1a: Can I Use Your Phone?

Method

Participants. In this experiment, we targeted a sample size of 50 participants per condition. This sample size is sufficient to capture a small-to-medium effect size ($d = 0.40$) in a two-sample t test. For Experiment 1a, we targeted a total sample size of 200 participants and recruited through the end of our last scheduled shift as we approached that target. A total of 201 participants (age: M = 36.73 years, SD = 15.14; 50% female) completed the experiment in exchange for a small gift. We excluded five additional participants who reported being younger than 18 years old.

Design and procedure. We adapted a commonly used scenario from prior research in which one person asks another to borrow a cell phone (e.g., Flynn & Lake, 2008). We recruited visitors at a public park and randomly assigned them to imagine either asking to borrow a cell phone from a stranger at that location (requester condition) or being asked the same request by a stranger (helper condition). In addition, we also introduced an exploratory manipulation on gratitude expression to examine how explicit appreciation might affect participants' expectations. This yielded a 2 (perspective: requester vs. helper) × 2 (gratitude: mentioned vs. not mentioned) between-participants design. To minimize the potential motivation for socially desirable responding in this and all subsequent experiments, we told all participants during the informed-consent process that their survey responses would be completely anonymous. We did not collect any identifying information at any point in the experiment, to be consistent with what was stated on the informed-consent sheet.

Participants received a tablet to read the study scenario and provided their responses in private. This scenario included two stages: the requester first making a request, and the helper then fulfilling the request. In the first stage, participants in the requester condition imagined that they were in need of a cell phone to handle an emergency and approached a stranger nearby and asked to borrow their phone, whereas participants in the helper condition imagined being approached by a stranger with the same request. After reading the request, participants reported their expectations—written from the perspective of either a requester or a potential helper—about how willing, and also how likely, the potential helper was to help on scales ranging from 0 (*not at all*) to 10 (*extremely*). Participants then answered four questions adapted from Flynn and Lake (2008), one asking participants to predict the percentage of people who would agree to this request (0%–

100%) and three measuring the discomfort of declining a request (how difficult, awkward, or embarrassing it would be for the helper to say "no"; α = .82) on scales ranging from 0 to 10.

In the second stage, participants imagined that the helper agreed to the request and offered help. Participants in the gratitude condition further imagined that the requester explicitly thanked the helper, whereas those in the no-gratitude condition did not receive this additional information. Participants then indicated how positive/negative, pleased, inconvenienced, and annoyed they expected the helper (either oneself or another person, depending on perspective conditions) to feel after the interaction, using scales ranging from 0 (*not at all*) to 10 (*extremely*), except that the positive/negative item included a scale of −5 (*much more negative than normal*) to 5 (*much more positive than normal*), with 0 (*no different than normal*) as the midpoint, which we transformed from 0 to 10 prior to data analysis. Participants also reported their beliefs about the helper's motives—two items measuring the perceived strength of prosocial motivation (e.g., "they wanted to see me out of my trouble"; "they believed their small favor would mean a lot to me"), and two items measuring the perceived strength of compliance motivation (e.g., "they wanted to avoid saying 'no' to me"; "they were forced by the social pressure"). All motivation-attribution items were presented in a random order on scales ranging from −3 (*strongly disagree*) to 3 (*strongly agree*).

Results

Willingness to help. Estimates of how willing and how likely the helper would be to help were highly correlated ($r = .86$, $p < .001$), so we averaged them into a composite measure. As predicted, participants who imagined asking for help expected the other person to be significantly less willing and likely to offer help ($M = 5.16$, $SD = 2.38$) than participants who imagined being asked for help ($M = 6.66$, $SD = 2.56$), $t(199) = -4.30$, $p < .001$, $d = -0.61$.

Estimated percentage of agreement. In one experiment, Flynn and Lake (2008; Study 4) reported that participants who imagined seeking help expected a smaller percentage of people to agree to their request than those who imagined being asked for help across four scenarios (34.3% vs. 49.6%), including a cell-phone scenario similar to the version used here. Unlike this reported result, the estimated percentage of people who would agree to help in Experiment 1a did not differ significantly between those who imagined asking for help ($M = 50.3\%$, $SD = 21.7\%$) and those who imagined being asked for help ($M = 46.9\%$, $SD = 21.6\%$), $t(199) = 1.12$, $p = .26$, $d = 0.16$.

