情商和自私如何影响消费者欺诈的发生

论文复现

王敏杰

2023-11-10

复现代码

https://github.com/perlatex/replicate_paper_Consumer_Fraud

我们的目标论文

JOURNAL ARTICLE

Your Cheatin' Heart: How Emotional Intelligence and Selfishness Impact the Incidence of Consumer Fraud

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Jonathan Hasford ✉, Blair Kidwell, David M Hardesty, Adam Farmer

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论文研究了5个主题

- STUDY 1
- STUDY 2
- STUDY 3
- STUDY 4
- STUDY 5A
- STUDY 5B AND 5C

我们先关注Study 1

- **STUDY 1**
- STUDY 2
- STUDY 3
- STUDY 4
- STUDY 5A
- STUDY 5B AND 5C

Study 1

```
library(tidyverse)

d <- haven::read_sav("./data/Study 1.sav")
```

SelfManip	CoinFlip2	ZEI	Age	Gender
1	0	-2.69	16	1
1	0	-2.25	21	2
1	0	-1.73	32	1
1	0	-1.48	23	2
1	0	-1.26	20	2
1	1	-1.20	20	2

- **SelfManip** : selfishness manipulation(1 = high, -1 = low)
- **ZEI** : Standardized EI scores
- **CoinFlip2** : whether participants lied(1 =lied, 0 = not lie)

Results

We first analyzed whether our selfishness manipulation impacted participant EI scores. Standardized EI scores were lower in the high selfishness condition ($M = -0.19$) than the low selfishness condition ($M = 0.19$, $t(177) = 2.67$, $p = .009$). Given this effect, we test for potential multicollinearity in all subsequent analyses.

Logistic regression was conducted with EI, selfishness (1 = high, −1 = low), and their interaction predicting whether participants lied for a chance to win the gift card (1 = lied, 0 = did not lie). Multicollinearity was shown to not be an issue (VIFs < 1.05). The main effects of selfishness (log odds $= .01$, $p = .97$) and EI (log odds $= .17$, $p = .40$) were nonsignificant. However, as theorized the interaction of EI and selfishness was significant (log odds $= .53$, $p = .01$). The effect size associated with the EI by selfishness interaction was $f^2 = .07$ (see Dawson 2014), which is characterized as a small effect.

To analyze the EI × selfishness interaction, we used PROCESS model 1 (Hayes 2017). Results are displayed in figure 1. In the low selfishness condition there is a nonsignificant relationship between EI and fraud (log odds $= -.36$, $z = -1.40$, $p = .16$). In the high selfishness condition, there is a significant positive relationship between EI and fraud (log odds $= .70$, $z = 2.17$, $p = .03$). These results support hypothesis 1.

Additionally, we performed a *post-hoc* power analysis using G*Power (Faul et al. 2007) to ensure adequate statis-

```
d %>%
  group_by(SelfManip) %>%
  summarise(
    M = mean(ZEI)
  )
```

SelfManip	M
-1	-0.195
1	0.197

```
d %>%
  mutate(
    SelfManip = factor(SelfManip,
      level = c(1, -1)
    )
  ) %>%
  rstatix::t_test(ZEI ~ SelfManip)
```

.y.	group1	group2	n1	n2	statistic	df	p
ZEI	1	-1	89	90	2.67	176	0.00829

Results

We first analyzed whether our selfishness manipulation impacted participant EI scores. Standardized EI scores were lower in the high selfishness condition ($M = -0.19$) than the low selfishness condition ($M = 0.19$, $t(177) = 2.67$, $p = .009$). Given this effect, we test for potential multicollinearity in all subsequent analyses.

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```
mod <- glm(
  CoinFlip2 ~ SelfManip * ZEI,
  data   = d,
  family = binomial(link = "logit")
)

mod %>%
  gtsummary::tbl_regression()
```

Characteristic	log(OR)[1]	95% CI[1]	p-value
SelfManip	0.01	-0.42, 0.43	>0.9
Zscore(EI)	0.17	-0.22, 0.59	0.4
SelfManip * Zscore(EI)	0.53	0.14, 0.95	0.010

[1] OR = Odds Ratio, CI = Confidence Interval

Results

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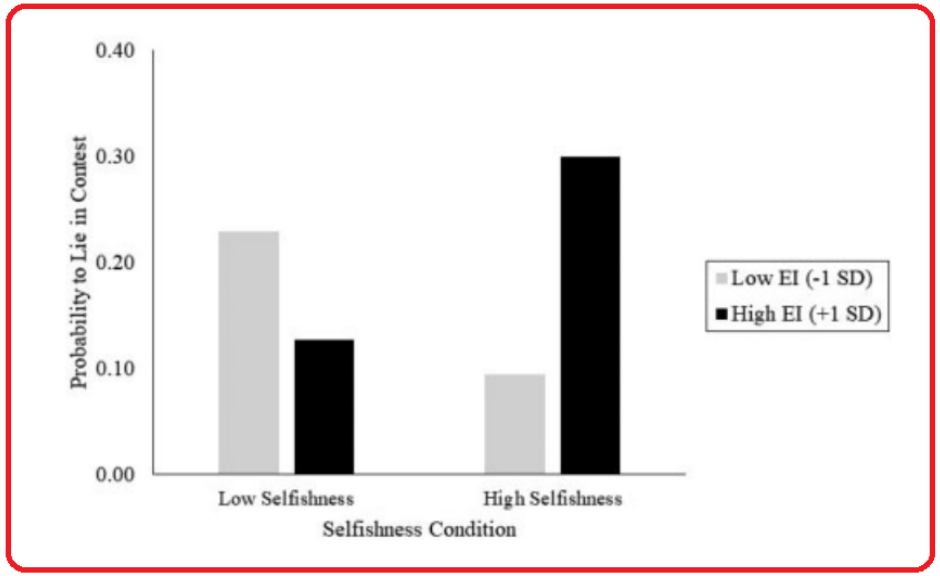
FIGURE 1

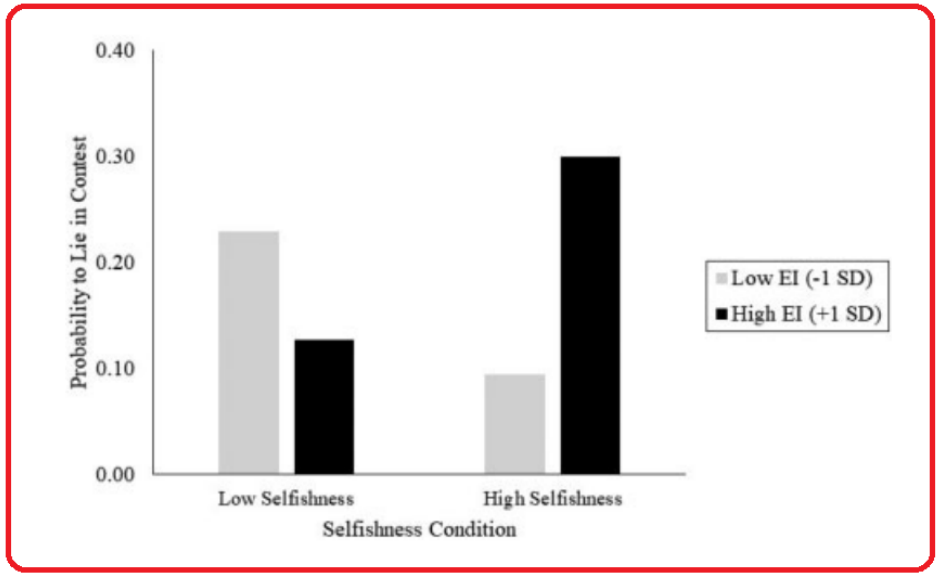
STUDY 1 RESULTS



suggest that EI and selfishness scores were not related in such a way that impacted our observed effects. To ensure that any causal effects of our selfishness manipulation on EI or the correlation of EI and selfishness did not impact our findings, we examine the VIFs in all subsequent studies to ensure no multicollinearity effects are present.

FIGURE 1

STUDY 1 RESULTS



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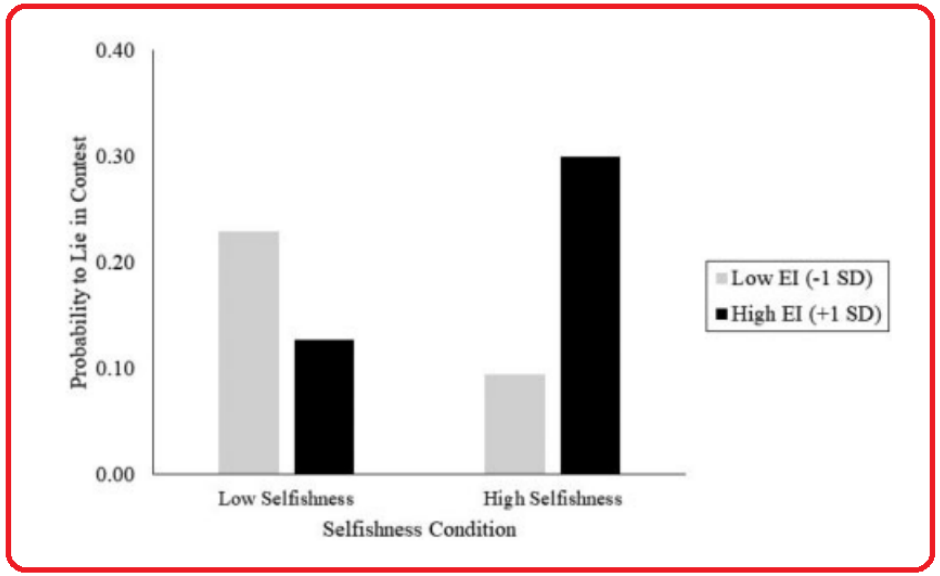
```
library(marginaleffects)
mod %>%
  marginaleffects::predictions(
    newdata = datagrid(SelfManip = c(-1, 1),
                       ZEI       = c(-1, 1)),
    type    = "response"
  ) %>%
  as_tibble()
```

rowid	estimate	statistic	conf.low	conf.high	SelfManip	ZEI
1	0.2295	4.19	0.1222	0.337	-1	-1
2	0.1273	2.53	0.0286	0.226	-1	1
3	0.0947	2.00	0.0020	0.187	1	-1
4	0.2992	4.55	0.1703	0.428	1	1

FIGURE 1

STUDY 1 RESULTS



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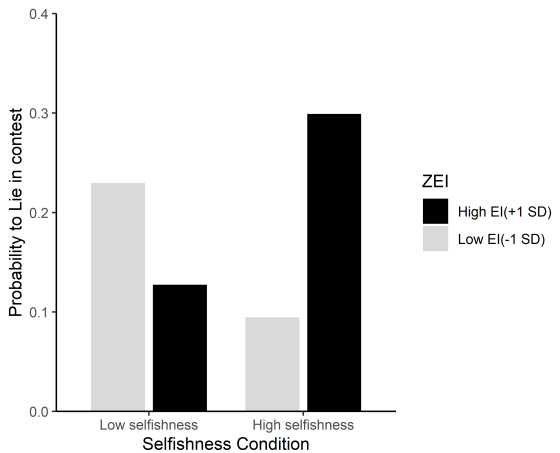
```r
library(marginaleffects)
mod %>%
  marginaleffects::predictions(
    newdata = datagrid(SelfManip = c(-1, 1),
                       ZEI       = c(-1, 1)),
    type    = "response"
  ) %>%
  as_tibble() %>%
  mutate(
    across(c(SelfManip, ZEI), as.factor)
  ) %>%
  ggplot(aes(x = SelfManip, y = estimate)) +
  geom_col(aes(fill = ZEI),
    position = position_dodge(width = 0.8)
  )
```



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Logistic regression was conducted with EI, selfishness (1 = high, −1 = low), and their interaction predicting whether participants lied for a chance to win the gift card (1 = lied, 0 = did not lie). Multicollinearity was shown to not be an issue (VIFs < 1.05). The main effects of selfishness (log odds $= .01$, $p = .97$) and EI (log odds $= .17$, $p = .40$) were nonsignificant. However, as theorized the interaction of EI and selfishness was significant (log odds $= .53$, $p = .01$). The effect size associated with the EI by selfishness interaction was $f^2 = .07$ (see Dawson 2014), which is characterized as a small effect.

To analyze the EI × selfishness interaction, we used PROCESS model 1 (Hayes 2017). Results are displayed in figure 1. In the low selfishness condition there is a nonsignificant relationship between EI and fraud (log odds $= -.36$, $z = -1.40$, $p = .16$). In the high selfishness condition, there is a significant positive relationship between EI and fraud (log odds $= .70$, $z = 2.17$, $p = .03$). These results support hypothesis 1.

Additionally, we performed a *post-hoc* power analysis using G*Power (Faul et al. 2007) to ensure adequate statis-

