怀旧对创新技术反应的双刃剑模型

论文复现

38552109@qq.com

2023-12-07

我们的目标论文

AMERICAN PSYCHOLOGICAL ASSOCIATION

ISSN: 0022-3514

https://doi.org/10.1037/pspa0000368

怀旧

More Than a Barrier: Nostalgia Inhibits, but Also Promotes, Favorable Responses to Innovative Technology

Jianning Dang[1, 2], Constantine Sedikides[3], Tim Wildschut[3], and Li Liu[1, 2]

[1] Beijing Key Laboratory of Applied Experimental Psychology, Faculty of Psychology, Beijing Normal University

[2] State Key Laboratory of Cognitive Neuroscience and Learning, Faculty of Psychology, Beijing Normal University

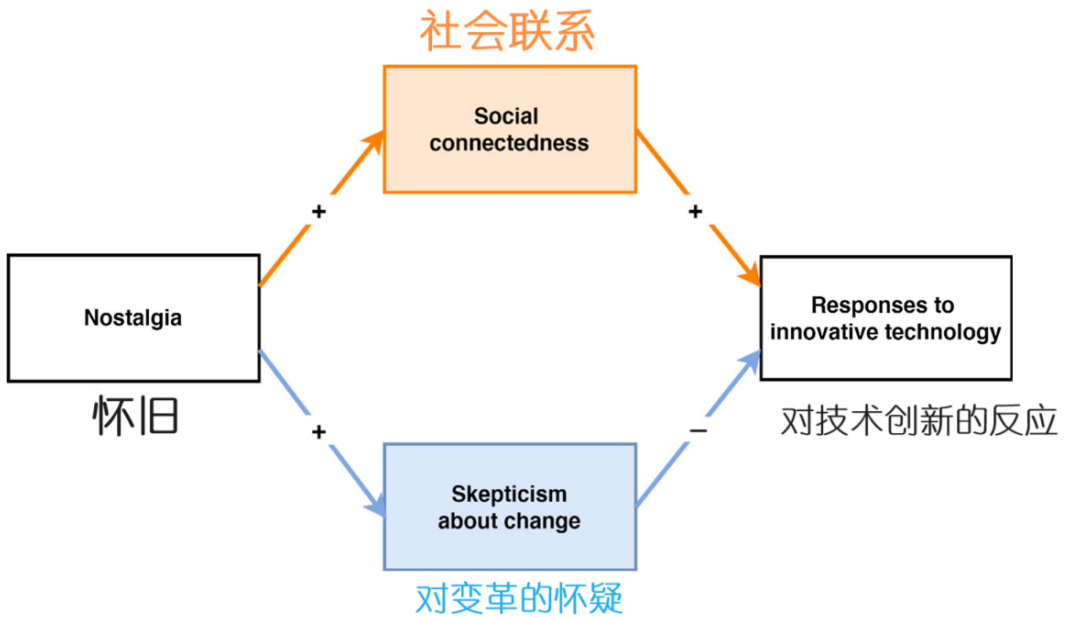
[3] Center for Research on Self and Identity, School of Psychology, University of Southampton

https://doi.org/10.1037/pspa0000368

双刃剑模型

文章提出一个双刃剑模型**捕捉**怀旧的双重性:

- 怀旧会通过增加对变革的怀疑来降低对创新技术的好感度。
- 同时，怀旧通过增加社会联系促进了对创新技术反应的好感度。



复现 Study 4

数据

```
library(tidyverse)

rawdat <- haven::read_sav("data/Study 4/Study 4.sav")

d <- rawdat %>%
  rowwise() %>%
  mutate(
    Nostalgia      = mean(c_across(starts_with("NOS"))),
    Skepticism     = mean(c_across(starts_with("SKEP"))),
    Social_connect = mean(c_across(starts_with("SCN"))),
    Support_robot  = mean(c_across(starts_with("SUPPORT"))),
    Adoption_robot =  sum(c_across(starts_with("ADOPT"))),
  ) %>%
  ungroup() %>%
  select(Mnos, Nostalgia, Skepticism, Social_connect, Support_robot, Adoption_robot)
```

Mnos	Nostalgia	Skepticism	Social_connect	Support_robot	Adoption_robot
0	5.33	3.00	2.25	5.33	4
0	5.33	4.75	3.00	4.33	3
1	7.00	3.75	4.50	4.67	0
1	5.33	5.00	5.00	5.00	3
1	7.00	5.25	6.00	5.33	4