Discomfort rejecting request. Prior research suggests that those seeking help may underestimate how likely others were to agree to a request because they underestimated potential helpers' discomfort rejecting a request for help (Flynn & Lake, 2008). Unlike this result, the estimated discomfort of rejecting a request in Experiment 1a did not differ between those who imagined asking for help ($M = 4.74$, $SD = 2.34$) and those who imagined being asked for help ($M = 4.87$, $SD = 2.76$), $t(196) = -0.36$, $p = .72$, $d = -0.05$.

Helping experience. We observed a somewhat low Cronbach's α among the four items (α = .65), indicating that they are measuring different components of helping experience. We therefore conducted a principal components analysis (PCA) and found that they loaded onto two separate components, one with two items measuring how positive and pleased the helper would feel ($r = .59$, $p < .001$) and the other with two items measuring how inconvenient and annoyed the helper would feel ($r = .51$, $p < .001$). We therefore averaged ratings of each pair of items to compute two composite scores, one referring to positive mood and the other to perceived inconvenience, which were only moderately correlated with each other ($r = -.26$, $p < .001$). We conducted separate analyses on these two composites.

Positive mood. A 2 (perspective) × 2 (gratitude) analysis of variance (ANOVA) on positive mood indicated a significant main effect of perspective, $F(1, 197) = 7.36$, $p = .007$, $\eta_p^2 = .036$, a significant main effect of gratitude expression, $F(1, 197) = 7.97$, $p = .005$, $\eta_p^2 = .039$, and a nonsignificant interaction, $F(1, 197) = 2.16$, $p = .14$. Participants who imagined asking another person for help expected the helper to feel less positive after the interaction ($M = 6.96$, $SD = 1.96$) than did participants who imagined being asked for help ($M = 7.67$, $SD = 1.86$). In addition, participants in both perspectives expected the expression of gratitude to increase the helper's positive mood ($M = 7.70$, $SD = 1.71$) compared with when the gratitude was not mentioned ($M = 6.95$, $SD = 2.08$).

Inconvenience. A 2 × 2 ANOVA on perceived inconvenience indicated only a significant main effect of perspective, $F(1, 196) = 51.29$, $p < .001$, $\eta_p^2 = .21$. Those who imagined asking for help expected the helper to feel more inconvenienced ($M = 4.04$, $SD = 1.79$) than those who imagined being asked for help ($M = 2.16$, $SD = 1.90$).

Motivation. We again observed a somewhat low Cronbach's α among the four motivation attribution items (α =.61). We then conducted a PCA and confirmed that they loaded on two

separate components, with two items primarily measuring prosocial motivation ($r = .54$, $p < .001$), and two items primarily measuring compliance motivation ($r = .56$, $p < .001$). We averaged each pair of items to calculate a composite score and confirmed that those two scores were only weakly correlated with each other ($r = -.20$, $p < .001$). We therefore analyzed these two composite scores separately.

A 2 × 2 ANOVA on prosocial motivation indicated only a significant main effect of perspective, $F(1, 194) = 42.13$, $p < .001$, $\eta_p^2 = .18$. As predicted, participants who imagined asking for help expected the potential helper to have weaker prosocial motivation ($M = 0.99$, $SD = 1.19$) than did participants who imagined being asked for help ($M = 1.96$, $SD = 0.88$).

A 2 × 2 ANOVA on compliance motivation also indicated only a significant main effect of perspective, $F(1, 193) = 41.77$, $p < .001$, $\eta_p^2 = .18$. Again, participants who imagined asking for help expected the potential helper to have stronger compliance motivation ($M = 0.54$, $SD = 1.36$) than did those who imagined being asked for help ($M = -0.81$, $SD = 1.56$). Those who imagined asking for help expected others to be more motivated by compliance, whereas those who imagined being asked expected to be more motivated by prosociality.

