

Midterm 1

Abstract

This document is the culmination of the first half of the semester's studies in replicating published journal articles. In this document, I have replicated Table 1, Figure 2, and Figure 3 from the article "Physiological arousal and political beliefs."

Additionally, my main extension is that I have re-run the regressions for Table 1 and figure 3 using a bayesian approach, instead of the frequentist approach used in the paper.

There are some differences between these two approaches. The Bayesian approach to linear regression returns a distribution for potential values that coefficients can take on, while the frequentist simply gives a point estimate with some estimate for standard error.

This Bayesian approach is helpful: it gives us another route to check the robustness of our model (indeed, the two estimates approach each other as the sample size approaches infinity) and it allows us to inform the model about the expected value of each of the coefficients through a prior distribution.

Ultimately, the regressions run both ways reveal that the model is still robust: the coefficients in the two estimates (before and after mediation) are still significant, and are very close to one another.

Table 1

Table 1:

	<i>Dependent variable:</i>	
	Skin Conductance Reactivity (1)	Immigration Preferences (2)
Story Condition		0.386** (0.176)
Anxiety Manipulation	0.339* (0.195)	-0.277 (0.178)
Skin Conductance Reactivity when answering questions		0.232** (0.100)
Constant	0.115 (0.137)	1.983*** (0.138)
Observations	81	81
R ²	0.037	0.120
Adjusted R ²	0.025	0.086

Note:

*p<0.1; **p<0.05; ***p<0.01

Here it should be noted that there are some problems with this preceding table. Namely, the standard errors in the chart do not match up with their appropriate significance level. The 0.232 coefficient in model 2, for example, is listed as significant at the 0.05 level, instead of the 0.1 level. Do not be tricked by this error in the software.

Figure 2

Means of skin-conductance reactivity by video condition. 95% confidence intervals are show surrounding the mean.

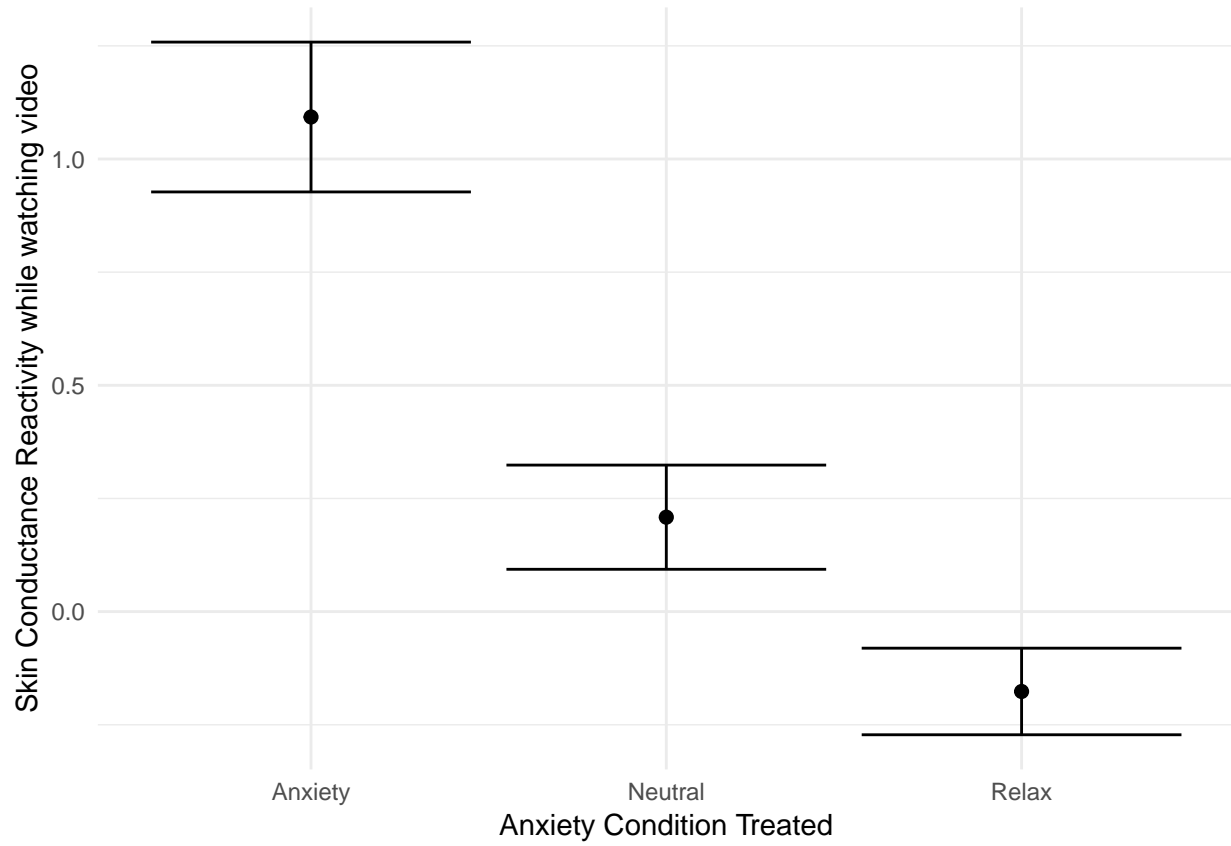


Figure 3.