```
mod %>%
  marginaleffects::slopes(
    variables = "ZEI",
    by        = "SelfManip",
    type      = "link"
  ) %>%
  as_tibble()
```

term	contrast	SelfManip	estimate	std.error	statistic	p.value
ZEI	mean(dY/dX)	-1	-0.357	0.255	-1.40	0.1611
ZEI	mean(dY/dX)	1	0.703	0.324	2.17	0.0297

我们接着看Study 2

- STUDY 1
- **STUDY 2**
- STUDY 3
- STUDY 4
- STUDY 5A
- STUDY 5B AND 5C

Study 2

```
library(tidyverse)

d <- haven::read_sav("./data/Study 2.sav")
```

Fraud	ZSelfish	ZEI
0	0.163	-2.06
0	-0.834	-1.15
0	-0.585	-2.37
0	0.412	-2.06
0	1.659	-1.90
0	1.409	-2.39

- **ZSelfish** : selfishness manipulation(1 =high, 1 = low)
- **ZEI** : Standardized EI scores
- **Fraud** : whether participants stole(1 = yes, 0 = no)

Results

A logistic regression was conducted with EI, selfishness, and their interaction predicting whether participants stole the deluxe pen (1 = yes, 0 = no). EI and selfishness were negatively correlated ($r = -.10$, $p = .046$), but multicollinearity was not an issue (VIFs < 1.03). The main effect of selfishness was significant (log odds $= .36$, $Z = 2.25$, $p = .024$), while the main effect of EI was not (log odds $= .07$, $Z = 0.41$, $p = .68$). These effects were qualified by the significant interaction of selfishness and EI (log odds $= .40$, $Z = 2.35$, $p = .019$). The effect size associated with the interaction was $f^2 = .03$, which is characterized as a small effect (Dawson 2014).

To analyze the EI × selfishness interaction displayed in figure 2, we conducted a floodlight analysis (Spiller et al. 2013) using PROCESS model 1 (Hayes 2017). Johnson–Neyman points (Johnson and Neyman 1936) of 0.80 and −2.41 were observed. For participants with a selfishness score of 0.80 SD above the mean and higher (18.9% of participants), those with high EI were significantly more likely to commit fraud relative to those with low EI. Participants with a selfishness score of −2.41 SD below the mean and less (1.1% of participants) were also more likely to commit fraud in the low (vs. high) EI condition.

Finally, we performed a *post-hoc* power analysis using G*Power (Faul et al. 2007) to ensure adequate statistical power in our study. Based on our observed interaction effect and sample size, the statistical power of .80 was

```
cor(d$ZEI, d$ZSelfish)
```

```
## [1] -0.102
```

```
d %>%
  rstatix::cor_test(vars = c(ZEI, ZSelfish))
```

var1	var2	cor	statistic	p	conf.low	conf.high	method
ZEI	ZSelfish	-0.1	-1.98	0.0485	-0.201	-0.000712	Pearson

Results

A logistic regression was conducted with EI, selfishness, and their interaction predicting whether participants stole the deluxe pen (1 = yes, 0 = no). EI and selfishness were negatively correlated ($r = -.10$, $p = .046$), but multicollinearity was not an issue (VIFs < 1.03). The main effect of selfishness was significant (log odds = .36, $Z = 2.25$, $p = .024$), while the main effect of EI was not (log odds = .07, $Z = 0.41$, $p = .68$). These effects were qualified by the significant interaction of selfishness and EI (log odds = .40, $Z = 2.35$, $p = .019$). The effect size associated with the interaction was $f^2 = .03$, which is characterized as a small effect (Dawson 2014).

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Finally, we performed a *post-hoc* power analysis using G*Power (Faul et al. 2007) to ensure adequate statistical power in our study. Based on our observed interaction ef-

```
mod <- glm(
  Fraud ~ ZSelfish * ZEI,
  data = d,
  family = binomial(link = "logit")
)

mod %>%
  gtsummary::tbl_regression()
```

Characteristic	log(OR)[1]	95% CI[1]	p-value
Zscore(Selfish)	0.36	0.05, 0.67	0.025
Zscore(EI)	0.07	-0.24, 0.40	0.6
Zscore(Selfish) * Zscore(EI)	0.40	0.08, 0.75	0.019

[1] OR = Odds Ratio, CI = Confidence Interval

Results

A logistic regression was conducted with EI, selfishness, and their interaction predicting whether participants stole the deluxe pen (1 = yes, 0 = no). EI and selfishness were negatively correlated ($r = -.10$, $p = .046$), but multicollinearity was not an issue (VIFs < 1.03). The main effect of selfishness was significant (log odds = .36, $Z = 2.25$, $p = .024$), while the main effect of EI was not (log odds = .07, $Z = 0.41$, $p = .68$). These effects were qualified by the significant interaction of selfishness and EI (log odds = .40, $Z = 2.35$, $p = .019$). The effect size associated with the interaction was $f^2 = .03$, which is characterized as a small effect (Dawson 2014).

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FIGURE 2

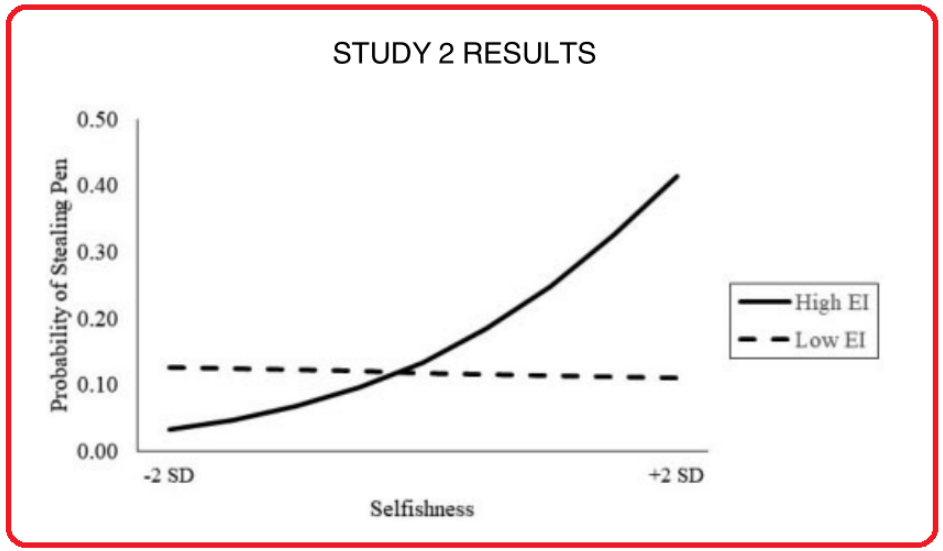
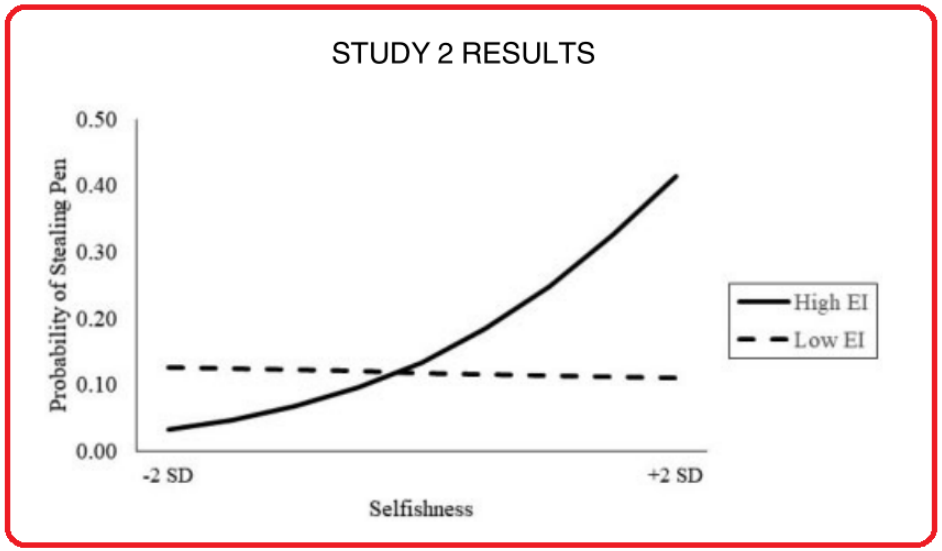


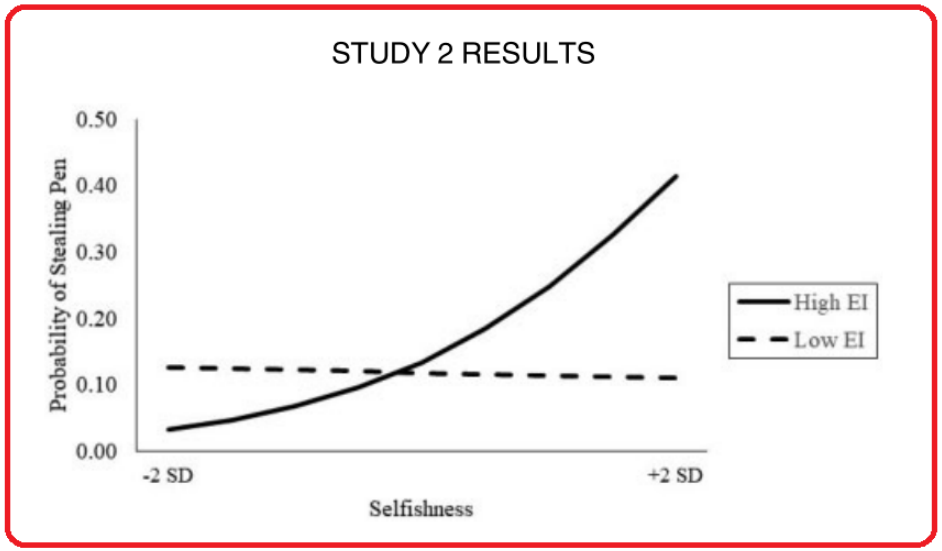
FIGURE 2



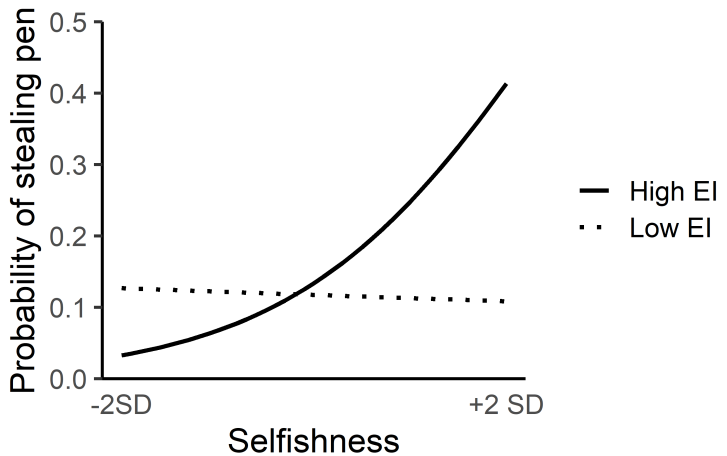

```
library(marginaleffects)
mod %>%
  marginaleffects::predictions(
    newdata = datagrid(
      ZSelfish = seq(-2, 2, by = 0.1),
      ZEI      = c(-1, 1) ),
    type    = "response"
  ) %>%
  as_tibble()
```

rowid	estimate	statistic	conf.low	conf.high	ZSelfish	ZEI
1	0.1269	2.26	0.016675	0.2372	-2.0	-1
2	0.0328	1.77	-0.003494	0.0691	-2.0	1
3	0.1265	2.35	0.020839	0.2321	-1.9	-1
4	0.0353	1.85	-0.002156	0.0728	-1.9	1
5	0.1260	2.44	0.024927	0.2270	-1.8	-1
6	0.0380	1.93	-0.000606	0.0766	-1.8	1
7	0.1255	2.55	0.028933	0.2221	-1.7	-1
8	0.0408	2.02	0.001176	0.0805	-1.7	1

FIGURE 2




```
library(marginaleffects)
mod %>%
  marginaleffects::predictions(
    newdata = datagrid(
      ZSelfish = seq(-2, 2, by = 0.1),
      ZEI      = c(-1, 1) ),
    type    = "response"
  ) %>%
  as_tibble() %>%
  mutate(across(ZEI, as.factor)) %>%
  ggplot(aes(x = ZSelfish, y = estimate,
      group = ZEI) ) +
  geom_line(aes(linetype = ZEI),
      linewidth = 1)
```



我们接着看Study 3

- STUDY 1
- STUDY 2
- **STUDY 3**
- STUDY 4
- STUDY 5A
- STUDY 5B AND 5C

Study 3

