Surprise study pilot 14

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Study description

This study has the same version of PE's as pilots 10 and 11, also having video and audio only. In this pilot we 1) replaced the judge pictures with cartoon images to see whether it becomes more believable as many people believed those images were AI generated, 2) we allow participants to also choose their own avatar, again to make it more believable that the others are also real, 3) we have created a new narrative around public speaking and what is the goal of this task and added criteria they will be judged open to make them more nervous but also make it more believable if they get a rating that they cannot guess what they were judged upon at each trial (they are told the judges will receive a new criterion per trial), 4) lastly, we changed two feedback questions to inquire about believability, one of them being a scale asking "How stressful was this as a social situation?"

The Gorilla experiment is the following: https://app.gorilla.sc/admin/project/120255 The task is the following: https://app.gorilla.sc/admin/task/741126/editor?version=13

I will write this here as well for us to have, if we forget again:

Positive PE: we selected numbers from a normal distribution ranging from 12-20, added this number to the mean of the histogram.

Negative PE: we selected numbers from a normal distribution ranging from 12-20, subtracted this number to the mean of the histogram.

Big positive PE: Per judge, we added 10 to the biggest positive feedback we had generated before.

Neutral PE: we added -1, 0, 1 to the mean of the histograms

In this sample, only 17 people out of 41 had high social anxiety.

```
##
  # A tibble: 41 x 2
##
      Random_ID
                   Trial.Number
##
      <chr>
                           <int>
    1 SUPPRF00235
##
                              48
##
    2 SUPPRF01396
                              48
##
    3 SUPPRF05583
                              26
                              48
##
    4 SUPPRF07686
##
    5 SUPPRF14330
                              48
                              48
##
    6 SUPPRF17228
##
    7 SUPPRF17407
                              48
                              48
##
    8 SUPPRF19818
    9 SUPPRF23233
                              48
## 10 SUPPRF25907
                              48
## # i 31 more rows
```

Relationship between Anxiety and SubjPE

[1] "average correlation between anxiety and SubjPE: -0.0570621407466249"

	100 75 50 25 0	UPPRF002: R = 0.1 -80-3020 70	100 75 50 25 0	UPPRF0139 = -0.45 -80-3020 70	50 25 0	JPPRF0558 = -0.07 -80-3020 70	100 75 50 25 0	UPPRF0768 = -0.26 -80-3020 70	100 75 50 25 0	UPPRF143: = 0.01 -80-3020 70	100 75 50 25 0	UPPRF1722 = -0.13 -80-3020 70	100 75 50 25 0	UPPRF174(R = 0 -80-3020 70		
	100 75 50 25 0	JPPRF1981 : -0.03	100 75 50 25 0	UPPRF2323 R = 0	100 75 50 25 0	JPPRF2590 = 0.08	100 75 50 25 0	JPPRF272(=	100 75 50 25 0	UPPRF2726 = 0.01	100 75 50 25 0	UPPRF2744 = -0.25	100 75 50 25 0	UPPRF2896 = 0.32		
iety	100 75 50 25 0	-80-3020 70 UPPRF2991 -0.3 -80-3020 70	100 75 50 25 0	-80-3020 70 UPPRF3091 = -0.03 -80-3020 70	100 75 50 25 0	JPPRF332: R = 0.1 -80-3020 70	100 75 50 25 0	-80-3020 70 JPPRF3387 = 0.03 -80-3020 70	100 75 50 25 0	-80-3020 70 UPPRF374! = -0.07 -80-3020 70	100 75 50 25 0	-80-3020 70 UPPRF3841 = -0.05 -80-3020 70	100 75 50 25 0	-80-3020 70 UPPRF394: = 0.23 -80-3020 70	Soc	ial_Anxiety high low
Anxiety	100 75 50 25 0	UPPRF4021 = -0.14 -80-3020 70	100 75 50 25 0	UPPRF4399 =	100 75 50 25 0	JPPRF440 ² = 0.21 -80-3020 70	100 75 50 25 0	UPPRF4931 R = 0 -80-3020 70	100 75 50 25 0	UPPRF5674 = -0.15 -80-3020 70	100 75 50 25 0	UPPRF6239 = -0.04 -80-3020 70	100 75 50 25 0	UPPRF649: = 0.19 -80-3020 70	alph	na 0.3
	100 75 50 25 0	UPPRF6692 = -0.13 -80-3020 70	100 75 50 25 0	UPPRF677: = 0.08 -80-3020 70	100 75 50 25 0	JPPRF709' = -0.28 -80-3020 70	100 75 50 25 0	UPPRF7127 = -0.06 -80-3020 70	100 75 50 25 0	UPPRF795! = 0.27 -80-3020 70	100 75 50 25 0	JPPRF8012 = -0.13 -80-3020 70	100 75 50 25 0	UPPRF8441 = -0.15 -80-3020 70		
	100 75 50 25 0	UPPRF8861 = -0.06 -80-3020 70	100 75 50 25 0	UPPRF9138 =0.51 -80-3020 70	100 75 50 25 0	JPPRF9536 -0.14 -80-3020 70	100 75 50 25 0	UPPRF959! = -0.39 -80-3020 70	100 75 50 25 0	UPPRF967(R = NA -80-3020 70	100 75 50 25 0	JPPRF9954 = -0.09 -80-3020 70				