Causal mediation plot. Treatment is anxiety video manipulation (compared to neutral condition), Mediator is skin conductance reactivity when answering immigration questions, Outcome is composite variable of immigration preferences.

Horizontal lines represent 90% confidence intervals for estimates.

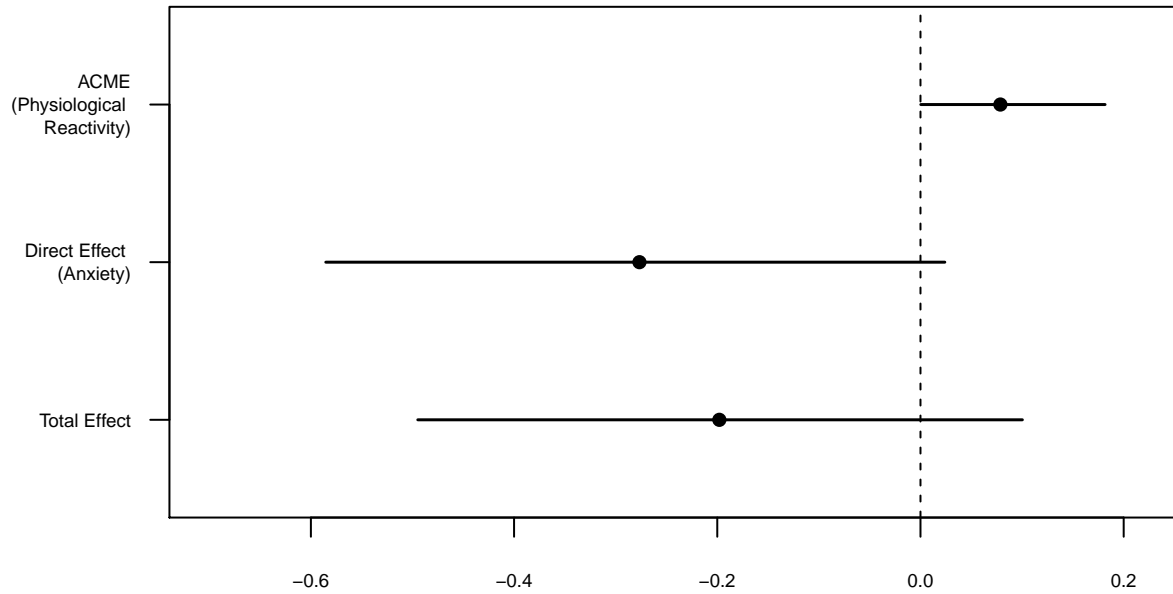


Table 1, extended

These correspond to the output to calls to a bayesian regression, same as figure 1.

Call: bayesglm(formula = scd_brad_self_report1_mean ~ anxcond, data = noRelaxCond)

Deviance Residuals: Min 1Q Median 3Q Max

-2.00688 -0.69491 0.09732 0.57739 2.03728

Coefficients: Estimate Std. Error t value Pr(>|t|)

(Intercept) 0.1158 0.1368 0.847 0.3997

anxcond 0.3373 0.1944 1.735 0.0867 . — Signif. codes: 0 ‘’ **0.001** ’’ 0.01 ’’ 0.05 ‘:’ 0.1 ‘’ 1

(Dispersion parameter for gaussian family taken to be 0.7682812)

Null deviance: 63.015 on 80 degrees of freedom

Residual deviance: 60.694 on 79 degrees of freedom (2 observations deleted due to missingness) AIC: 212.49

Number of Fisher Scoring iterations: 6

Call: bayesglm(formula = immigration ~ storycond + anxcond + scd_brad_self_report1_mean, data = noRelaxCond)

Deviance Residuals: Min 1Q Median 3Q Max

-1.70589 -0.54755 -0.07375 0.42343 2.96765

Coefficients: Estimate Std. Error t value Pr(>|t|)