```
library(tidyverse)

d <- haven::read_sav("./data/Study 3.sav")
```

Cond	PriceTag	GSR	CEISStd	SelfCks
1	4	0.0413	-0.45842	4.25
1	1	0.7128	-0.16171	3.25
-1	5	0.5172	-0.82932	1.00
-1	5	0.5130	-0.00194	1.00
-1	5	0.2338	1.49875	1.50
-1	1	0.3294	0.16924	1.50

- **Cond** : Selfishness (1 =high, -1 = low)
- **PriceTag** : Willingness to switch price Tag
- **GSR** : Physiological Arousal
- **CEISStd** : emotional intelligence
- **SelfCks** : selfishness manipulation check

Results

First, the selfishness manipulation was examined with the four-item manipulation check. A *t*-test revealed that participants reported greater selfishness in the high selfishness condition ($n = 105$, $M = 4.10$, SD = .95) relative to participants in the low selfishness condition ($n = 105$, $M = 2.61$, SD = 1.08, $t(208) = 10.56$, $p < .001$).

The interaction between selfishness and EI on the propensity to commit fraud was examined through regression. Multicollinearity was shown to not be an issue (VIFs $<$ 1.07). Both main effects of selfishness ($b = .03$, $t = 0.19$, $p = .85$) and EI ($b = .03$, $t = 0.17$, $p = .87$) were nonsignificant. However, the interaction of selfishness and EI was significant ($b = .36$, $t = 2.34$, $p = .02$). The effect size associated with the interaction was $f^2 = .03$, which is characterized as a small effect (Dawson 2014). Results are displayed in figure 3. In the low selfishness condition there is a nonsignificant relationship between EI and fraud ($b = -.33$, $z = -1.41$, $p = .16$). In the high selfishness condition, there is a significant positive relationship between EI and fraud ($b = .38$, $z = 1.96$, $p = .05$). These findings support hypothesis 1.

Recall that embarrassment is predicted to mediate the relationship between the interaction of EI and selfishness onto consumer fraud. Here, embarrassment was approximated through GSR. SCRs were collected beginning when participants were exposed to the consumer fraud scenario and ended five seconds after they completed the task to account for any potential delays from stimulus assessment to

```
d %>%
  group_by(Cond) %>%
  summarise(
    n  = n(),
    M  = mean(SelfCks),
    SD = sd(SelfCks)
  )
```

Cond	n	M	SD
-1	105	2.61	1.081
1	105	4.10	0.953

```
d %>%
  mutate(
    Cond = factor(Cond,
      level = c(1, -1)
    )
  ) %>%
  rstatix::t_test(SelfCks ~ Cond)
```

.y.	group1	group2	n1	n2	statistic	df	p
SelfCks	1	-1	105	105	10.562	204.761	0.000

Results

First, the selfishness manipulation was examined with the four-item manipulation check. A *t*-test revealed that participants reported greater selfishness in the high selfishness condition ($n = 105$, $M = 4.10$, SD = .95) relative to participants in the low selfishness condition ($n = 105$, $M = 2.61$, SD = 1.08, $t(208) = 10.56$, $p < .001$).

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```
mod <- lm(
  PriceTag ~ Cond + CEISStd + Cond:CEISStd,
  data = d
)

mod %>%
  gtsummary::tbl_regression()
```

Characteristic	Beta	[1]">95% CI[1]	p-value
Cond	0.03	-0.27, 0.32	0.8
CEISStd	0.03	-0.27, 0.33	0.9
Cond * CEISStd	0.36	0.06, 0.66	0.020

[1] CI = Confidence Interval

Results

First, the selfishness manipulation was examined with the four-item manipulation check. A *t*-test revealed that participants reported greater selfishness in the high selfishness condition ($n = 105$, $M = 4.10$, SD = .95) relative to participants in the low selfishness condition ($n = 105$, $M = 2.61$, SD = 1.08, $t(208) = 10.56$, $p < .001$).

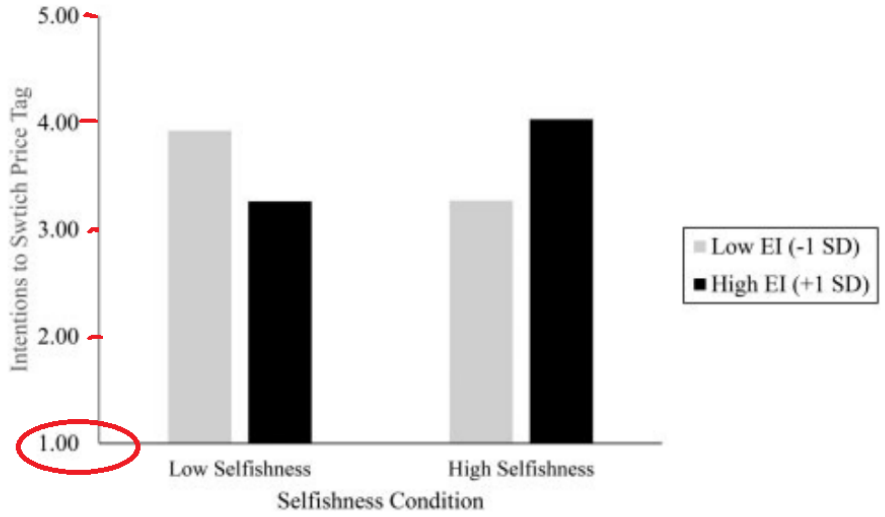
The interaction between selfishness and EI on the propensity to commit fraud was examined through regression. Multicollinearity was shown to not be an issue (VIFs < 1.07). Both main effects of selfishness ($b = .03$, $t = 0.19$, $p = .85$) and EI ($b = .03$, $t = 0.17$, $p = .87$) were nonsignificant. However, the interaction of selfishness and EI was significant ($b = .36$, $t = 2.34$, $p = .02$). The effect size associated with the interaction was $f^2 = .03$, which is characterized as a small effect (Dawson 2014). Results are displayed in figure 3. In the low selfishness condition there is a nonsignificant relationship between EI and fraud ($b = -.33$, $z = -1.41$, $p = .16$). In the high selfishness condition, there is a significant positive relationship between EI and fraud ($b = .38$, $z = 1.96$, $p = .05$). These findings support hypothesis 1.

Recall that embarrassment is predicted to mediate the relationship between the interaction of EI and selfishness onto consumer fraud. Here, embarrassment was approximated through GSR. SCRs were collected beginning when participants were exposed to the consumer fraud scenario and ended five seconds after they completed the task to ac-

FIGURE 3

坐标轴要有刻度

STUDY 3 RESULTS

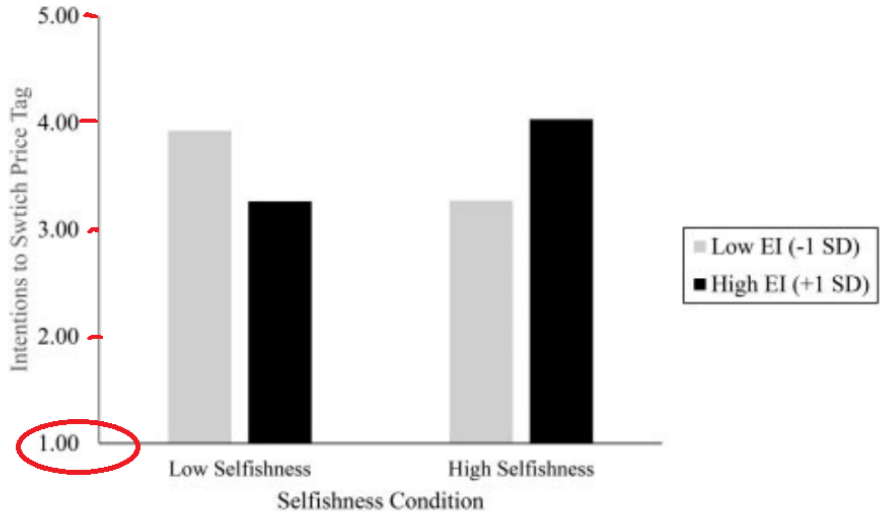


柱状图要从0开始

FIGURE 3

坐标轴要有刻度

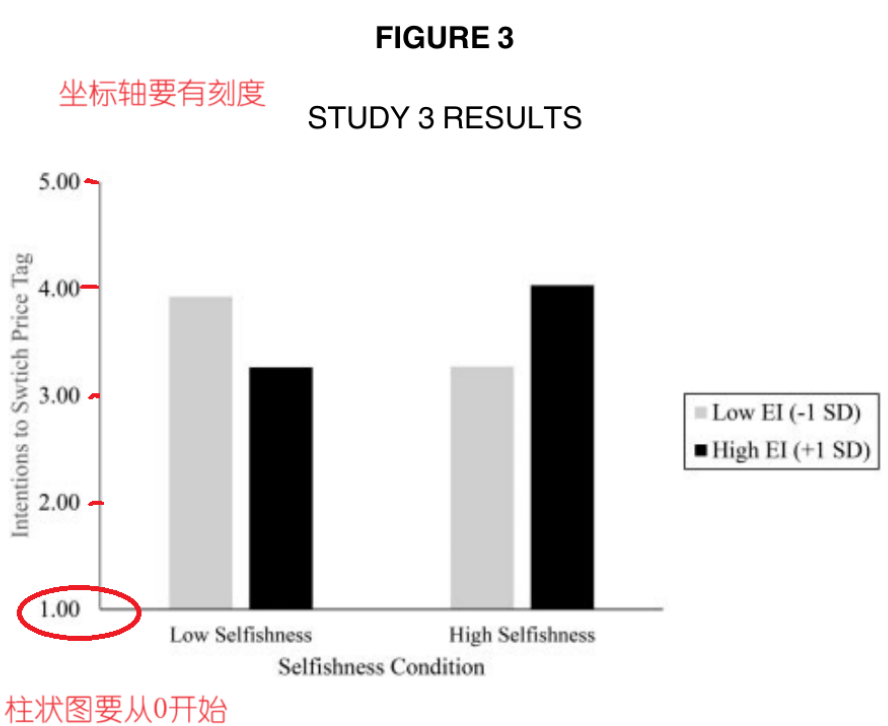
STUDY 3 RESULTS



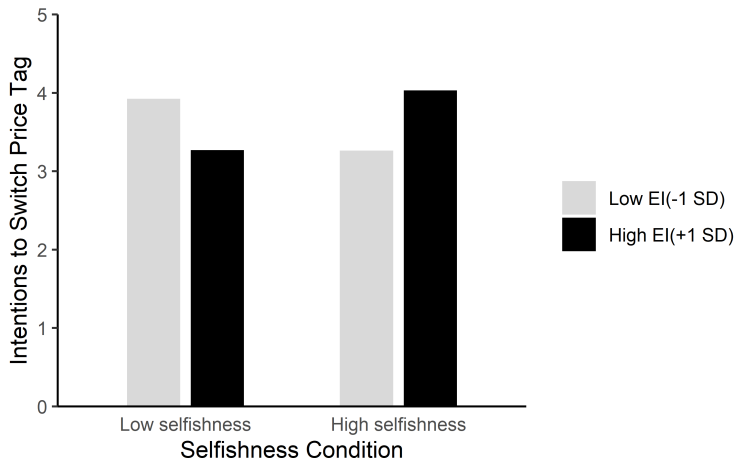
柱状图要从0开始

```
library(marginaleffects)
mod %>%
  marginaleffects::predictions(
    newdata = datagrid(Cond    = c(-1, 1),
                       CEISStd = c(-1, 1))
  ) %>%
  as_tibble()
```

rowid	estimate	statistic	conf.low	conf.high	Cond	CEISStd
1	3.93	11.3	3.25	4.61	-1	-1
2	3.26	11.6	2.71	3.82	-1	1
3	3.27	12.6	2.76	3.78	1	-1
4	4.03	13.0	3.43	4.64	1	1




```r
library(marginaleffects)
mod %>%
  marginaleffects::predictions(
    newdata = datagrid(Cond    = c(-1, 1),
                       CEISStd = c(-1, 1))
  ) %>%
  as_tibble() %>%
  mutate(
    across(c(Cond, CEISStd), as.factor)
  ) %>%
  ggplot(aes(x = CEISStd, y = estimate)) +
  geom_col(
    aes(fill = Cond),
    position = position_dodge(width = 0.6),
    width = 0.5
  )
```



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Recall that embarrassment is predicted to mediate the relationship between the interaction of EI and selfishness onto consumer fraud. Here, embarrassment was approximated through GSR. SCRs were collected beginning when participants were exposed to the consumer fraud scenario and ended five seconds after they completed the task to account for any potential delays from stimulus assessment to