Mediation analysis. Our theory predicts that those seeking help underestimate how positively helpers will react because they underestimate the extent to which asking for help can trigger prosocial motivation in a helper and overestimate the extent to which requests induce compliance motivation. To examine whether our results are consistent with this prediction, we conducted mediation analyses to examine the extent to which motivation attributions mediated perspective differences in helpers' (a) willingness to help, (b) positive mood from helping, and (c) perceived inconvenience of helping. For each outcome variable, we constructed a mediation model with perspective as the independent variable and prosocial and compliance motivations as simultaneous mediators using the PROCESS (Version 4.0) macro in SPSS (Model 4; Hayes, 2013).

As shown in **Figure 4a**, perspective differences in motivation attributions accounted for a statistically significant proportion of variance in the perspective difference on willingness to help. In particular, underestimating helpers' prosocial motivation—yet not overestimating helpers' compliance motivation—significantly mediated the perspective difference on willingness to help.

Motivation attributions also accounted for a statistically significant proportion of variance in the perspective gap on the helpers' experiences. Specifically, underestimating helpers' prosocial

motivation significantly mediated underestimating positive mood (see **Fig. 4b**), whereas overestimating compliance motivation significantly mediated overestimating perceived inconvenience (see **Fig. 4c**).

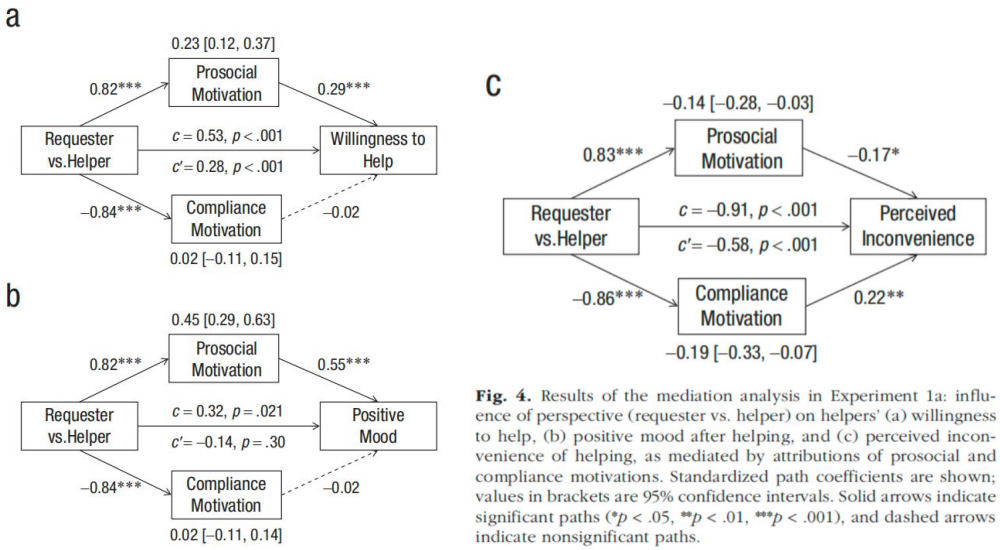

Fig. 4. Results of the mediation analysis in Experiment 1a: influence of perspective (requester vs. helper) on helpers' (a) willingness to help, (b) positive mood after helping, and (c) perceived inconvenience of helping, as mediated by attributions of prosocial and compliance motivations. Standardized path coefficients are shown; values in brackets are 95% confidence intervals. Solid arrows indicate significant paths (*$p < .05$, **$p < .01$, ***$p < .001$), and dashed arrows indicate nonsignificant paths.

Research Replication Process

We used R (Version 4.2.2) and the R-packages *tidyverse*, *easystats*, *papaja*, *lsr*, *plyr*, *psych*, and *bruceR* for all our analyses.