SubjPE: feedback - prediction

Relationship between Mood and SubjPE

[1] "average correlation between mood and SubjPE: 0.169860303615549"

100 75 = 0.08 100 = 0.65 100 = 0.41 100 = 0.56 100 100	
25 25 25 25 25 25 25 25	
00 0000 70	
-80-3020 70 -80-3020 70 -80-3020 70 -80-3020 70 -80-3020 70 -80-3020 70 -80-3020 70	
UPPRF1981 UPPRF232; JPPRF259(UPPRF272(UPPRF272(UPPRF2744 UPPRF289(100 0.26 100 0.44 100 0.02 100 0.02 100 0.44 100 0	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	
-80-3020 70	
	cial_Anxiety
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	high
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	low
-80-3020 70 -80-30	
UPPRF4021 UPPRF439\$	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	ha
-0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.3
UPPRESSOR UPPRESSOR UPPRESSOR UPPRESSOR UPPRESSOR UPPRESSOR	0.5
UPPRF6692 UPPRF6772 JPPRF7091 UPPRF7127 UPPRF7955 UPPRF8012 UPPRF8441	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	
-80-3020 70 -80-3020 70 -80-3020 70 -80-3020 70 -80-3020 70 -80-3020 70 -80-3020 70	
UPPRF8861 UPPRF9138 JPPRF9538 UPPRF9598 UPPRF9670 UPPRF9954	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	
-80-3020 70	

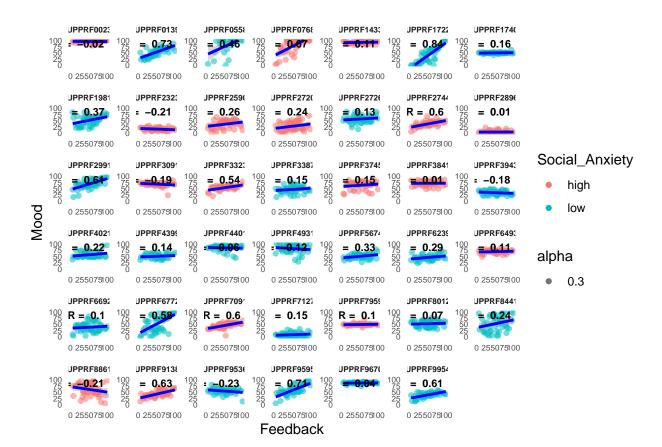
SubjPE: feedback - prediction

Relationship between Mood and feedback

The relationship between mood and feedback seems to be stronger than mood and subjective PE (0.24 vs 0.17), so it seems people may care more about the feedback as receiving reward or punishment, rather than social PE? The relationship between subjective PE with both anxiety and mood has been the weakest across all pilots. We need to make sure it is only because of changing the pictures of virtual players, maybe by changing the narrative they would assume that the other players are also learning how to do public speaking (less intimidating than someone who is an expert?).

To be sure, I wonder if we want to repeat the pilot and just replace the images?

[1] "average correlation between mood and feedback: 0.237770542807818"



Relationship between Mood and prediction

[1] "average correlation between mood and prediction: 0.119584769789578"