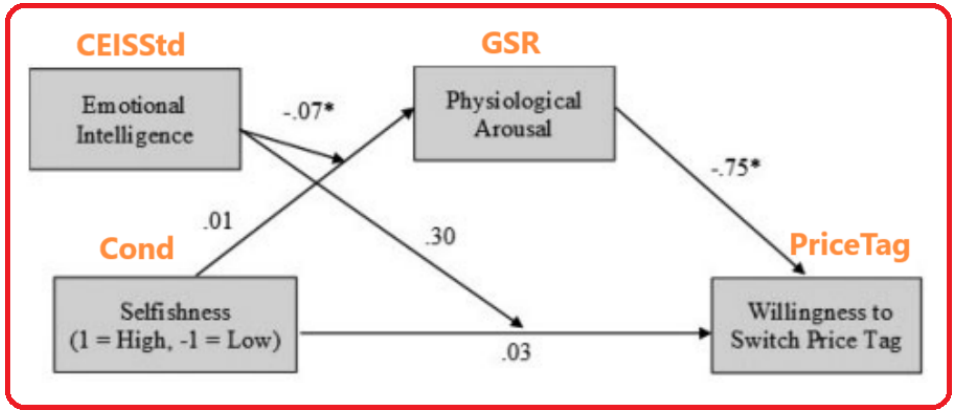
```
mod %>%
  marginaleffects::slopes(
    variables = "CEISStd",
    by        = "Cond"
  ) %>%
  as_tibble()
```

term	contrast	Cond	estimate	std.error	statistic	p.value
CEISStd	mean(dY/dX)	-1	-0.330	0.234	-1.41	0.159
CEISStd	mean(dY/dX)	1	0.381	0.194	1.96	0.050

PROCESS (Hayes 2017) Model 8 was used to estimate the predicted conditional process model where the GSR amplitude served as the mediator in our model. Here, the interaction of selfishness and EI significantly impacted physiological arousal ($b = -.07$, $t = -2.28$, $p = .02$). Both the main effect of EI ($b = -.03$, $t = -0.94$, $p = .35$) and selfishness ($b = .01$, $t = 0.29$, $p = .77$) were nonsignificant. Simple slopes analysis reveals that EI was negatively related to physiological arousal in the high selfishness condition ($b = -.10$, $t = -2.52$, $p = .01$) and unrelated in the low selfishness condition ($b = .04$, $t = 0.87$, $p = .39$). Thus, when participants were high in selfishness, increases in EI allowed them to mitigate their physiological arousal when considering whether to commit fraud.

When included in the model predicting fraud intentions, physiological arousal was significant ($b = -.75$, $t = -2.25$, $p = .03$). This suggests that an increase in physiological arousal reduces the likelihood of committing fraud. The interaction of EI and selfishness was significant ($b = .30$, $t = 1.98$, $p = .05$), while the main effects of EI ($b = .00$, $t = 0.02$, $p = .98$) and selfishness ($b = .04$, $t = 0.24$, $p = .81$) were not.

The index of moderated mediation was also significant (Effect = .1076, 95% CI: [.0052, .2384]), suggesting support for the conditional process model. An indirect effect through physiological arousal was observed for those in the high selfishness condition (Effect = .0759, 95% CI: [.0010 .1683]). However, the indirect effect of physiological arousal was nonsignificant for those in the low selfishness condition (Effect = −.0316, 95% CI: [−.1161, .0221]). Together, these results suggest that physiological arousal mediates the relationship between selfishness, EI, and fraud intentions, in support of hypothesis 2 (see figure 4).



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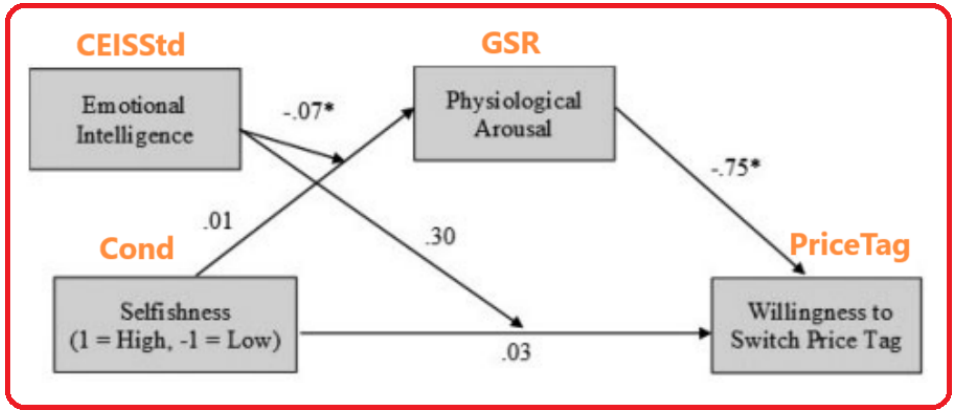


```
library(lavaan)

model <- '
  GSR      ~ a1*Cond + a2*CEISStd + a3*Cond:CEISStd
  PriceTag ~ c1*Cond + c2*CEISStd + c3*Cond:CEISStd + b*GSR

  # Index of Moderated Mediation
  IndexOfModMed := a3 * b

  # Simple Slopes
  aSSLow  := a2 + a3 * (-1)
  aSSHigh := a2 + a3 * (1)

  # Conditional Indirect Effects
  abLow  := aSSLow * b
  abHigh := aSSHigh * b
'

fit <- sem(model,
           data      = d,
           estimator = "ML",
           se        = "bootstrap",
           bootstrap = 1000,
           mimic     = "Mplus")
```

PROCESS (Hayes 2017) Model 8 was used to estimate the predicted conditional process model where the GSR amplitude served as the mediator in our model. Here, the interaction of selfishness and EI significantly impacted physiological arousal ($b = -.07$, $t = -2.28$, $p = .02$). Both the main effect of EI ($b = -.03$, $t = -0.94$, $p = .35$) and selfishness ($b = .01$, $t = 0.29$, $p = .77$) were nonsignificant. Simple slopes analysis reveals that EI was negatively related to physiological arousal in the high selfishness condition ($b = -.10$, $t = -2.52$, $p = .01$) and unrelated in the low selfishness condition ($b = .04$, $t = 0.87$, $p = .39$). Thus, when participants were high in selfishness, increases in EI allowed them to mitigate their physiological arousal when considering whether to commit fraud.

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```
model <- '
  GSR       ~ a1*Cond + a2*CEISStd + a3*Cond:CEISStd
  PriceTag  ~ c1*Cond + c2*CEISStd + c3*Cond:CEISStd + b*GSR

  # Index of Moderated Mediation
  IndexOfModMed := a3 * b

  # Simple Slopes
  aSSLow  := a2 + a3 * (-1)
  aSSHigh := a2 + a3 * (1)

  # Conditional Indirect Effects
  abLow  := aSSLow  * b
  abHigh := aSSHigh * b
'
```

label	est	se	z	pvalue	ci.lower	ci.upper
a1	0.009	0.028	0.318	0.750	-0.046	0.067
a2	-0.030	0.031	-0.948	0.343	-0.092	0.029
a3	-0.072	0.031	-2.327	0.020	-0.135	-0.016
c1	0.035	0.148	0.237	0.813	-0.258	0.319
c2	0.003	0.148	0.020	0.984	-0.323	0.273
c3	0.302	0.144	2.100	0.036	0.008	0.579
b	-0.750	0.324	-2.315	0.021	-1.385	-0.080
IndexOfModMed	0.054	0.030	1.765	0.078	0.000	0.117
aSSLow	0.042	0.038	1.120	0.263	-0.030	0.119
aSSHigh	-0.101	0.049	-2.056	0.040	-0.207	-0.010
abLow	-0.032	0.034	-0.925	0.355	-0.116	0.021
abHigh	0.076	0.043	1.759	0.079	0.001	0.161

PROCESS (Hayes 2017) Model 8 was used to estimate the predicted conditional process model where the GSR amplitude served as the mediator in our model. Here, the interaction of selfishness and EI significantly impacted physiological arousal ($b = -.07$, $t = -2.28$, $p = .02$). Both the main effect of EI ($b = -.03$, $t = -0.94$, $p = .35$) and selfishness ($b = .01$, $t = 0.29$, $p = .77$) were nonsignificant. Simple slopes analysis reveals that EI was negatively related to physiological arousal in the high selfishness condition ($b = -.10$, $t = -2.52$, $p = .01$) and unrelated in the low selfishness condition ($b = .04$, $t = 0.87$, $p = .39$). Thus, when participants were high in selfishness, increases in EI allowed them to mitigate their physiological arousal when considering whether to commit fraud.

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```
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```

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```
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```
model <- '
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```
model <- '
  GSR       ~ a1*Cond + a2*CEISStd + a3*Cond:CEISStd
  PriceTag  ~ c1*Cond + c2*CEISStd + c3*Cond:CEISStd + b*GSR

  # Index of Moderated Mediation
  IndexOfModMed := a3*b

  # Simple Slopes
  aSSLow  := a2 + a3 * (-1)
  aSSHigh := a2 + a3 * (1)

  # Conditional Indirect Effects
  abLow  := aSSLow  * b
  abHigh := aSSHigh * b
'
```

label	est	se	z	pvalue	ci.lower	ci.upper
a1	0.009	0.028	0.318	0.750	-0.046	0.067
a2	-0.030	0.031	-0.948	0.343	-0.092	0.029
a3	-0.072	0.031	-2.327	0.020	-0.135	-0.016
c1	0.035	0.148	0.237	0.813	-0.258	0.319
c2	0.003	0.148	0.020	0.984	-0.323	0.273
c3	0.302	0.144	2.100	0.036	0.008	0.579
b	-0.750	0.324	-2.315	0.021	-1.385	-0.080
IndexOfModMed	0.054	0.030	1.765	0.078	0.000	0.117
aSSLow	0.042	0.038	1.120	0.263	-0.030	0.119
aSSHigh	-0.101	0.049	-2.056	0.040	-0.207	-0.010
abLow	-0.032	0.034	-0.925	0.355	-0.116	0.021
abHigh	0.076	0.043	1.759	0.079	0.001	0.161

我们接着看Study 4

- STUDY 1
- STUDY 2
- STUDY 3
- **STUDY 4**
- STUDY 5A
- STUDY 5B AND 5C

Study 4

```
library(tidyverse)

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

Selfish	Accident	Age	Gender	Embarrass	Guilt	Anxious	Shame	Threat	Risk	Reappraisal	SelfCheck	ZEI
-1	1	20	1	5.00	5.00	4.00	5	5.00	5.00	4.33	2.00	0.39213
-1	1	22	2	3.25	3.67	2.50	3	3.67	3.33	2.17	3.83	1.19666
-1	1	20	1	3.50	3.33	4.75	5	2.33	2.67	3.00	4.17	0.69459
-1	1	19	2	3.50	5.00	3.00	3	4.00	3.33	4.00	3.50	0.36793
-1	1	21	2	4.00	4.00	4.00	4	4.00	2.00	4.00	1.83	0.00499
-1	1	20	2	3.00	3.67	2.25	4	3.67	3.67	1.83	4.50	0.70063
-1	1	20	2	3.25	3.67	4.00	3	4.33	2.00	3.33	4.00	0.31954
-1	1	20	2	3.25	4.33	4.50	5	4.00	2.33	3.83	3.33	0.10782

Results

To begin, we analyzed our manipulation of selfishness. A *t*-test revealed that participants reported greater selfishness in the high selfishness condition ($M = 4.29$, SD $= 1.02$) relative to participants in the low selfishness condition ($M = 3.36$, SD $= 1.10$, $t(311) = 7.84$, $p < .001$).

A logistic regression was conducted with EI, selfishness, and their interaction predicting whether participants intended to commit insurance fraud (1 = yes, 0 = no). Multicollinearity was shown to not be an issue (VIFs < 1.03). The main effect of selfishness was significant (log odds $= .28$, $p = .035$), while the main effect of EI was not (log odds $= .06$, $p = .64$). These effects were qualified by a significant interaction of selfishness and EI (log odds $= .37$, $p = .005$). The effect size associated with the EI by selfishness interaction was $f^2 = .04$, which is characterized as a small effect (Dawson 2014). Results are displayed in figure 5. In the low selfishness condition there is a marginally significant relationship between EI and fraud (log odds $= -.31$, $z = -1.76$, $p = .08$). In the high selfishness condition, there is a significant positive relationship between EI and fraud (log odds $= .43$, $z = 2.19$, $p = .03$). These findings support hypothesis 1.

Then, we examined our full conceptual model through embarrassment using PROCESS Model 8 (Hayes 2017).