Figure 5a

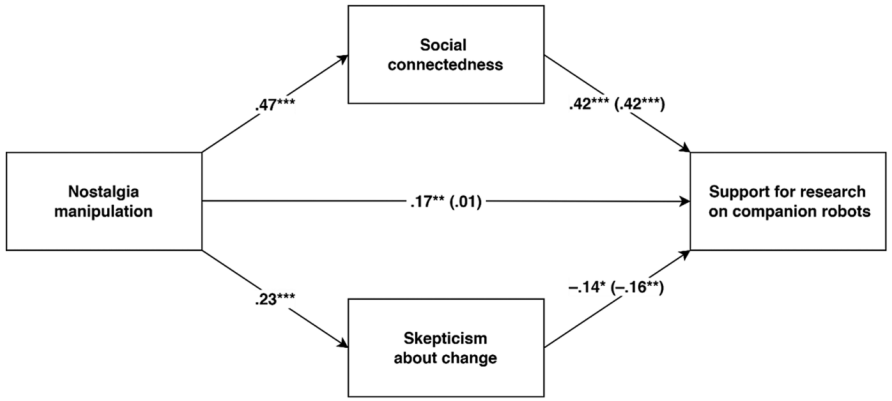

Social connectedness
.47***
.42*** (.42***)
Nostalgia manipulation
.17** (.01)
Support for research on companion robots
.23***
−.14* (−.16**)
Skepticism about change

Figure 5a

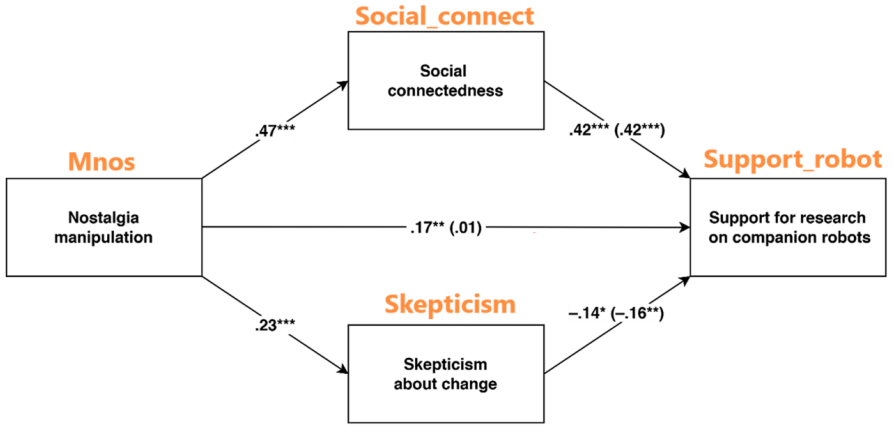
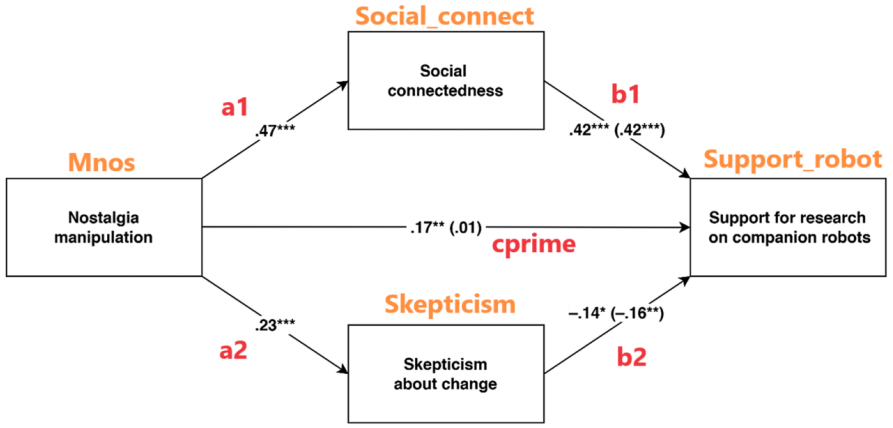
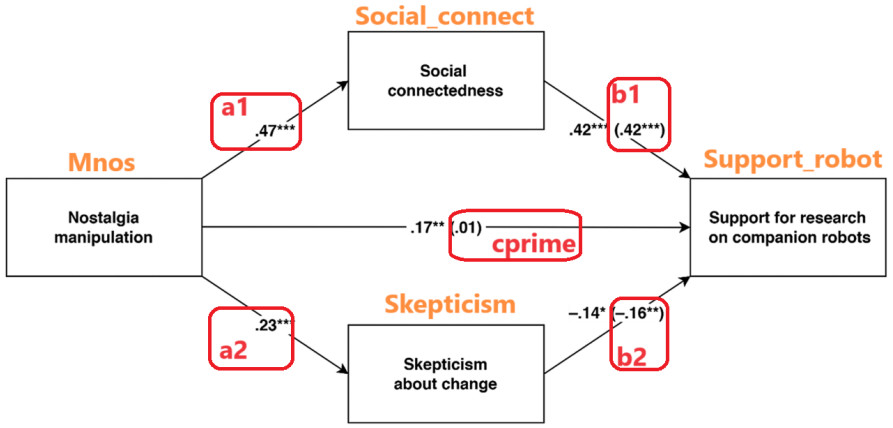

Social_connect
Social connectedness
.47***
.42*** (.42***)
Mnos
Support_robot
Nostalgia manipulation
.17** (.01)
Support for research on companion robots
Skepticism
−.14* (−.16**)
.23***
Skepticism about change