(Intercept) 1.98337 0.13826 14.345 <2e-16 ** *storycond* 0.38415 0.17611 2.181 0.0322

anxcond -0.27525 0.17778 -1.548 0.1257

scd_brad_self_report1_mean 0.23183 0.09998 2.319 0.0231 *

— Signif. codes: 0 ‘’ **0.001** ’’ 0.01 ’’ 0.05 ‘:’ 0.1 ‘’ 1

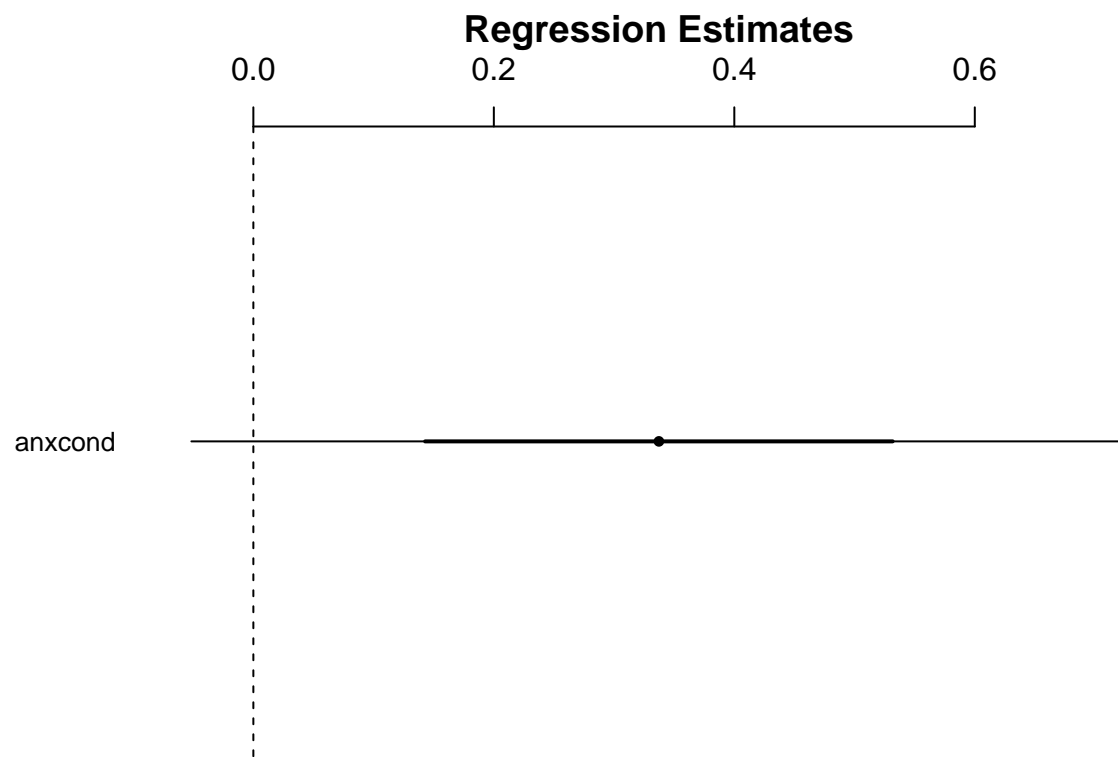
(Dispersion parameter for gaussian family taken to be 0.6066466)

Null deviance: 53.094 on 80 degrees of freedom

Residual deviance: 46.712 on 77 degrees of freedom (2 observations deleted due to missingness) AIC: 195.28

Number of Fisher Scoring iterations: 8

This is a graphical representation of the coefficients of the bayesian linear regression.



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This shows what the coefficients are, and how large the error bound is on them.

These error bars are actually quite large, however, they are still significant to a similar degree as the previous results.