```
d %>%
  group_by(Selfish) %>%
  summarise(
    n  = n(),
    M  = mean(SelfCheck),
    SD = sd(SelfCheck)
  )
```

Selfish	n	M	SD
-1	157	3.36	1.09
1	156	4.29	1.02

```
d %>%
  mutate(Selfish = factor(Selfish,
    level = c(1, -1)
  )) %>%
  rstatix::t_test(SelfCheck ~ Selfish)
```

.y.	group1	group2	n1	n2	statistic	df	p
SelfCheck	1	-1	156	157	7.838	309.950	0.000

Results

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```
mod <- glm(Accident     ~ Selfish*ZEI,
           data = d,
           family = binomial(link = "logit")
)

mod %>%
  gtsummary::tbl_regression()
```

Characteristic	1">log(OR)[1]	1">95% CI[1]	p-value
Selfish	0.28	0.02, 0.54	0.037
Zscore(EIStd)	0.06	-0.19, 0.32	0.6
Selfish * Zscore(EIStd)	0.37	0.11, 0.63	0.005

[1] OR = Odds Ratio, CI = Confidence Interval

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FIGURE 5

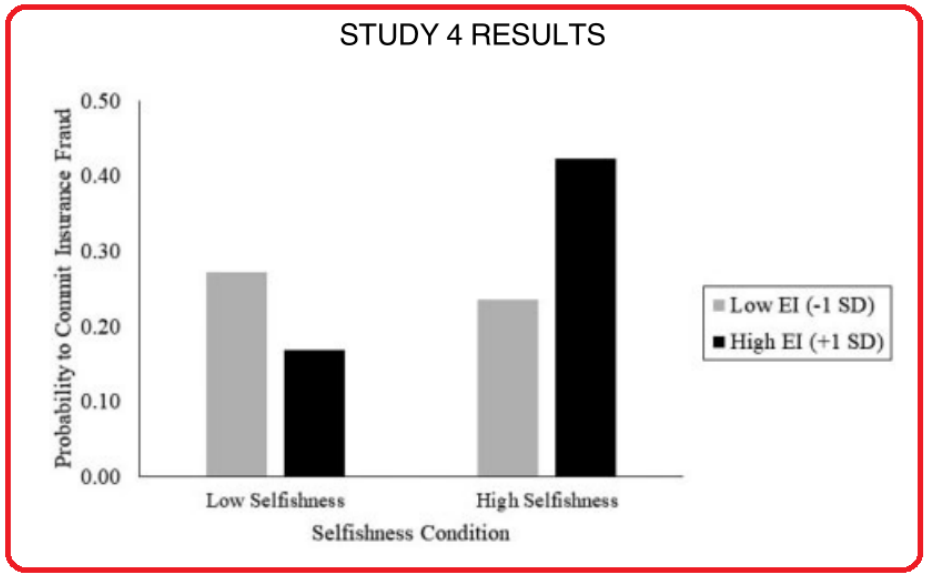
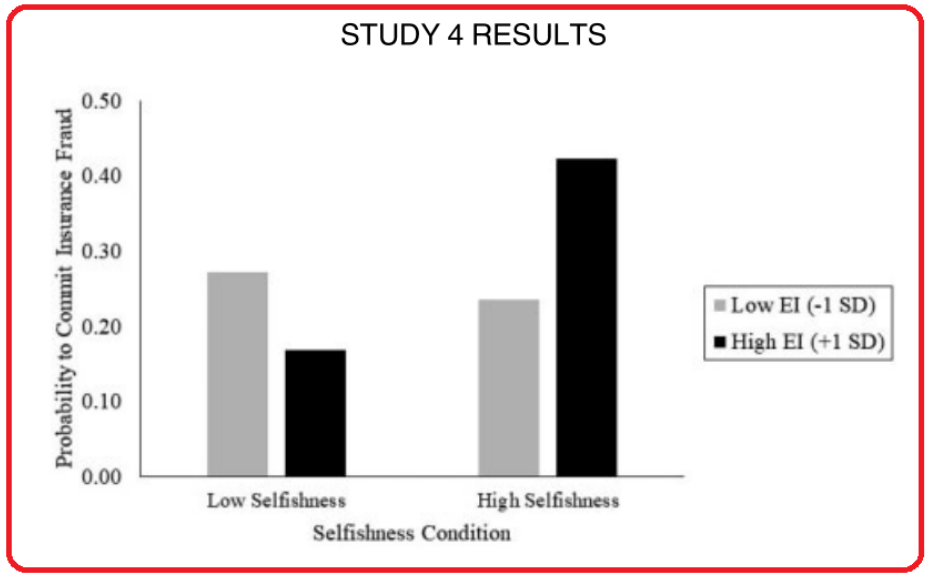


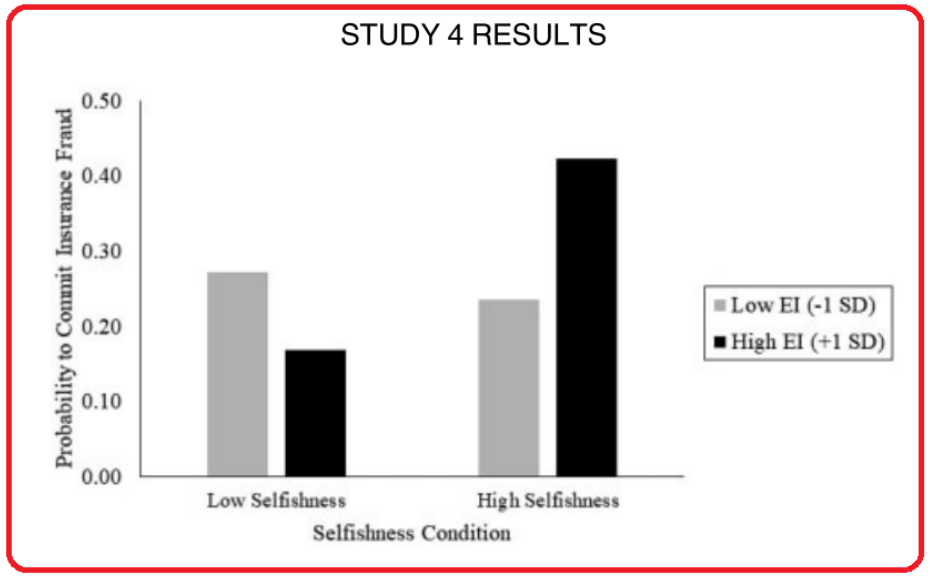
FIGURE 5



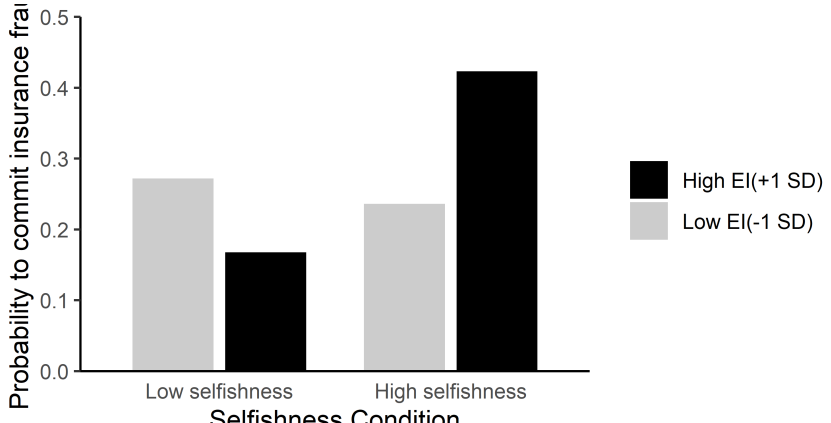

```
library(marginaleffects)
mod %>%
  marginaleffects::predictions(
    newdata = datagrid(
      Selfish = c(-1, 1),
      ZEI     = c(-1, 1)),
    type = "response"
  ) %>%
  as_tibble()
```

rowid	estimate	statistic	conf.low	conf.high	Selfish	ZEI
1	0.272	5.83	0.1804	0.363	-1	-1
2	0.168	4.13	0.0882	0.247	-1	1
3	0.236	4.53	0.1339	0.338	1	-1
4	0.423	7.31	0.3097	0.537	1	1

FIGURE 5




```r
library(marginaleffects)
mod %>%
  marginaleffects::predictions(
    newdata = datagrid(
      Selfish = c(-1, 1),
      ZEI     = c(-1, 1)),
    type = "response"
  ) %>%
  as_tibble() %>%
  mutate(
    across(c(Selfish, ZEI), as.factor)
  ) %>%
  ggplot(aes(x = Selfish, y = estimate)) +
  geom_col(aes(fill = ZEI),
    position = position_dodge(width = 0.8),
    width = 0.7
  )
```



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Then, we examined our full conceptual model through embarrassment using PROCESS Model 8 (Hayes 2017).

```
mod %>%
  marginaleffects::slopes(
    variables = "ZEI",
    by        = "Selfish",
    type      = "link"
  ) %>%
  as_tibble()
```

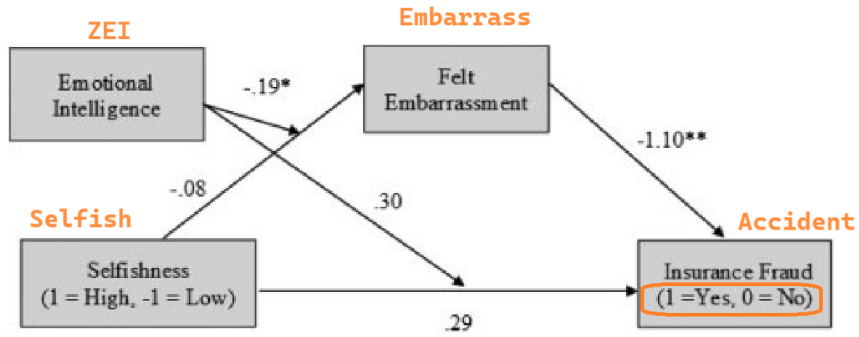
term	contrast	Selfish	estimate	std.error	statistic	p.value
ZEI	mean(dY/dX)	-1	-0.308	0.175	-1.76	0.0789
ZEI	mean(dY/dX)	1	0.432	0.197	2.19	0.0283

Then, we examined our full conceptual model through embarrassment using PROCESS Model 8 (Hayes 2017). First, we examine whether the selfishness × EI interaction predicted differences in embarrassment toward the decision to commit fraud. The main effects of selfishness ($a = -.08$, $t = -1.14$, $p = .25$) and EI ($a = -.03$, $t = -0.48$, $p = .63$) were nonsignificant. However, a significant interaction of EI and selfishness was observed ($a = -.19$, $t = -2.64$, $p = .008$). For participants in the high selfishness condition, increases in EI were negatively related to embarrassment ($a = -.22$, $t = -2.07$, $p = .04$). This finding suggests that participants in the high selfishness condition feel less embarrassment as EI increases, consistent with our theoretical framework. For participants in the low selfishness condition, increases in EI were marginally significant and positively related to embarrassment ($a = .15$, $t = 1.66$, $p = .10$).

In our model, the interaction of EI and selfishness predicted embarrassment, which subsequently predicted intentions to commit fraud. Results are displayed in figure 6. The index of moderated mediation was significant (Effect = .4095, 95% CI [.1322, .7577]). Furthermore, the main effect of selfishness ($\beta = .29$, $t = 1.87$, $p = .06$) and the selfishness × EI interaction ($\beta = .30$, $t = 1.91$, $p = .056$) became nonsignificant in predicting fraud intentions when embarrassment was included in our model. An indirect effect through embarrassment was observed for the high selfishness condition (Effect = .2422, 95% CI: [.0305, .4735]) and for the low selfishness condition (Effect = −.1673, 95% CI: [−.3616, −.0178]). Together, these results suggest that feelings of embarrassment mediate our observed effects, in support of hypothesis 2.

FIGURE 6

STUDY 4 MODERATED MEDIATION ANALYSIS RESULTS (PROCESS MODEL 8)



Note: All coefficients reported are unstandardized effects. *$p < .01$, **$p < .001$.

```r
Mediation_function_binary_outcome <- function(data_used, i) {
  # Sample a data
  data_temp <- data_used[i, ]

  # a path
  result_a <- lm(Embarrass ~ Selfish + ZEI + Selfish:ZEI,
                 data = data_temp)

  a0 <- result_a$coefficients[1]
  a1 <- result_a$coefficients[2]
  a2 <- result_a$coefficients[3]
  a3 <- result_a$coefficients[4]

  # b path
  result_b <- glm(
    Accident ~ Embarrass + Selfish + ZEI + Selfish:ZEI,
    data = data_temp,
    family = binomial(link = "logit"))

  c0 <- result_b$coefficients[1]
  b  <- result_b$coefficients[2]
  c1 <- result_b$coefficients[3]
  c2 <- result_b$coefficients[4]
  c3 <- result_b$coefficients[5]


  # Index of Moderated Mediation
  IndexOfModMed <- a3 * b

  # Simple Slopes of Embarrass on ZEI
  aSSLow  <- a2 + a3 * (-1)
  aSSHigh <- a2 + a3 * (1)

  # Conditional Indirect Effects
  abLow  <- aSSLow  * b
  abHigh <- aSSHigh * b

  return(
    c(a1, a2, a3, c1, c2, c3, b,
      IndexOfModMed,
      aSSLow, aSSHigh, abLow, abHigh)
   )
}
```

```r
library(boot)

boot_mediation <- boot(d,
  Mediation_function_binary_outcome,
  R = 5000
)

xcoef <- c(
  "a1", "a2", "a3", "c1", "c2", "c3", "b",
  "IndexOfModMed", "aSSLow", "aSSHigh", "abLow", "abHigh"
)

fun <- function(i) {
  aa <- boot::boot.ci(boot_mediation,
    index = i,
    conf = 0.95, type = "perc"
  )

  tibble(
    mean      = aa$t0,
    ci.lower  = aa$percent[4],
    ci.higher = aa$percent[5]
  )
}

res <- tibble(
  idx = 1:12,
  label = xcoef
) %>%
  rowwise() %>%
  mutate(fun(idx))
```

Then, we examined our full conceptual model through embarrassment using PROCESS Model 8 (Hayes 2017). First, we examine whether the selfishness × EI interaction predicted differences in embarrassment toward the decision to commit fraud. The main effects of selfishness ($a = -.08$, $t = -1.14$, $p = .25$) and EI ($a = -.03$, $t = -0.48$, $p = .63$) were nonsignificant. However, a significant interaction of EI and selfishness was observed ($a = -.19$, $t = -2.64$, $p = .008$). For participants in the high selfishness condition, increases in EI were negatively related to embarrassment ($a = -.22$, $t = -2.07$, $p = .04$). This finding suggests that participants in the high selfishness condition feel less embarrassment as EI increases, consistent with our theoretical framework. For participants in the low selfishness condition, increases in EI were marginally significant and positively related to embarrassment ($a = .15$, $t = 1.66$, $p = .10$).