Figure 5a




```
library(lavaan)

model <- '

  Social_connect ~ a1 * Mnos
  Skepticism     ~ a2 * Mnos

  Support_robot  ~ cprime * Mnos + b1 * Social_connect +
                   b2 * Skepticism

  # define parameters
  a1b1       := a1 * b1
  a2b2       := a2 * b2
  indirect   := a1 * b1 + a2 * b2


'


fit <- sem(model,
           data      = d,
           estimator = "MLR",
           mimic     = "Mplus")
```

Figure 5a




```
fit %>%
  parameterestimates(standardized = T) %>%
  filter(op %in% c("~", ":=")) %>%
  select(label, est, se, pvalue,
         ci.lower, ci.upper, std.all)
```

label	est	se	pvalue	ci.lower	ci.upper	std.all
a1	1.6917	0.1844	0.0000	1.3302	2.0531	0.4680
b1	0.2856	0.0371	0.0000	0.2129	0.3583	0.4260
a2	0.5750	0.1437	0.0001	0.2933	0.8567	0.2251
b2	-0.1520	0.0540	0.0049	-0.2579	-0.0462	-0.1603
a1b1	0.4831	0.0771	0.0000	0.3319	0.6343	0.1994
a2b2	-0.0874	0.0377	0.0203	-0.1613	-0.0136	-0.0361
cprime	0.0132	0.1488	0.9291	-0.2784	0.3048	0.0055
indirect	0.3957	0.0889	0.0000	0.2215	0.5698	0.1633

Study 5a

Support for Research on Companion Robots. We specified a saturated model (Figure 5a). Nostalgia positively predicted social connectedness ($b = 1.69$, 95% CI [1.33, 2.05], $SE = 0.18$, $p < .001$, $z = 9.17$, $b^* = .47$), which in turn positively predicted support for research on companion robots ($b = 0.29$, 95% CI [0.07, 0.31], $SE = 0.04$, $z = 7.25$, $p < .001$, $b^* = .42$). At the same time, nostalgia positively predicted skepticism about change ($b = 0.58$, 95% CI [0.29, 0.86], $SE = 0.14$, $z = 4.00$, $p < .001$, $b^* = .23$), which in turn negatively predicted support for research on companion robots ($b = –0.15$, 95% CI [–0.40, –0.20], $SE = 0.05$, $z = –3.01$, $p = .003$, $b^* = –.16$). The indirect effects via social connectedness ($ab = 0.48$, 95% CI [0.35. 0.66]) and skepticism about change ($ab = –0.09$, 95% CI [–0.18, –0.02]) were significant. When controlling for these directionally opposite indirect effects, the direct effect of nostalgia on support for research on companion robots ($b = 0.01$, 95 CI [–0.20, 0.28], $SE = 0.15$, $z = 0.09$, $p = .927$, $b^* = .01$) was not statistically significant.

We also tested the tenability of an equality constraint on the absolute magnitude of the respective indirect effects via social

```
fit %>%
  parameterestimates(standardized = T) %>%
  filter(op %in% c("~", ":=")) %>%
  select(label, est, se, pvalue,
         ci.lower, ci.upper, std.all)
```

label	est	se	pvalue	ci.lower	ci.upper	std.all
a1	1.6917	0.1844	0.0000	1.3302	2.0531	0.4680
b1	0.2856	0.0371	0.0000	0.2129	0.3583	0.4260
a2	0.5750	0.1437	0.0001	0.2933	0.8567	0.2251
b2	-0.1520	0.0540	0.0049	-0.2579	-0.0462	-0.1603
a1b1	0.4831	0.0771	0.0000	0.3319	0.6343	0.1994
a2b2	-0.0874	0.0377	0.0203	-0.1613	-0.0136	-0.0361
cprime	0.0132	0.1488	0.9291	-0.2784	0.3048	0.0055
indirect	0.3957	0.0889	0.0000	0.2215	0.5698	0.1633

Study 5a

Support for Research on Companion Robots. We specified a saturated model (Figure 5a). Nostalgia positively predicted social connectedness ($b = 1.69$, 95% CI [1.33, 2.05], $SE = 0.18$, $p < .001$, $z = 9.17$, $b^* = .47$), which in turn positively predicted support for research on companion robots ($b = 0.29$, 95% CI [0.07, 0.31], $SE = 0.04$, $z = 7.25$, $p < .001$, $b^* = .42$). At the same time, nostalgia positively predicted skepticism about change ($b = 0.58$, 95% CI [0.29, 0.86], $SE = 0.14$, $z = 4.00$, $p < .001$, $b^* = .23$), which in turn negatively predicted support for research on companion robots ($b = –0.15$, 95% CI [–0.40, –0.20], $SE = 0.05$, $z = –3.01$, $p = .003$, $b^* = –.16$). The indirect effects via social connectedness ($ab = 0.48$, 95% CI [0.35. 0.66]) and skepticism about change ($ab = –0.09$, 95% CI [–0.18, –0.02]) were significant. When controlling for these directionally opposite indirect effects, the direct effect of nostalgia on support for research on companion robots ($b = 0.01$, 95 CI [–0.20, 0.28], $SE = 0.15$, $z = 0.09$, $p = .927$, $b^* = .01$) was not statistically significant.