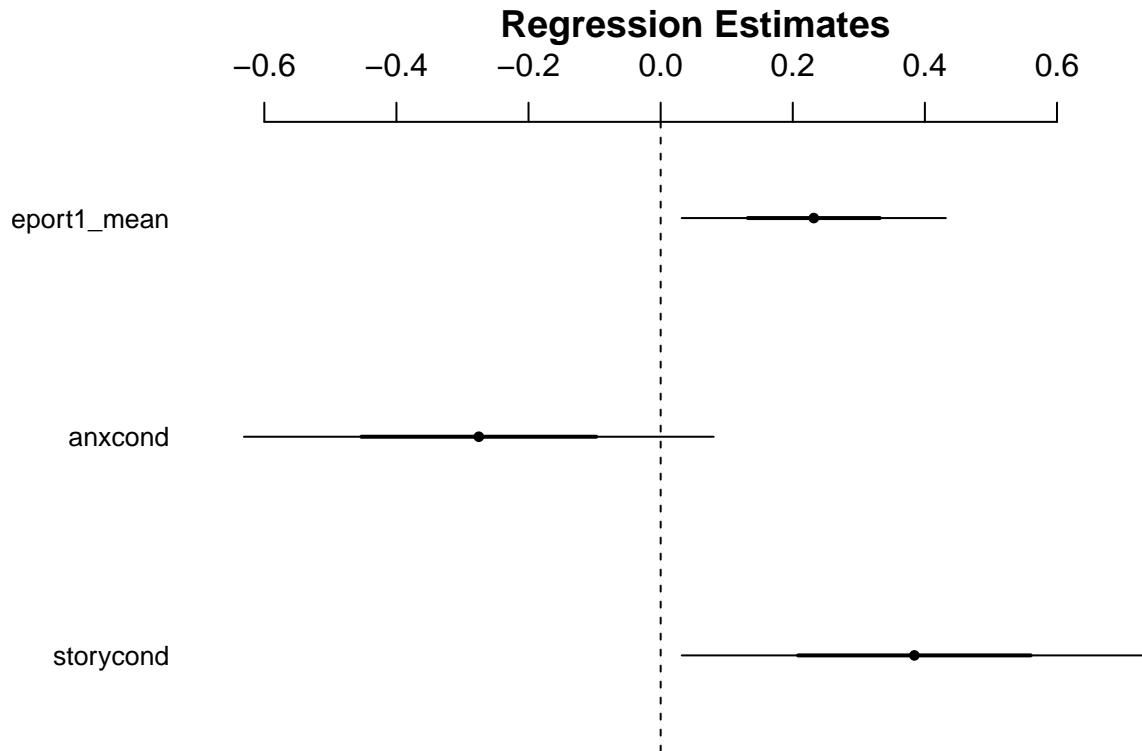
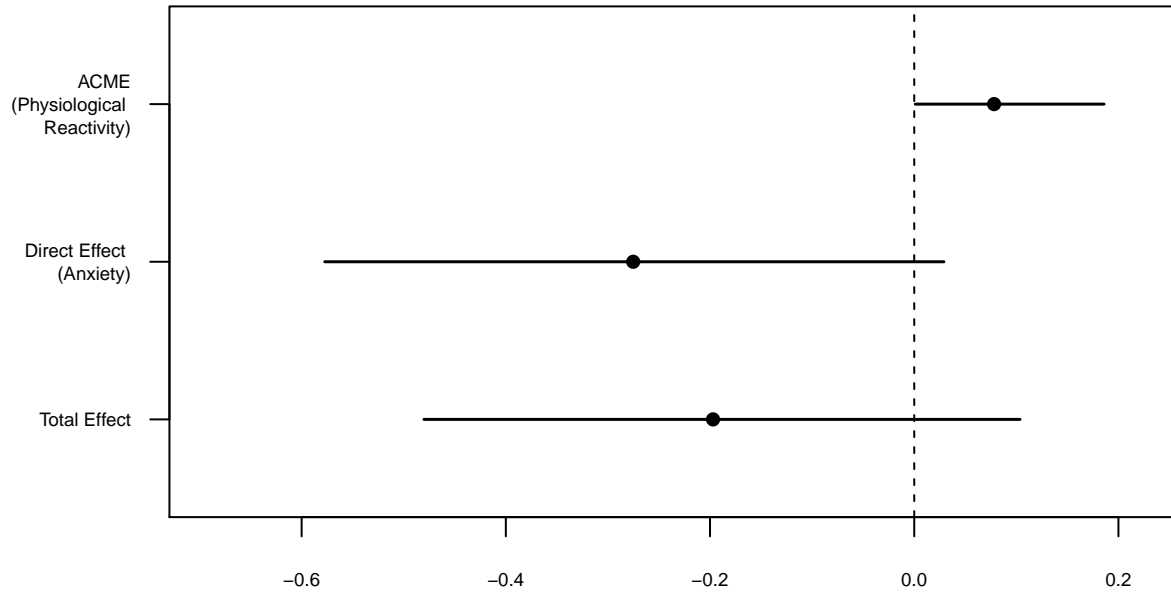


Figure 3, extended

Causal mediation plot. Treatment is anxiety video manipulation (compared to neutral condition), Mediator is skin conductance reactivity when answering immigration questions, Outcome is composite variable of immigration preferences.

Horizontal lines represent 90% confidence intervals for estimates.

The extension is that this analysis was performed with bayesian linear regression, instead of frequentist linear regression. Ultimately, the values found here coincide closely with the values computed from the frequentist analysis, and thus demonstrate a robustness of the model.



Bibliography

Hlavac, Marek (2018). stargazer: Well-Formatted Regression and Summary Statistics Tables. R package version 5.2.2. <https://CRAN.R-project.org/package=stargazer>

Renshon, Jonathan, Jooa Julia Lee, and Dustin Tingley. "Physiological arousal and political beliefs." *Political Psychology* 36.5 (2015): 569-585.