We first import the raw data and do a preliminary cleaning of the data. We need to generate several new variables, as required by the experiment.

```
  {r setup}
rm(list = ls())

# 检查是否已安装 pacman
if (!requireNamespace("pacman", quietly = TRUE)) {
  install.packages("pacman") }   # 如果未安装，则安装包

# 使用p_load来载入需要的包
pacman::p_load("tidyverse","easystats",'psych','papaja','lsr','plyr','bruceR')

# load data:
dt.raw <-  read.csv('./Study_1a_data.csv',
                    header = T, sep=",", stringsAsFactors = FALSE)
```

```
```{r prepare the data}
dt.study1 <- dt.raw %>%
  dplyr::mutate(Role = factor(Role, levels = c("Requester", "Helper"),labels = c("Requesters",
"Helpers")))%>%
  dplyr::mutate(ID = as.factor(ID))%>%
  dplyr::mutate(PositiveMood=(Positive+S+Pleased)/2)%>%
  #积极/消极项目的测量采用的是(-5)-(5)量表，在数据分析前转换为0-10分制计分的结果
  dplyr::mutate(InconveniencePerc=(Inconvenient + Annoyed)/2)%>%
  dplyr::mutate(ProsocialAttr=(Prosocial1 + Prosocial2)/2)%>%
  dplyr::mutate(ComplyAttr=(Comfort1 + Conform2)/2)%>%
  dplyr::mutate(Willingness=(Willing + Likely)/2)%>%
  dplyr::mutate(Discomfort=(Difficult+Awkward+Embarrased)/3)
```

Willingness to help

We first tested whether the two items "willing" and "Likely" are highly correlated before combining them to calculate a composite score by using *cor.test*. We then conducted a *t*-test to compare the differences in willingness scores between the different role groups (Requesters vs. Helpers).
```

```r
cor.test(dt.study1$Willing, dt.study1$Likely, method=c("pearson"))
```
#t test
```r
bruceR::TTEST(data=dt.study1,
              y="Willingness",
              x="Role")
#比较不同Role条件下在Willingness得分上的差异
#Willingness=(Willing + Likely)/2
```

Estimated percentage agreement

We conducted a *t*-test to compare the differences in the estimated percentage of people who would agree to help between the different role groups (Requesters vs. Helpers).

```r
bruceR::TTEST(data=dt.study1, y="PercentageAgree_1",x="Role")
```

Discomfort rejecting request

First, calculated Cronbach's alphas for difficult, awkward, and embarrassed items by using the function *psy::alpha()*. Then we conducted a *t*-test to compare the differences in discomfort scores between the different role groups (Requesters vs. Helpers).

```r
#计算difficult、awkward、embarrassed三个条目的Cronbach's alphas
dt.study1 %>%
  dplyr::select(Difficult:Embarrased)%>%
  psych::alpha()
# t test
bruceR::TTEST(data=dt.study1, y="Discomfort",x="Role")
```

Expernece of Helping

Should we calculate one or two composite scores of positive and negative mood? So we conduct a PCA analysis.

```r
after_mood<-dt.study1 %>%
  dplyr::select(Positive:Pleased)%>%
  dplyr::mutate(Positive=Positive+5)
alpha(after_mood,check.keys=TRUE)
scree(after_mood)

pca_after_mood <- principal(after_mood, nfactors=2, rotate="varimax")
print(pca_after_mood)
```

Noted that the Cronbach's alpha for these four mood items is only .65. And PCA revealed two separate PCs. So we analyzed positive mood and inconvenience perception separately. But before that, we confirmed on their correlation coefficients.

```r
cor.test(dt.study1$Positive, data_study1$Pleased, method=c("pearson"))
cor.test(dt.study1$Annoyed, data_study1$Inconvenient, method=c("pearson"))
#Between these two constructs:
cor.test(dt.study1$PositiveMood, dt.study1$InconveniencePerc, method=c("pearson"))
```

Hence, positive mood and inconvenience perception should be treated as two separate constructs.