We also tested the tenability of an equality constraint on the absolute magnitude of the respective indirect effects via social

```
fit %>%
  parameterestimates(standardized = T) %>%
  filter(op %in% c("~", ":=")) %>%
  select(label, est, se, pvalue,
         ci.lower, ci.upper, std.all)
```

label	est	se	pvalue	ci.lower	ci.upper	std.all
a1	1.6917	0.1844	0.0000	1.3302	2.0531	0.4680
b1	0.2856	0.0371	0.0000	0.2129	0.3583	0.4260
a2	0.5750	0.1437	0.0001	0.2933	0.8567	0.2251
b2	-0.1520	0.0540	0.0049	-0.2579	-0.0462	-0.1603
a1b1	0.4831	0.0771	0.0000	0.3319	0.6343	0.1994
a2b2	-0.0874	0.0377	0.0203	-0.1613	-0.0136	-0.0361
cprime	0.0132	0.1488	0.9291	-0.2784	0.3048	0.0055
indirect	0.3957	0.0889	0.0000	0.2215	0.5698	0.1633

贝叶斯 recode

Figure 5a

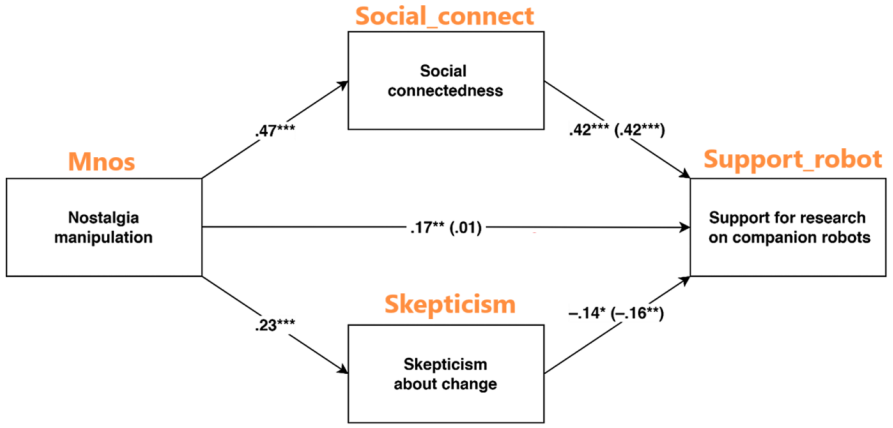
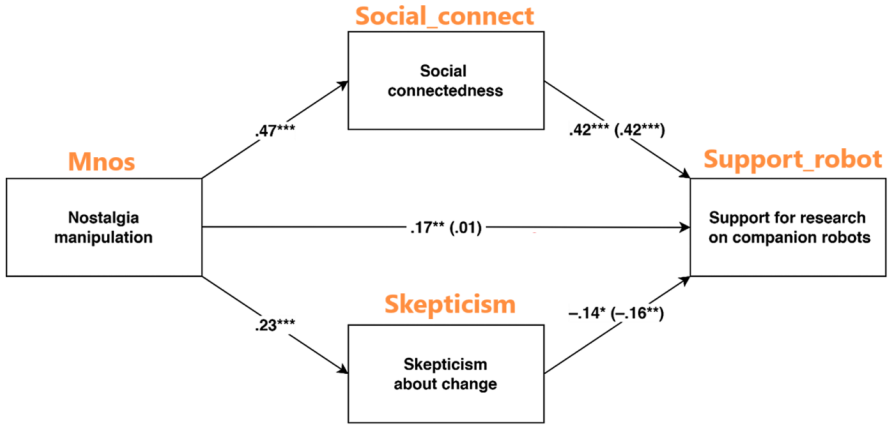

Social_connect
Social connectedness
.47***
.42*** (.42***)
Mnos
Support_robot
Nostalgia manipulation
.17** (.01)
Support for research on companion robots
Skepticism
−.14* (−.16**)
.23***
Skepticism about change

Figure 5a




```
library(brms)

mod <- brm(
  bf(Social_connect ~ Mnos) +
    bf(Skepticism ~ Mnos) +
    bf(Support_robot ~ Mnos + Social_connect + Skepticism) +
    set_rescor(FALSE),

  family = gaussian,
  data   = d,
  chains = 4,
  cores  = 4
)
```