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idx	label	mean	ci.lower	ci.higher
1	a1	-0.078	-0.217	0.055
2	a2	-0.034	-0.156	0.098
3	a3	-0.186	-0.312	-0.058
4	c1	0.290	-0.020	0.630
5	c2	0.025	-0.274	0.358
6	c3	0.300	0.000	0.632
7	b	-1.097	-1.443	-0.859
8	IndexOfModMed	0.204	0.063	0.371
9	aSSLow	0.152	-0.012	0.333
10	aSSHigh	-0.220	-0.402	-0.034
11	abLow	-0.167	-0.392	0.013
12	abHigh	0.241	0.038	0.473

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11	abLow	-0.167	-0.392	0.013
12	abHigh	0.241	0.038	0.473

Then, we examined our full conceptual model through embarrassment using PROCESS Model 8 (Hayes 2017). First, we examine whether the selfishness × EI interaction predicted differences in embarrassment toward the decision to commit fraud. The main effects of selfishness ($a = -.08$, $t = -1.14$, $p = .25$) and EI ($a = -.03$, $t = -0.48$, $p = .63$) were nonsignificant. However, a significant interaction of EI and selfishness was observed ($a = -.19$, $t = -2.64$, $p = .008$). For participants in the high selfishness condition, increases in EI were negatively related to embarrassment ($a = -.22$, $t = -2.07$, $p = .04$). This finding suggests that participants in the high selfishness condition feel less embarrassment as EI increases, consistent with our theoretical framework. For participants in the low selfishness condition, increases in EI were marginally significant and positively related to embarrassment ($a = .15$, $t = 1.66$, $p = .10$).

In our model, the interaction of EI and selfishness predicted embarrassment, which subsequently predicted intentions to commit fraud. Results are displayed in figure 6. The index of moderated mediation was significant (Effect = .4095, 95% CI [.1322, .7577]). Furthermore, the main effect of selfishness ($\beta = .29$, $t = 1.87$, $p = .06$) and the selfishness × EI interaction ($\beta = .30$, $t = 1.91$, $p = .056$) became nonsignificant in predicting fraud intentions when embarrassment was included in our model. An indirect effect through embarrassment was observed for the high selfishness condition (Effect = .2422, 95% CI: [.0305, .4735]) and for the low selfishness condition (Effect = −.1673, 95% CI: [−.3616, −.0178]). Together, these results suggest that feelings of embarrassment mediate our observed effects, in support of hypothesis 2.

idx	label	mean	ci.lower	ci.higher
1	a1	-0.078	-0.217	0.055
2	a2	-0.034	-0.156	0.098
3	a3	-0.186	-0.312	-0.058
4	c1	0.290	-0.020	0.630
5	c2	0.025	-0.274	0.358
6	c3	0.300	0.000	0.632
7	b	-1.097	-1.443	-0.859
8	IndexOfModMed	0.204	0.063	0.371
9	aSSLow	0.152	-0.012	0.333
10	aSSHigh	-0.220	-0.402	-0.034
11	abLow	-0.167	-0.392	0.013
12	abHigh	0.241	0.038	0.473

我们接着看Study 5A

- STUDY 1
- STUDY 2
- STUDY 3
- STUDY 4
- **STUDY 5A**
- STUDY 5B AND 5C

Study 5A

```
library(tidyverse)

d <- haven::read_sav("./data/Study 5a.sav")
```

Embarrass	Return	Age	Gender	EmbManip	ZEI	ZSelfish
1	1	20	1	3.75	-0.307	-2.12
0	1	21	2	1.75	-0.151	-2.12
0	1	21	1	1.00	0.161	-1.94
0	1	21	2	2.00	-2.346	-1.57

- **Embarrass** : 0/1
- **Return** : 1/2
- **Age** :
- **Gender** :
- **EmbManip** :
- **ZEI** :
- **ZSelfish** :

available in the appendix.

After the fraud scenario, participants completed the study 2 selfishness ($\alpha = .78$) and EI (split-half reliability = .66) measures. Scores on both measures were standardized ($M = 0$, SD = 1) for ease of interpretability. To conclude, participants provided their age and gender.

Results

To begin, we analyzed our manipulation of embarrassment. A *t*-test revealed that participants reported greater felt embarrassment in the embarrassment condition ($M = 4.13$, SD = .97) relative to those in the control condition ($M = 2.02$, SD = 1.00, $t(696) = 28.17$, $p < .001$).

To analyze the interaction of selfishness, EI, and embarrassment (0 = control, 1 = embarrassment) in predicting fraud intentions, we used PROCESS model 3 (Hayes 2017) as this model is specifically designed to interpret three-way interactions in regression analysis. EI and selfishness were negatively correlated ($r = -.21$, $p < .001$), but multicollinearity was shown to not be an issue (VIFs < 2.78). All effects are provided in table 1. Importantly, all observed effects were qualified by the significant three-way

```
d %>%
  group_by(Embarrass) %>%
  summarise(
    n  = n(),
    M  = mean(EmbManip, na.rm = TRUE),
    SD = sd(EmbManip, na.rm = TRUE)
  )
```

Embarrass	n	M	SD
0	347	2.02	0.998
1	351	4.13	0.973

```
d %>%
  drop_na() %>%
  mutate(Embarrass = factor(
    Embarrass,
    level = c(1, 0))
  ) %>%
  rstatix::t_test(EmbManip ~ Embarrass)
```

.y.	group1	group2	n1	n2	statistic	df	p
EmbManip	1	0	350	347	28.166	694.193	0.000

available in the appendix.

After the fraud scenario, participants completed the study 2 selfishness ($\alpha = .78$) and EI (split-half reliability = .66) measures. Scores on both measures were standardized ($M = 0$, SD = 1) for ease of interpretability. To conclude, participants provided their age and gender.

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```
d %>%
  rstatix::cor_test(vars = c(ZEI, ZSelfish))
```

var1	var2	cor	statistic	p	conf.low	conf.high	method
ZEI	ZSelfish	-0.22	-5.92	0.00000000505	-0.288	-0.147	Pearson

available in the appendix.

After the fraud scenario, participants completed the study 2 selfishness ($\alpha = .78$) and EI (split-half reliability = .66) measures. Scores on both measures were standardized ($M = 0$, SD = 1) for ease of interpretability. To conclude, participants provided their age and gender.

Results

To begin, we analyzed our manipulation of embarrassment. A *t*-test revealed that participants reported greater felt embarrassment in the embarrassment condition ($M = 4.13$, SD = .97) relative to those in the control condition ($M = 2.02$, SD = 1.00, $t(696) = 28.17$, $p < .001$).

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TABLE 1

STUDY 5A RESULTS

Source	Log odds	Std. error	*Z*	Sig.
Selfishness (A)	.5839	.1259	4.11	<.001
Emotional intelligence (B)	−.1557	.1299	−1.20	.23
Embarrassment (C)	−.2094	.1799	−1.16	.24
A*B	.3172	.1437	2.21	.027
A*C	−.3402	.1914	−1.78	.075
B*C	.0257	.1834	0.14	.89
A*B*C	−.4235	.1798	−2.36	.019

TABLE 1

STUDY 5A RESULTS

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B*C	.0257	.1834	0.14	.89
A*B*C	−.4235	.1798	−2.36	.019

```
d1 <- d %>% mutate(Return = Return - 1)

mod1 <- glm(Return ~ ZSelfish * ZEI * Embarrass,
            data = d1,
            family = binomial(link = "logit")
)
mod1 %>%
  flextable::as_flextable()
```

	Estimate	Standard Error	z value	Pr(>|z|)	
(Intercept)	-0.932	0.126	-7.401	0.0000	***
ZSelfish	0.584	0.142	4.114	0.0000	***
ZEI	-0.156	0.130	-1.199	0.2305	
Embarrass	-0.209	0.180	-1.164	0.2443	
ZSelfish:ZEI	0.317	0.144	2.207	0.0273	*
ZSelfish:Embarrass	-0.340	0.191	-1.777	0.0755	.
ZEI:Embarrass	0.026	0.183	0.140	0.8887	
ZSelfish:ZEI:Embarrass	-0.424	0.180	-2.355	0.0185	*

*Signif. codes: 0 <= '***' < 0.001 < '**' < 0.01 < '*' < 0.05*

(Dispersion parameter for binomial family taken to be 1)

Null deviance: 813.3 on 697 degrees of freedom

Residual deviance: 779.2 on 690 degrees of freedom

interaction of selfishness, EI, and embarrassment (log odds $= -.4235, Z = -2.36, p = .02$).

The significant three-way interaction was interpreted within the PROCESS macro in two ways and is displayed in figure 7. Tests of the conditional interaction effects revealed that in the control condition, a significant interaction of selfishness and EI was observed (log odds $= .3172$, $\chi^2 = 4.87$, $p = .027$). In the control condition, floodlight analyses revealed Johnson–Neyman points (Johnson and Neyman 1936) of 3.37 and $-.57$. For participants with a selfishness score of 3.37 SD above the mean and higher (.9% of participants), those with high EI were significantly more likely to commit fraud relative to those with low EI. Participants with a selfishness score of $-.57$ SD below the mean and less (27.1% of participants) were also more likely to commit fraud in the low (vs. high) EI condition. These results support hypothesis 1. However, in the embarrassment condition, the interaction of selfishness and EI was nonsignificant (log odds $= -.1063$, $\chi^2 = .97$, $p = .33$). These results support our conceptual model of EI, selfishness, and embarrassment in predicting fraud.

Finally, we performed a *post-hoc* power analysis using G*Power (Faul et al. 2007) to ensure adequate statistical power in our study. Based on our observed interaction effect and sample size, the statistical power of .99 was observed.

	Estimate	Standard Error	z value	Pr(>|z|)	
(Intercept)	-0.932	0.126	-7.401	0.0000	***
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ZEI	-0.156	0.130	-1.199	0.2305	
Embarrass	-0.209	0.180	-1.164	0.2443	
ZSelfish:ZEI	0.317	0.144	2.207	0.0273	*
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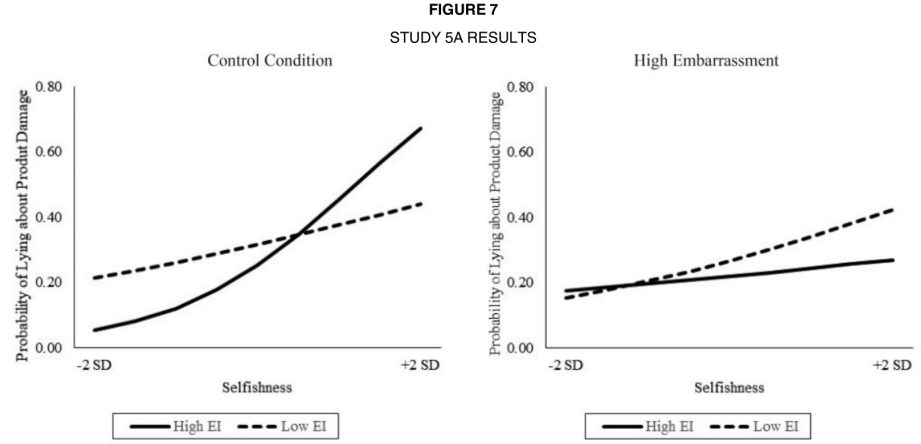
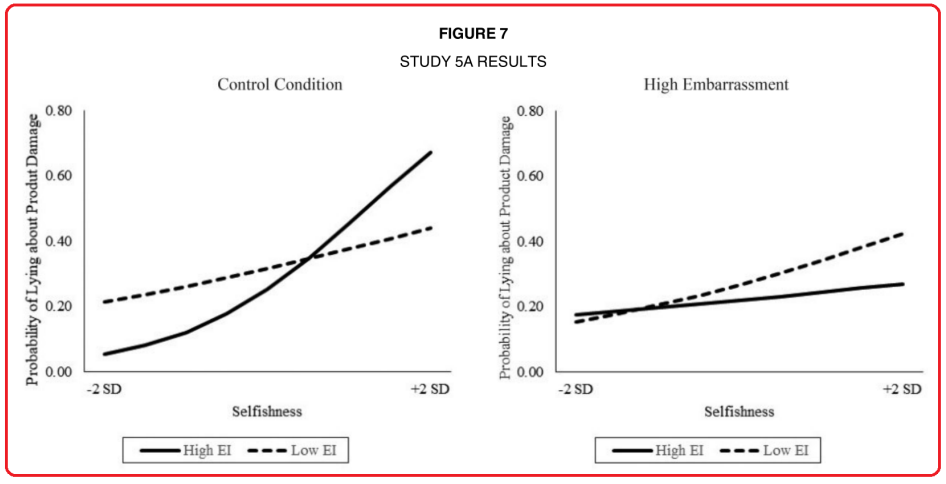
Finally, we performed a *post-hoc* power analysis using G*Power (Faul et al. 2007) to ensure adequate statistical power in our study. Based on our observed interaction effect and sample size, the statistical power of .99 was observed.

FIGURE 7

STUDY 5A RESULTS

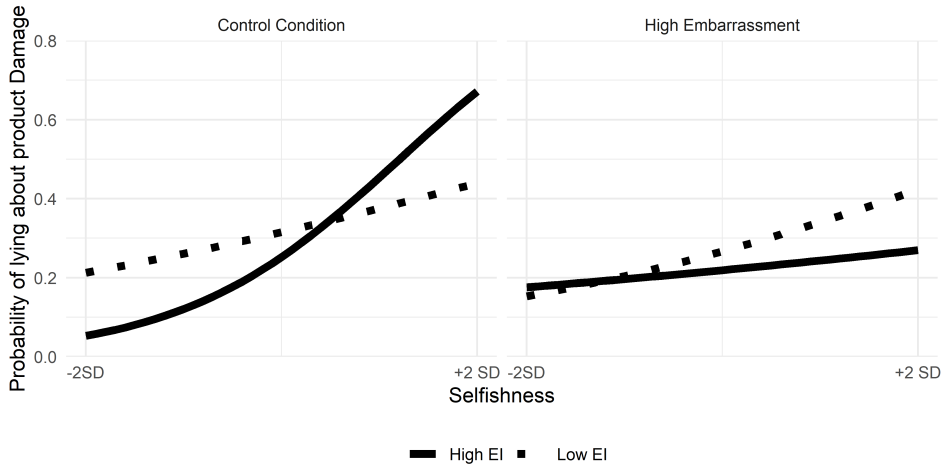