We used function *aov()* to conduct a 2 (perspective) × 2 (gratitude) analysis of variance

(ANOVA) on PositiveMood and Inconvenience Perception. Some descriptive statistics were then calculated. After that, function *ggplot2::ggplot()* was used to create pictures.

```
#方差分析2 (perspective) × 2 (gratitude) analysis of variance (ANOVA) on positive mood
p_mood_aov <- aov(PositiveMood ~ Role * Gratitude, data = dt.study1)
summary(p_mood_aov)
lsr::etaSquared(p_mood_aov)
#描述性统计：计算不同Role条件下被试在PositiveMood得分上的均值、标准差等；以及不同Gratitude组被试在PositiveMood得分上的均值、标准差、标准误
ddply(dt.study1, c("Role"), summarise,
              N    = length(PositiveMood),
              mean = mean(PositiveMood, na.rm=T),
              sd   = sd(PositiveMood, na.rm=T),
              se   = sd / sqrt(N-1))

ddply(dt.study1, c("Gratitude"), summarise,
              N    = length(PositiveMood),
              mean = mean(PositiveMood, na.rm=T),
              sd   = sd(PositiveMood, na.rm=T),
              se   = sd / sqrt(N-1))
```

```
#方差分析2 (perspective) x 2 (gratitude) analysis of variance (ANOVA) on Inconvenience Perception
inconve_aov <- aov(InconveniencePerc ~ Role * Gratitude, data = dt.study1)
summary(inconve_aov)
etaSquared(inconve_aov)
#描述性统计
ddply(dt.study1, c("Role"), summarise,
              N    = length(InconveniencePerc),
              mean = mean(InconveniencePerc, na.rm=T),
              sd   = sd(InconveniencePerc, na.rm=T),
              se   = sd / sqrt(N-1))
```

```
dt.study1_PM <- dt.study1 %>%
  dplyr::group_by(Role,Gratitude) %>%
  dplyr::summarise(PositiveMood_mean = mean(PositiveMood,na.rm = TRUE),
                   SD_PositiveMood = sd(PositiveMood,na.rm = TRUE),
                   SE_PositiveMood = SD_PositiveMood/sqrt(n()-1),
                   n = n()) %>%
  dplyr::ungroup()
#绘图
p4<-ggplot2::ggplot(data=dt.study1_PM,aes(x=Role,y=PositiveMood_mean,fill=Gratitude))+
  geom_bar(stat='identity',width=0.8,position=position_dodge(.9))+
  labs(y='positive mood')+
  geom_errorbar(aes(ymin=PositiveMood_mean-SE_PositiveMood ,
                    ymax=PositiveMood_mean+SE_PositiveMood),
                    width=.05,
                    position = position_dodge(.9))+
  scale_y_continuous(expand = c(0,0))+
  scale_fill_brewer(palette = "Blues")+
  papaja::theme_apa()
p4
```

```
#InconveniencePerc=(Inconvenient + Annoyed)/2
dt.study1_inconve <- dt.study1 %>%
  dplyr::group_by(Role,Gratitude) %>%
  dplyr::summarise(InconveniencePerc_mean = mean(InconveniencePerc,na.rm = TRUE),
                   SD_InconveniencePerc = sd(InconveniencePerc,na.rm = TRUE),
                   SE_InconveniencePerc = SD_InconveniencePerc/sqrt(n()-1),
                   n = n()) %>%
  dplyr::ungroup()
#绘图
p5<-ggplot2::ggplot(data=dt.study1_inconve,aes(x=Role,y=InconveniencePerc_mean,fill=Gratitude))
+
  geom_bar(stat='identity',width=0.8,position=position_dodge(0.9))+
  labs(y='Inconvenience Perception')+
  geom_errorbar(aes(ymin=InconveniencePerc_mean-SE_InconveniencePerc ,
                    ymax=InconveniencePerc_mean+SE_InconveniencePerc),
                    width=.05,
                    position = position_dodge(0.9))+
  scale_y_continuous(expand = c(0,0),breaks = seq(0,5,2))+
  scale_fill_brewer(palette = "Blues")+
  papaja::theme_apa()
p5
```