Study 5a

Support for Research on Companion Robots. We specified a saturated model (Figure 5a). Nostalgia positively predicted social connectedness ($b = 1.69$, 95% CI [1.33, 2.05], $SE = 0.18$, $p < .001$, $z = 9.17$, $b^* = .47$), which in turn positively predicted support for research on companion robots ($b = 0.29$, 95% CI [0.07, 0.31], $SE = 0.04$, $z = 7.25$, $p < .001$, $b^* = .42$). At the same time, nostalgia positively predicted skepticism about change ($b = 0.58$, 95% CI [0.29, 0.86], $SE = 0.14$, $z = 4.00$, $p < .001$, $b^* = .23$), which in turn negatively predicted support for research on companion robots ($b = –0.15$, 95% CI [–0.40, –0.20], $SE = 0.05$, $z = –3.01$, $p = .003$, $b^* = –.16$). The indirect effects via social connectedness ($ab = 0.48$, 95% CI [0.35. 0.66]) and skepticism about change ($ab = –0.09$, 95% CI [–0.18, –0.02]) were significant. When controlling for these directionally opposite indirect effects, the direct effect of nostalgia on support for research on companion robots ($b = 0.01$, 95 CI [–0.20, 0.28], $SE = 0.15$, $z = 0.09$, $p = .927$, $b^* = .01$) was not statistically significant.

We also tested the tenability of an equality constraint on the absolute magnitude of the respective indirect effects via social

Study 5a

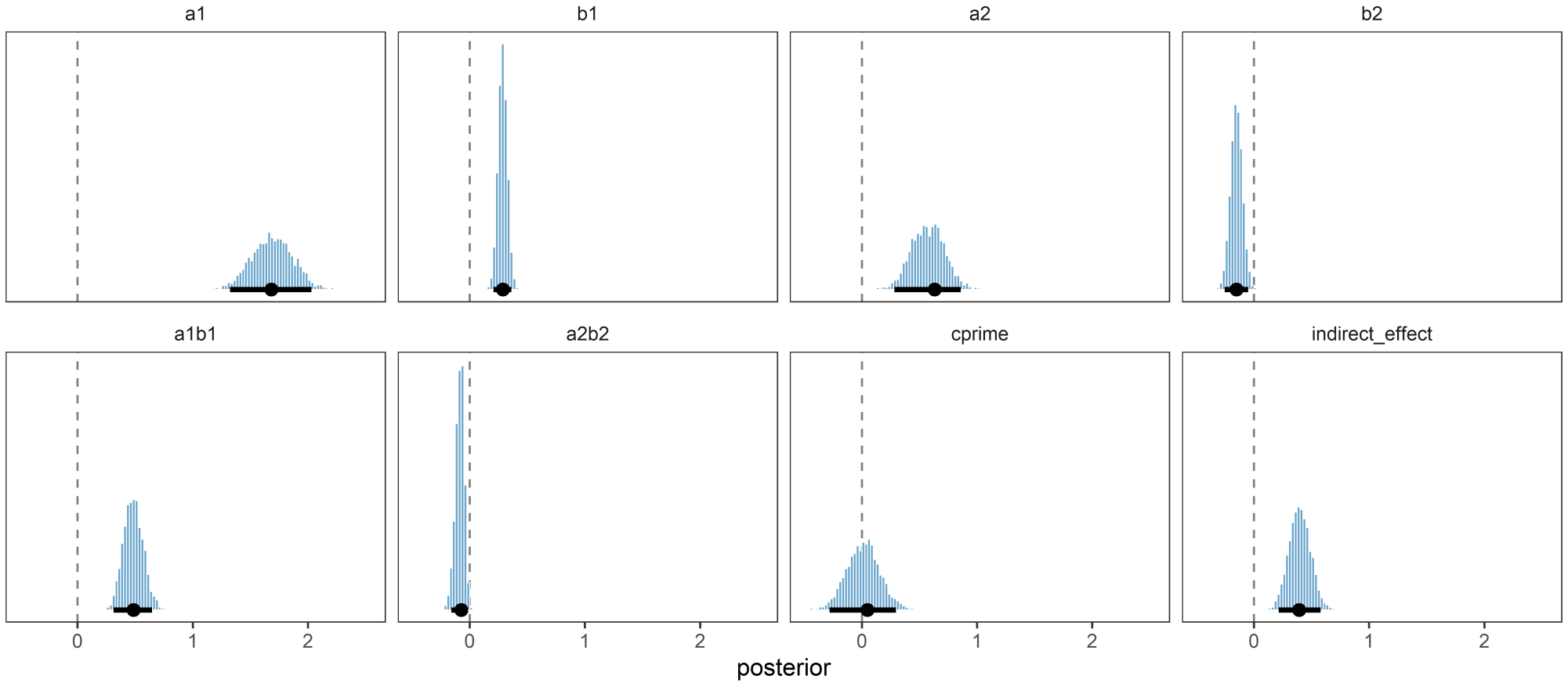
Support for Research on Companion Robots. We specified a saturated model (Figure 5a). Nostalgia positively predicted social connectedness ($b = 1.69$, 95% CI [1.33, 2.05], $SE = 0.18$, $p < .001$, $z = 9.17$, $b^* = .47$), which in turn positively predicted support for research on companion robots ($b = 0.29$, 95% CI [0.07, 0.31], $SE = 0.04$, $z = 7.25$, $p < .001$, $b^* = .42$). At the same time, nostalgia positively predicted skepticism about change ($b = 0.58$, 95% CI [0.29, 0.86], $SE = 0.14$, $z = 4.00$, $p < .001$, $b^* = .23$), which in turn negatively predicted support for research on companion robots ($b = –0.15$, 95% CI [–0.40, –0.20], $SE = 0.05$, $z = –3.01$, $p = .003$, $b^* = –.16$). The indirect effects via social connectedness ($ab = 0.48$, 95% CI [0.35. 0.66]) and skepticism about change ($ab = –0.09$, 95% CI [–0.18, –0.02]) were significant. When controlling for these directionally opposite indirect effects, the direct effect of nostalgia on support for research on companion robots ($b = 0.01$, 95 CI [–0.20, 0.28], $SE = 0.15$, $z = 0.09$, $p = .927$, $b^* = .01$) was not statistically significant.