```
library(marginaleffects)

mod1 %>%
  marginaleffects::predictions(
    newdata = datagrid(
      ZSelfish  = seq(-2, 2, by = 0.1),
      ZEI       = c(-1, 1),
      Embarrass = c(0, 1)
    ),
    type = "response"
  ) %>%
  as_tibble() %>%

  mutate(across(c(ZEI, Embarrass), as.factor)) %>%
  ggplot(aes(x = ZSelfish, y = estimate, group = ZEI)) +
  geom_line(aes(linetype = ZEI), linewidth = 2)
```



interaction of selfishness, EI, and embarrassment (log odds $= -.4235, Z = -2.36, p = .02$).

The significant three-way interaction was interpreted within the PROCESS macro in two ways and is displayed in figure 7. Tests of the conditional interaction effects revealed that in the control condition, a significant interaction of selfishness and EI was observed (log odds $= .3172$, $\chi^2 = 4.87$, $p = .027$). In the control condition, floodlight analyses revealed Johnson–Neyman points (Johnson and Neyman 1936) of 3.37 and −.57. For participants with a selfishness score of 3.37 SD above the mean and higher (.9% of participants), those with high EI were significantly more likely to commit fraud relative to those with low EI. Participants with a selfishness score of −.57 SD below the mean and less (27.1% of participants) were also more likely to commit fraud in the low (vs. high) EI condition. These results support hypothesis 1. However, in the embarrassment condition, the interaction of selfishness and EI was nonsignificant (log odds $= -.1063$, $\chi^2 = .97$, $p = .33$). These results support our conceptual model of EI, selfishness, and embarrassment in predicting fraud.

Finally, we performed a *post-hoc* power analysis using G*Power (Faul et al. 2007) to ensure adequate statistical power in our study. Based on our observed interaction effect and sample size, the statistical power of .99 was observed.

```
d2 <- d %>%
  mutate(
    ZSelfish_x_ZEI          = ZSelfish * ZEI,
    ZSelfish_x_Embarrass    = ZSelfish * Embarrass,
    ZEI_x_Embarrass         = ZEI * Embarrass
  ) %>%
  mutate(Return = Return - 1)

mod2 <- glm(Return ~ ZSelfish + ZEI + Embarrass + ZSelfish_x_ZEI +
              ZSelfish_x_Embarrass + ZEI_x_Embarrass +
              ZSelfish_x_ZEI:Embarrass,
            data = d2,
            family = binomial(link = "logit")
)

mod2 %>%
  marginaleffects::avg_slopes(
    variables = "ZSelfish_x_ZEI",
    by        = "Embarrass",
    type      = "link"
  ) %>%
  as_tibble()
```

term	contrast	Embarrass	estimate	std.error	statistic	p.value
ZSelfish_x_ZEI	mean(dY/dX)	0	0.317	0.144	2.207	0.0273
ZSelfish_x_ZEI	mean(dY/dX)	1	-0.106	0.108	-0.984	0.3252

interaction of selfishness, EI, and embarrassment (log odds $= -.4235, Z = -2.36, p = .02$).

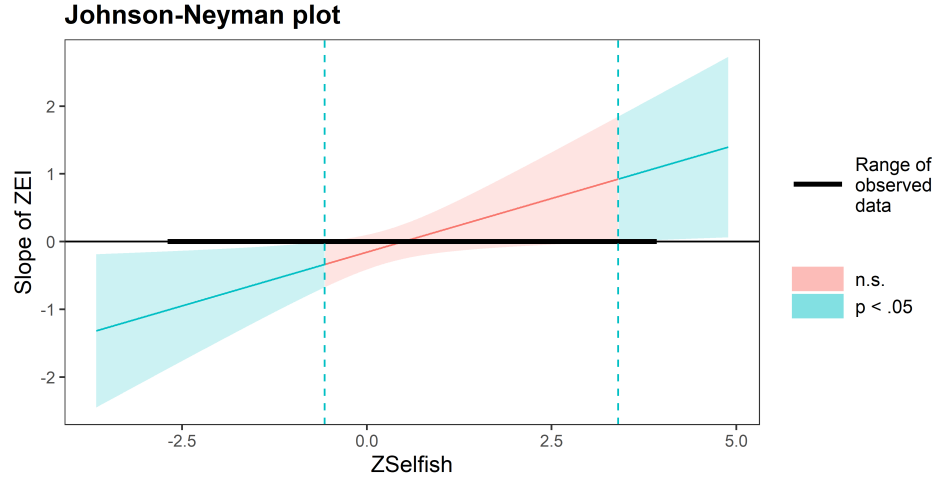
The significant three-way interaction was interpreted within the PROCESS macro in two ways and is displayed in figure 7. Tests of the conditional interaction effects revealed that in the control condition, a significant interaction of selfishness and EI was observed (log odds $= .3172$, $\chi^2 = 4.87$, $p = .027$). In the control condition, floodlight analyses revealed Johnson–Neyman points (Johnson and Neyman 1936) of 3.37 and −.57. For participants with a selfishness score of 3.37 SD above the mean and higher (.9% of participants), those with high EI were significantly more likely to commit fraud relative to those with low EI. Participants with a selfishness score of −.57 SD below the mean and less (27.1% of participants) were also more likely to commit fraud in the low (vs. high) EI condition. These results support hypothesis 1. However, in the embarrassment condition, the interaction of selfishness and EI was nonsignificant (log odds $= -.1063$, $\chi^2 = .97$, $p = .33$). These results support our conceptual model of EI, selfishness, and embarrassment in predicting fraud.

Finally, we performed a *post-hoc* power analysis using G*Power (Faul et al. 2007) to ensure adequate statistical power in our study. Based on our observed interaction effect and sample size, the statistical power of .99 was observed.

```
library(interactions)

mod1 %>%
  interactions::johnson_neyman(
    pred = "ZEI",
    modx = "ZSelfish",
    alpha = 0.05
  )
```

```
## JOHNSON-NEYMAN INTERVAL
##
## When ZSelfish is OUTSIDE the interval [-0.57, 3.40], the slop
## < .05.
##
## Note: The range of observed values of ZSelfish is [-2.66, 3.8
```



我们接着看Study 5B

- STUDY 1
- STUDY 2
- STUDY 3
- STUDY 4
- STUDY 5A
- STUDY 5B AND 5C

Study 5B

```
library(tidyverse)

d <- haven::read_sav("./data/Study5b.sav")
```

Cond	Return	ZCEIS	ZSF	GuiltMC_All
0	1	0.672	-2.19	1.0
0	1	0.178	-2.19	1.0
0	1	-0.161	-2.19	1.0
1	1	-0.873	-2.19	4.5
1	1	1.548	-2.05	4.0
0	1	1.078	-2.05	1.0

- **Cond** : 0 = control / 1 = Guilt
- **Return** : 1 = Kepp / 2 = Return
- **ZCEIS** : EI
- **ZSF** : selfishness
- **GuiltMC_All** : guilt manipulation check

Results

Preliminary Findings. To begin, the manipulation checks were assessed across studies. In study 5b, the guilt manipulation check was successful as those in the high guilt condition reported greater felt guilt ($M = 3.77$, SD = .93) than those in the low guilt condition ($M = 1.47$, SD = .84, $t(526) = 29.75$, $p < .001$). Similarly, in study 5c, the shame manipulation was also effective as those in the high shame condition reported greater felt shame ($M = 3.78$, SD = .91) than in the low shame condition ($M = 1.78$, SD = 1.17, $t(540) = 22.01$, $p < .001$).

Study 5b Main Results. PROCESS model 3 (Hayes 2017) was used to examine the potential effect of selfishness, EI, and emotion (0 = control, 1 = guilt), and their interactions in predicting fraud intentions. The selfishness and EI measures were negatively correlated in study 5b ($r = -.35$, $p < .001$), but multicollinearity was shown to not be an issue ($VIFs_{5B} < 3.62$). The results are provided in table 2. Unlike study 5a, the three-way interaction between selfishness, EI, and emotion was nonsignificant (log odds = −.2680, $Z = -1.17$, $p = .24$). However, and as predicted, the two-way interaction between EI and selfishness was significant (log odds = .4327, $Z = 2.36$, $p = .02$). Floodlight analyses were used to further examine this interaction and revealed Johnson–Neyman points (Johnson and Neyman 1936) of −.49 and 2.22. For participants with a selfishness score of 2.22 SD above the mean and higher (1.1% of participants), participants with high levels of EI

```
d %>%
  summarise(
    n  = n(),
    M  = mean(GuiltMC_All, na.rm = TRUE),
    SD = sd(GuiltMC_All, na.rm = TRUE),
    .by = Cond
  )
```

Cond	n	M	SD
0	276	1.47	0.841
1	252	3.77	0.933

```
d %>%
  mutate(Cond = factor(Cond, level = c(1, 0))
  ) %>%
  rstatix::t_test(GuiltMC_All ~ Cond)
```

.y.	group1	group2	n1	n2	statistic	df	p
GuiltMC_All	1	0	252	276	29.611	506.877	0.000