Motivation Attribution

Should we analyze prosocial and compliance motivations separately? Again, we started with PCA which confirmed that they loaded on two separate components, with two items primarily measuring prosocial motivation (r = .54, p < .001), and two items primarily measuring compliance motivation (r = .56, p < .001). We averaged each pair of items to calculate a composite score and confirmed that those two scores were only weakly correlated with each other (r = -.20, p < .001). We therefore analyzed these two composite scores separately.

```
##PCA分析
attribution <- dt.study1 %>%
  dplyr::select(Prosocial1:Conform2)

psych::alpha(attribution, check.keys=TRUE)
scree(attribution)

pca_attribution <- principal(attribution, nfactors=2, rotate="varimax")
print(pca_attribution)
```

```
##测量Prosocial motivation亲社会动机的两个条目之间的相关性
cor.test(dt.study1$Prosocial1, dt.study1$Prosocial2, method=c("pearson"))
##测量依从性动机的两个条目之间的相关性
cor.test(dt.study1$Comfort1, dt.study1$Conform2, method=c("pearson"))
##测量亲社会动机与依从性动机之间的相关性
cor.test(dt.study1$ProsocialAttr, dt.study1$ComplyAttr, method=c("pearson"))
```

As previously analyzed, we conduct a 2 (perspective) × 2 (gratitude) analysis of variance (ANOVA) both on prosocial motivation and compliance motivation. In general, the code used was the same as that shown before, except that the dependent variables we analyzed were replaced in the key position.

Mediation analysis

We conducted mediation analyses to examine the extent to which motivation attributions mediated perspective differences in helpers' (a) willingness to help, (b) positive mood from helping, and (c) perceived inconvenience of helping. The main function used was *bruceR::PROCESS*. The analysis of the other two mediation models simply replaces the "y = " with InconveniencePerc and PositiveMood.

```r
bruceR::PROCESS(dt.study1,
                x = "Role", #自变量
                y = "Willingness", # 因变量
                meds = c("ProsocialAttr","ComplyAttr"), # 中介变量
                med.type = c("parallel"),
                ci = c("boot"), # 置信区间使用bootstrap 或其他抽样方法
                nsim = 5000, # 抽样的次数
                seed = 10, # 设置seed可以让每次的抽样结果都一样
                center = FALSE, # 是否对自变量和调节变量中心化。非中心化在解释时更方便
                std = TRUE, # 是否在计算前对所有变量进行标准化
                digits = 3,
                )
```

Research Replication results

The results of our analysis are consistent with the original article, except for the results of the mediation analysis. In the original article, they used SPSS for the mediation model and we used R. The path coefficients we obtained do not agree with them, but overall the mediation model established.

In summary, the results showed that requesters underestimate the helper's willingness to help but do not underestimate the discomfort of refusing the request; underestimate the helper's positive emotions and overestimate their feelings of inconvenience; and underestimate the helper's prosocial motivation and overestimate their compliance motivation. The results of mediation analysis showed that the requester underestimates the helper's prosocial motivation rather than overestimating his or her compliance motivation, leading to an underestimation of the helper's actual willingness to help; the requester underestimates the helper's prosocial motivation rather than overestimating his or her compliance motivation, leading to an underestimation of the helper's positive emotions after helping. The requester underestimates the helper's prosocial motivation and overestimates his or her compliance motivation, leading to an overestimation of the helper's sense of inconvenience.

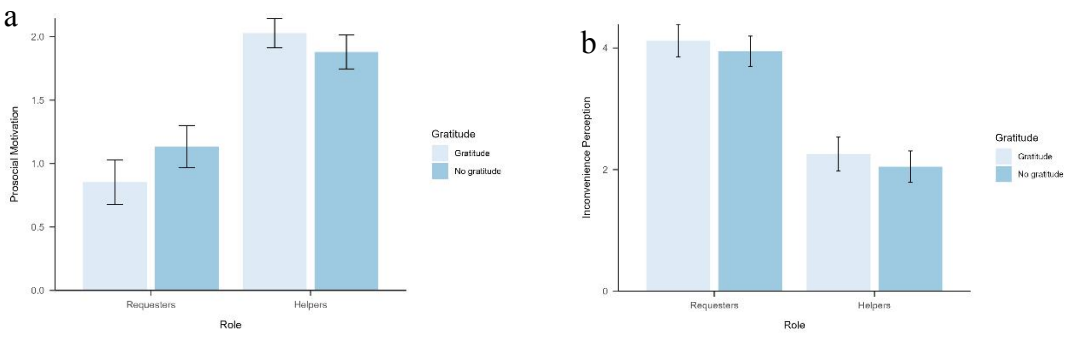

Figure 1. Results of our replication: mean ratings of perspective (requester vs. helper) on helpers' (a) positive mood after helping, and (b) perceived inconvenience of helping.