We also tested the tenability of an equality constraint on the absolute magnitude of the respective indirect effects via social

```
draws <- as_draws_df(mod)

draws %>%
  transmute(
    a1      = b_Socialconnect_Mnos,
    a2      = b_Skepticism_Mnos,
    cprime  = b_Supportrobot_Mnos,
    b1      = b_Supportrobot_Social_connect,
    b2      = b_Supportrobot_Skepticism
  ) %>%
  mutate(
    a1b1            = a1 * b1,
    a2b2            = a2 * b2,
    indirect_effect = a1 * b1 + a2 * b2
  ) %>%
  pivot_longer(
    cols          = everything(),
    names_to      = "item",
    values_to     = "value"
  ) %>%
  group_by(item) %>%
  ggdist::mean_hdi(.width = .95)
```

item	value	.lower	.upper	.width	.point	.interval
a1	1.692	1.323	2.031	0.950	mean	hdi
b1	0.286	0.207	0.362	0.950	mean	hdi
a2	0.575	0.282	0.858	0.950	mean	hdi
b2	-0.152	-0.253	-0.052	0.950	mean	hdi
a1b1	0.484	0.313	0.647	0.950	mean	hdi
a2b2	-0.087	-0.160	-0.014	0.950	mean	hdi
cprime	0.012	-0.280	0.295	0.950	mean	hdi
indirect_effect	0.397	0.215	0.578	0.950	mean	hdi

Bayesian interpretation



标准化后的结果

Support for Research on Companion Robots. We specified a saturated model (Figure 5a). Nostalgia positively predicted social connectedness ($b = 1.69$, 95% CI [1.33, 2.05], $SE = 0.18$, $p < .001$, $z = 9.17$, $b^* = .47$), which in turn positively predicted support for research on companion robots ($b = 0.29$, 95% CI [0.07, 0.31], $SE = 0.04$, $z = 7.25$, $p < .001$, $b^* = .42$). At the same time, nostalgia positively predicted skepticism about change ($b = 0.58$, 95% CI [0.29, 0.86], $SE = 0.14$, $z = 4.00$, $p < .001$, $b^* = .23$), which in turn negatively predicted support for research on companion robots ($b = –0.15$, 95% CI [–0.40, –0.20], $SE = 0.05$, $z = –3.01$, $p = .003$, $b^* = –.16$). The indirect effects via social connectedness ($ab = 0.48$, 95% CI [0.35. 0.66]) and skepticism about change ($ab = –0.09$, 95% CI [–0.18, –0.02]) were significant. When controlling for these directionally opposite indirect effects, the direct effect of nostalgia on support for research on companion robots ($b = 0.01$, 95 CI [–0.20, 0.28], $SE = 0.15$, $z = 0.09$, $p = .927$, $b^* = .01$) was not statistically significant.

We also tested the tenability of an equality constraint on the absolute magnitude of the respective indirect effects via social

标准化后的结果

Support for Research on Companion Robots. We specified a saturated model (Figure 5a). Nostalgia positively predicted social connectedness ($b = 1.69$, 95% CI [1.33, 2.05], $SE = 0.18$, $p < .001$, $z = 9.17$, $b^* = .47$), which in turn positively predicted support for research on companion robots ($b = 0.29$, 95% CI [0.07, 0.31], $SE = 0.04$, $z = 7.25$, $p < .001$, $b^* = .42$). At the same time, nostalgia positively predicted skepticism about change ($b = 0.58$, 95% CI [0.29, 0.86], $SE = 0.14$, $z = 4.00$, $p < .001$, $b^* = .23$), which in turn negatively predicted support for research on companion robots ($b = –0.15$, 95% CI [–0.40, –0.20], $SE = 0.05$, $z = –3.01$, $p = .003$, $b^* = –.16$). The indirect effects via social connectedness ($ab = 0.48$, 95% CI [0.35. 0.66]) and skepticism about change ($ab = –0.09$, 95% CI [–0.18, –0.02]) were significant. When controlling for these directionally opposite indirect effects, the direct effect of nostalgia on support for research on companion robots ($b = 0.01$, 95 CI [–0.20, 0.28], $SE = 0.15$, $z = 0.09$, $p = .927$, $b^* = .01$) was not statistically significant.