```
d %>%
  rstatix::cor_test(vars = c(ZCEIS, ZSF))
```

var1	var2	cor	statistic	p	conf.low	conf.high	method
ZCEIS	ZSF	-0.350	-8.596	0.000	-0.424	-0.274	Pearson

Results

Preliminary Findings. To begin, the manipulation checks were assessed across studies. In study 5b, the guilt manipulation check was successful as those in the high guilt condition reported greater felt guilt ($M = 3.77$, SD = .93) than those in the low guilt condition ($M = 1.47$, SD = .84, $t(526) = 29.75$, $p < .001$). Similarly, in study 5c, the shame manipulation was also effective as those in the high shame condition reported greater felt shame ($M = 3.78$, SD = .91) than in the low shame condition ($M = 1.78$, SD = 1.17, $t(540) = 22.01$, $p < .001$).

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TABLE 2

STUDY 5B RESULTS

Source	Log odds	Std. error	*Z*	Sig.
Selfishness (A)	.1540	.1666	0.92	.36
Emotional intelligence (B)	−.3918	.1749	−2.24	.03
Guilt (C)	.1256	.2241	0.56	.58
A*B	.4327	.1832	2.36	.02
A*C	.0880	.2307	0.38	.70
B*C	.4668	.2456	1.90	.06
A*B*C	−.2680	.2287	−1.17	.24

TABLE 3

STUDY 5C RESULTS

Source	Log odds	Std. error	*Z*	Sig.
Selfishness (A)	.6030	.2213	2.73	<.01
Emotional intelligence (B)	−.3284	.2544	−1.29	.20
Shame (C)	.6958	.2645	2.63	<.01
A*B	.6913	.2467	2.80	<.01
A*C	.0590	.2974	0.20	.84
B*C	.4549	.3287	1.38	.17
A*B*C	−.3231	.3108	1.04	.30

TABLE 2

STUDY 5B RESULTS

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Selfishness (A)	.1540	.1666	0.92	.36
Emotional intelligence (B)	−.3918	.1749	−2.24	.03
Guilt (C)	.1256	.2241	0.56	.58
A*B	.4327	.1832	2.36	.02
A*C	.0880	.2307	0.38	.70
B*C	.4668	.2456	1.90	.06
A*B*C	−.2680	.2287	−1.17	.24

TABLE 3

STUDY 5C RESULTS

Source	Log odds	Std. error	*Z*	Sig.
Selfishness (A)	.6030	.2213	2.73	<.01
Emotional intelligence (B)	−.3284	.2544	−1.29	.20
Shame (C)	.6958	.2645	2.63	<.01
A*B	.6913	.2467	2.80	<.01
A*C	.0590	.2974	0.20	.84
B*C	.4549	.3287	1.38	.17
A*B*C	−.3231	.3108	1.04	.30

```
d1 <- d %>% mutate(Return = Return - 1)

mod1 <- glm(Return ~ ZSF * ZCEIS * Cond,
            data = d1,
            family = binomial(link = "logit")
)


mod1 %>%
  flextable::as_flextable()
```

	Estimate	Standard Error	z value	Pr(>|z|)	
(Intercept)	-1.331	0.155	-8.582	0.0000	***
ZSF	0.154	0.167	0.924	0.3554	
ZCEIS	-0.392	0.175	-2.240	0.0251	*
Cond	0.126	0.224	0.560	0.5752	
ZSF:ZCEIS	0.433	0.183	2.362	0.0182	*
ZSF:Cond	0.088	0.231	0.381	0.7030	
ZCEIS:Cond	0.467	0.246	1.901	0.0573	.
ZSF:ZCEIS:Cond	-0.268	0.229	-1.172	0.2413	

*Signif. codes: 0 <= '***' < 0.001 < '**' < 0.01 < '*' < 0.05*

(Dispersion parameter for binomial family taken to be 1)

Null deviance: 540.4 on 527 degrees of freedom

Residual deviance: 526.4 on 520 degrees of freedom

Results

Preliminary Findings. To begin, the manipulation checks were assessed across studies. In study 5b, the guilt manipulation check was successful as those in the high guilt condition reported greater felt guilt ($M = 3.77$, SD = .93) than those in the low guilt condition ($M = 1.47$, SD = .84, $t(526) = 29.75$, $p < .001$). Similarly, in study 5c, the shame manipulation was also effective as those in the high shame condition reported greater felt shame ($M = 3.78$, SD = .91) than in the low shame condition ($M = 1.78$, SD = 1.17, $t(540) = 22.01$, $p < .001$).

Study 5b Main Results. PROCESS model 3 (Hayes 2017) was used to examine the potential effect of selfishness, EI, and emotion (0 = control, 1 = guilt), and their interactions in predicting fraud intentions. The selfishness and EI measures were negatively correlated in study 5b ($r = -.35$, $p < .001$), but multicollinearity was shown to not be an issue ($VIFs_{5B} < 3.62$). The results are provided in table 2. Unlike study 5a, the three-way interaction between selfishness, EI, and emotion was nonsignificant (log odds = −.2680, $Z = -1.17$, $p = .24$). However, and as predicted, the two-way interaction between EI and selfishness was significant (log odds = .4327, $Z = 2.36$, $p = .02$). Floodlight analyses were used to further examine this interaction and revealed Johnson–Neyman points (Johnson and Neyman 1936) of −.49 and 2.22. For participants with a selfishness score of 2.22 SD above the mean and higher (1.1% of participants), participants with high levels of EI

	Estimate	Standard Error	z value	Pr(>|z|)	
(Intercept)	-1.331	0.155	-8.582	0.0000	***
ZSF	0.154	0.167	0.924	0.3554	
ZCEIS	-0.392	0.175	-2.240	0.0251	*
Cond	0.126	0.224	0.560	0.5752	
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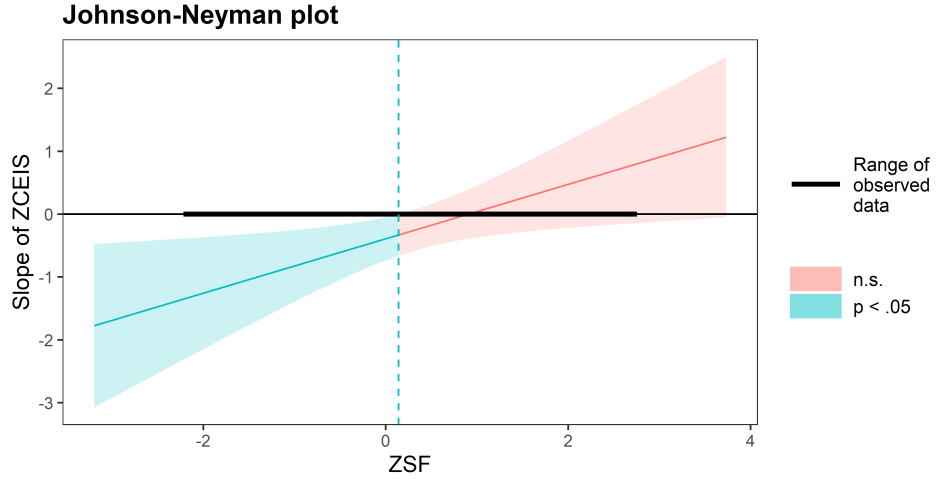
```
library(interactions)

mod1 %>%
  interactions::johnson_neyman(
    pred = "ZCEIS",
    modx = "ZSF",
    alpha = 0.05
  )
```

```
## JOHNSON-NEYMAN INTERVAL
##
## When ZSF is OUTSIDE the interval [0.14, 4.40], the slope of Z
## .05.
##
## Note: The range of observed values of ZSF is [-2.19, 2.73]
```



我们接着看Study 5C

- STUDY 1
- STUDY 2
- STUDY 3
- STUDY 4
- STUDY 5A
- STUDY 5B AND 5C

Study 5C

```
library(tidyverse)

d <- haven::read_sav("./data/Study 5c.sav")
```

Return	ShameMC	Cond	ZCEIS	ZSF
2	4.75	1	0.6769	2.13
1	1.00	0	0.4519	2.13
1	5.00	1	-0.0242	2.13
1	4.25	1	-1.6741	2.13
2	1.00	0	1.4268	2.02
2	1.25	0	-0.1705	2.02

- **Return** : 1 = Kepp / 2 = Return
- **ShameMC** :
- **Cond** : 0 = control / 1 = Guilt
- **ZCEIS** : EI
- **ZSF** : selfishness

Results

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```
d %>%
  summarise(
    n  = n(),
    M  = mean(ShameMC, na.rm = TRUE),
    SD = sd(ShameMC, na.rm = TRUE),
    .by = Cond
  )
```

Cond	n	M	SD
1	254	3.78	0.914
0	288	1.78	1.169

```
d %>%
  mutate(Cond = factor(Cond,
                       level = c(1, 0))
  ) %>%
  rstatix::t_test(ShameMC ~ Cond)
```

.y.	group1	group2	n1	n2	statistic	df	p
ShameMC	1	0	254	288	22.342	532.510	0.000

Study 5c Main Results. PROCESS Model 3 was also used to examine the effect of selfishness, EI, and emotion (0 = control, 1 = shame) and their interactions on fraud intentions. The selfishness and EI measures were negatively correlated in study 5c ($r = -.58$, $p < .001$), but multicollinearity was shown to not be an issue ($VIFs_{5C} < 3.59$). Complete results are provided in table 3. As in study 5b, the three-way interaction between selfishness, EI, and emotion was nonsignificant (log odds = $-.3231$, $Z = -1.04$, $p = .30$). Replicating the results of prior studies, the two-way interaction between EI and selfishness was significant (log odds = .6913, $Z = 2.80$, $p < .01$). Floodlight analyses were used to further examine this interaction and revealed Johnson–Neyman points (Johnson and Neyman 1936) of $-.96$ and .76. For participants with a selfishness score of .76 SD above the mean and higher (22.0% of participants), participants with high levels of EI (+1 SD) were more likely to commit fraud than those with low levels of EI (−1 SD). For those with a selfishness score of .96 SD below the mean and lower (21.2% of participants), those with low levels of EI were more likely to

```
d %>%
  rstatix::cor_test(vars = c(ZCEIS, ZSF))
```

var1	var2	cor	statistic	p	conf.low	conf.high	method
ZCEIS	ZSF	-0.580	-16.723	0.000	-0.637	-0.526	Pearson

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TABLE 2

STUDY 5B RESULTS

Source	Log odds	Std. error	*Z*	Sig.
Selfishness (A)	.1540	.1666	0.92	.36
Emotional intelligence (B)	−.3918	.1749	−2.24	.03
Guilt (C)	.1256	.2241	0.56	.58
A*B	.4327	.1832	2.36	.02
A*C	.0880	.2307	0.38	.70
B*C	.4668	.2456	1.90	.06
A*B*C	−.2680	.2287	−1.17	.24

TABLE 3

STUDY 5C RESULTS

Source	Log odds	Std. error	*Z*	Sig.
Selfishness (A)	.6030	.2213	2.73	<.01
Emotional intelligence (B)	−.3284	.2544	−1.29	.20
Shame (C)	.6958	.2645	2.63	<.01
A*B	.6913	.2467	2.80	<.01
A*C	.0590	.2974	0.20	.84
B*C	.4549	.3287	1.38	.17
A*B*C	−.3231	.3108	1.04	.30

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```
d1 <- d %>% mutate(Return = Return - 1)

mod1 <- glm(Return     ~ ZSF * ZCEIS * Cond,
            data = d1,
            family = binomial(link = "logit")
)


mod1 %>%
  flextable::as_flextable()
```

	Estimate	Standard Error	z value	Pr(>|z|)	
(Intercept)	-1.636	0.195	-8.375	0.0000	***
ZSF	0.603	0.221	2.725	0.0064	**
ZCEIS	-0.328	0.254	-1.291	0.1967	
Cond	0.696	0.264	2.631	0.0085	**
ZSF:ZCEIS	0.691	0.247	2.802	0.0051	**
ZSF:Cond	0.059	0.297	0.198	0.8427	
ZCEIS:Cond	0.455	0.329	1.384	0.1664	
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##
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##
## Note: The range of observed values of ZSF is [-2.05, 2.13]
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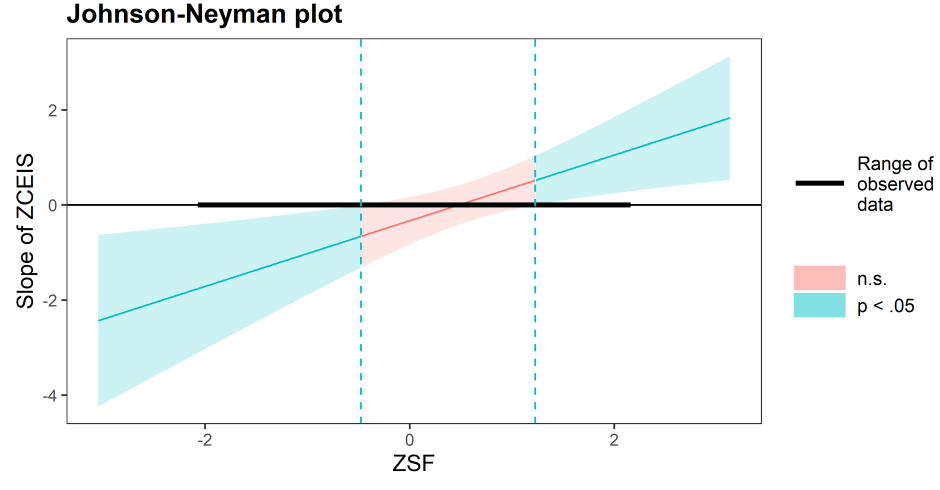

感谢 R 和 Stan 语言之美!

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