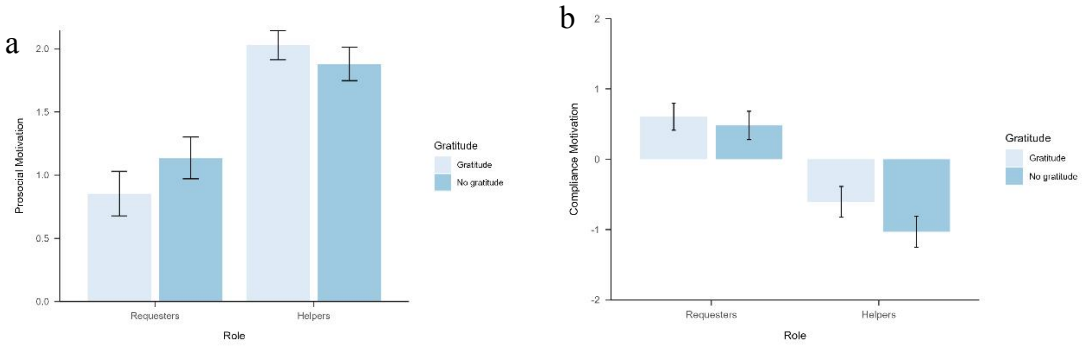

Figure 2. Results of our replication: mean attributions of perspective (requester vs. helper) on helpers' (a) prosocial motivation and (b) compliance motivation.

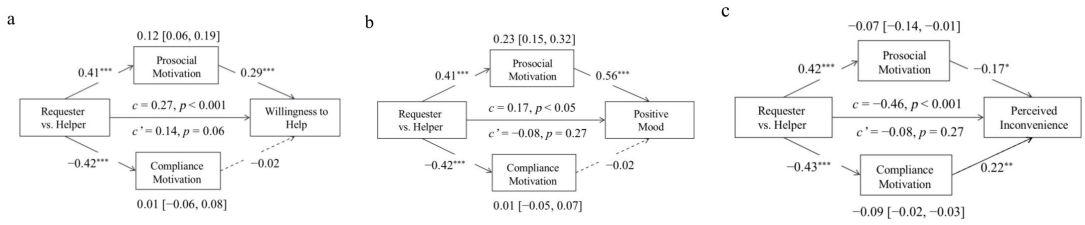

Figure 3. Results of the mediation analysis in our replication: influence of perspective (requester vs. helper) on helpers' (a) willingness to help, (b) positive mood after helping, and (c) perceived inconvenience of helping, as mediated by attributions of prosocial and compliance motivations. Standardized path coefficients are shown; values in brackets are 95% confidence intervals. Solid arrows indicate significant paths (*$p < .05$, **$p < .01$, ***$p < .001$), and dashed arrows indicate nonsignificant paths.

Discussion

Even though the authors provided the analysis codes they used, but we do not apply their codes to conduct our replication. It was not so difficult to do this research replication, we still learned some additional knowledge to refine our analysis codes.

Throughout the reproduction process, only the results of the mediation analysis were inconsistent with the original article, and we changed some settings but were still unable to replicate the authors' findings.

参考文献：

Zhao, X., & Epley, N. (2022). Surprisingly happy to have helped: Underestimating prosociality creates a misplaced barrier to asking for help. *Psychological Science*, *33*(10), 1708-1731.

小组分工

【组长】唐圆——文档撰写，汇报

【组员】谢梦菲——编写代码，复现实验结果

安迪——确定文献，PPT 制作，修订审阅内容