We also tested the tenability of an equality constraint on the absolute magnitude of the respective indirect effects via social

```r
standardize <- function(x) {
  (x - mean(x)) / sd(x)
}

d_s <- d %>%
  mutate(across(everything(), standardize))


mod_s <- brm(
  bf(Social_connect ~ Mnos) +
    bf(Skepticism ~ Mnos) +
    bf(Support_robot ~ Mnos + Social_connect + Skepticism) +
    set_rescor(FALSE),

  family = gaussian,
  data   = d_s,
  chains = 4,
  cores  = 4
)
```

标准化后的结果

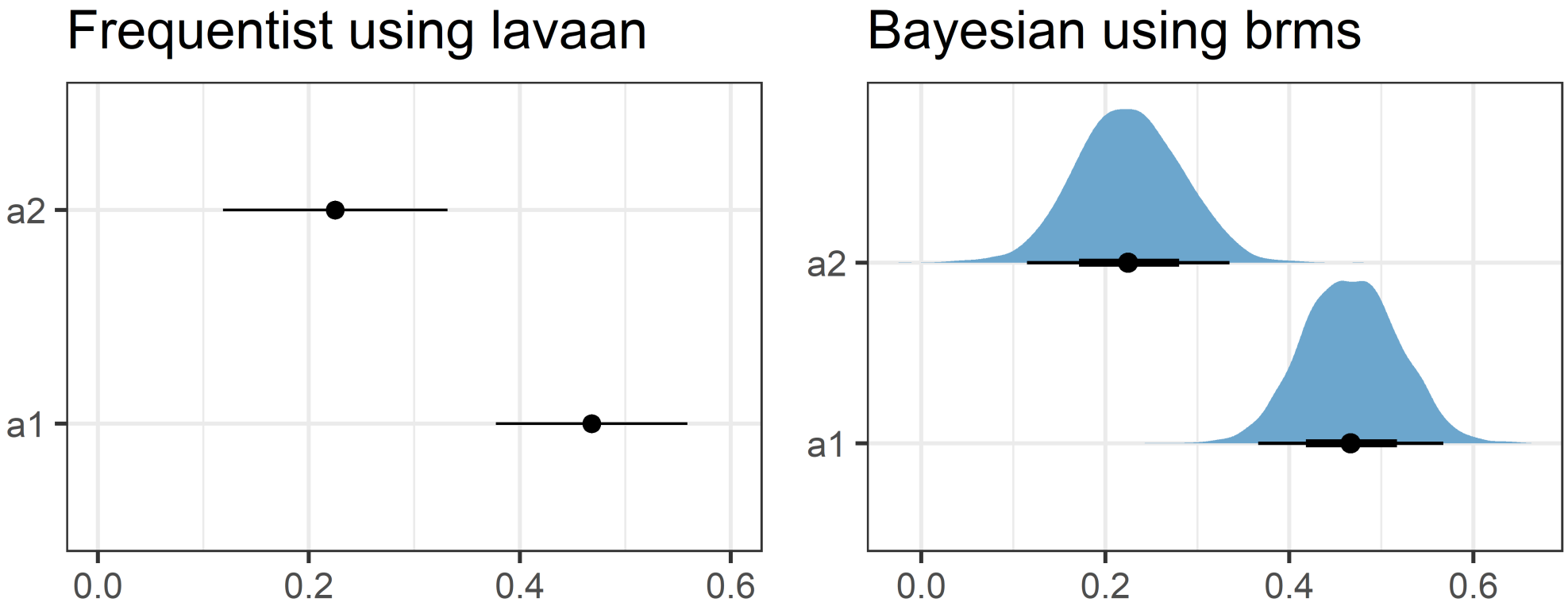
Support for Research on Companion Robots. We specified a saturated model (Figure 5a). Nostalgia positively predicted social connectedness ($b = 1.69$, 95% CI [1.33, 2.05], $SE = 0.18$, $p < .001$, $z = 9.17$, $b^* = .47$), which in turn positively predicted support for research on companion robots ($b = 0.29$, 95% CI [0.07, 0.31], $SE = 0.04$, $z = 7.25$, $p < .001$, $b^* = .42$). At the same time, nostalgia positively predicted skepticism about change ($b = 0.58$, 95% CI [0.29, 0.86], $SE = 0.14$, $z = 4.00$, $p < .001$, $b^* = .23$), which in turn negatively predicted support for research on companion robots ($b = –0.15$, 95% CI [–0.40, –0.20], $SE = 0.05$, $z = –3.01$, $p = .003$, $b^* = –.16$). The indirect effects via social connectedness ($ab = 0.48$, 95% CI [0.35. 0.66]) and skepticism about change ($ab = –0.09$, 95% CI [–0.18, –0.02]) were significant. When controlling for these directionally opposite indirect effects, the direct effect of nostalgia on support for research on companion robots ($b = 0.01$, 95 CI [–0.20, 0.28], $SE = 0.15$, $z = 0.09$, $p = .927$, $b^* = .01$) was not statistically significant.

We also tested the tenability of an equality constraint on the absolute magnitude of the respective indirect effects via social

```r
draws <- as_draws_df(mod_s)

draws %>%
  transmute(
    a1      = b_Socialconnect_Mnos,
    a2      = b_Skepticism_Mnos,
    cprime  = b_Supportrobot_Mnos,
    b1      = b_Supportrobot_Social_connect,
    b2      = b_Supportrobot_Skepticism
  ) %>%
  mutate(
    a1b1            = a1 * b1,
    a2b2            = a2 * b2,
    indirect_effect = a1 * b1 + a2 * b2
  ) %>%
  pivot_longer(
    cols          = everything(),
    names_to      = "item",
    values_to     = "value"
  ) %>%
  group_by(item) %>%
  ggdist::mean_hdi(.width = .95)
```

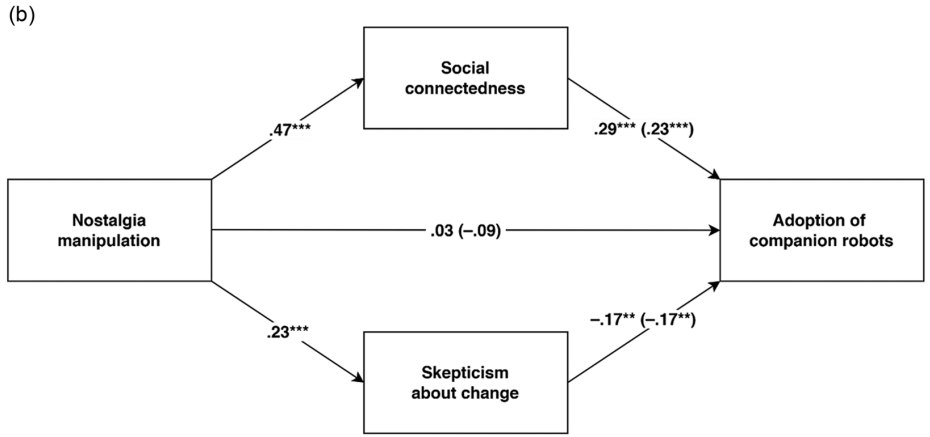
item	value	.lower	.upper	.width	.point	.interval
a1	0.467	0.373	0.574	0.950	mean	hdi
b1	0.423	0.297	0.532	0.950	mean	hdi
a2	0.225	0.123	0.341	0.950	mean	hdi
b2	-0.160	-0.266	-0.057	0.950	mean	hdi
a1b1	0.198	0.128	0.268	0.950	mean	hdi
a2b2	-0.036	-0.066	-0.008	0.950	mean	hdi
cprime	0.007	-0.106	0.124	0.950	mean	hdi
indirect_effect	0.162	0.088	0.241	0.950	mean	hdi

对比


Frequentist using lavaan
a2
a1
0.0
0.2
0.4
0.6
Bayesian using brms
a2
a1
0.0
0.2
0.4
0.6

练习题

Figure 5b


(b)
Social connectedness
.47***
.29*** (.23***)
Nostalgia manipulation
.03 (−.09)
Adoption of companion robots
.23***
−.17** (−.17**)
Skepticism about change

Study 5b

Adoption of Companion Robots. We conducted a mediation analysis on adoption of companion robots using Mplus 7.0. We specified a saturated model (Figure 5b). Nostalgia enhanced social connectedness ($b = 1.69$, 95% CI [1.33, 2.05], $SE = 0.18$, $z = 9.17$, $p < .001$, $b^* = .47$), which in turn positively predicted companion robot adoption ($b = 0.27$, 95% CI [0.17, 0.36], $SE = 0.05$, $z = 5.58$, $p < .001$, $b^* = .23$). At the same time, nostalgia enhanced skepticism about change ($b = 0.58$, 95% CI [0.29, 0.86], $SE = 0.14$, $z = 4.00$, $p < .001$, $b^* = .23$), which in turn negatively predicted companion robot adoption ($b = –0.19$, 95% CI [–0.31, –0.07], $SE = 0.06$, $z = –3.04$, $p = .002$, $b^* = –.17$). The indirect effects via social connectedness ($ab = 0.45$, 95% CI [0.29. 0.65]) and skepticism about change ($ab = –0.11$, 95% CI [–0.21, –0.04]) were significant. When controlling for these directionally opposite indirect effects, the direct effect of nostalgia on companion robot adoption ($b = –0.25$, 95 CI [–0.60, 0.10], $SE = 0.18$, $z = –1.41$, $p = .157$, $b^* = –.09$) was not statistically significant.

感谢 R 和 Stan 语言之美!

本幻灯片由 R 包 **xaringan** 和 **flipbookr** 生成