		JPPRF0023	UPPRF0139	JPPRF0558	JPPRF0768	UPPRF1433	JPPRF1722	JPPRF1740	
	100 75 50 25 0	= 0.34 100 75 50 25 0	= 0.32 100 75 50 25 0	0.21 100 75 50 25 0	= 0.36 100 75 50 25 0	-0.07 100 75 50 25 0	= 0.34 100 75 50 25 0	= 0.17	
		0 255075100	0 255075100	0 255075100	0 255075100	0 255075100	0 255075100	0 255075100	
	100 75 50 25	JPPRF1981	UPPRF232	JPPRF2590	JPPRF272(JPPRF2726	JPPRF2744	UPPRF289€	
		= 0.15 100 75 50 25	= -0.23 100 75 50 25 0	= 0.43 100 75 50 25 0	= 0.33 100 75 50 25 0	0.04 100 75 50 25 0	= 0.23 100 50 50 25 0	= 0.33	
	25 0	25	25	25	25	25	25		
		0 255075100	0 255075100	0 255075100	0 255075100	0 255075100	0 255075100	0 255075100	0
		JPPRF2991	UPPRF3091	JPPRF332:	JPPRF3387	UPPRF374!	JPPRF3841	UPPRF3943	Social_Anxiety
	100 75 50 25 0	=-0.1 100 75 50 25 0	-0.22 100 75 50 25 0	= 0.04 100 75 50 25 0	= 0.11 100 75 50 25	R=0.1 100 75 50 25 0	100 75 50 25 0	= 0.05	high
$\overline{}$	25 0				-				• low
Mood		0 255075100	0 255075100	0 255075100	0 255075100	0 255075100	0 255075100	0 255075100	IOW
Ĭ	400	JPPRF4021	UPPRF4399	JPPRF4401	JPPRF4931	UPPRF5674	JPPRF6239	UPPRF6493	
	100 75 50 25 0	25.16 100 50 25 0	= 0.32 100 75 50 25 0	= 0.74 100 75 50 25 0	-0.03 100 75 50 25 0	R=0 100 75 50 25 0	= 0.11 100 75 50 25 0	= _0.14	alpha
		0 255075100	0 255075100	0 255075100	0 255075100	0 255075100	0 255075100	0 255075100	• 0.3
		JPPRF6692	JPPRF6772	JPPRF709 ⁻	JPPRF7127	JPPRF7959	JPPRF8012	UPPRF8441	
	100 75 50 25 0	-0.13 100 75 50 25 0	= 0.24 100 75	= 0.07 100 75	= -0.07 100 75	= -0.11 100 75 50 25 0	0.12 100 75 50 25 0	-0.07	
	25 0	25 0	0.24 100 75 50 25 0	= 0.07 100 75 50 25 0	: −0.07 100 −0.07 75 50 25 0	25	25 0	1	
		0 255075100	0 255075100	0 255075100	0 255075100	0 255075100	0 255075100	0 255075100	
		JPPRF8861	UPPRF9138	JPPRF9536	JPPRF959	UPPRF967(JPPRF995₄		
	100 75 50 25 0	-0.14 100 75 50 25	-0.05 100 75 50 25 0	= 0.43 100 75 50 25 0	0.16 100 75 50 25 0	R=0 100 75 50 25 0	= 0.37		
	0	0 255075100	0 255075100	0 255075100	0 255075100	0 255075100	0 255075100		
				Р	rediction				

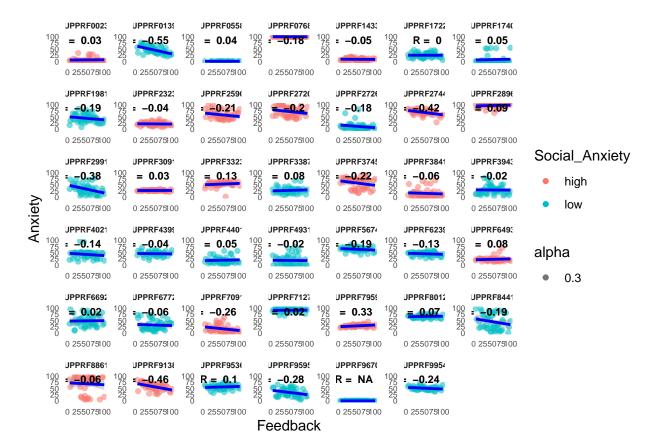
Relationship between Anxiety and prediction

[1] "average correlation between anxiety and prediction: -0.0520117558366197"

	100 75 50 25 0	UPPRF002; = -0.37 19 0 255075100	00 75 50 25 0	UPPRF0138 =	JPPRF0558 R = 0.1 100 75 500 25 0 255075100	JPPRF0768 R = 0 100 75 50 25 0 255075100	UPPRF143: = -0.09	UPPRF1722 R = 0.1 75 50 0 255075100	UPPRF174(= 0.07 0 255075100	
	100 75 50 25 0	UPPRF1981 = -0.24 19	00 75 50 25 0	UPPRF232: = -0.1 100 75 50 25 0 0 255075100	JPPRF259(- 0.46	UPPRF272(= -0.34	UPPRF2726 = -0.24	UPPRF2744 = -0.22 100 75 50 225 0 0 255075100	UPPRF2896 = -0.4 0 255075100	
Mood	100 75 50 25 0	UPPRF2991 = 0.05 19 0 255075100	00 75 50 25 0	UPPRF3091 = 0.07 100 75 50 25 0 25 50 75 0 0 0 25 0 0 0 0 0 0 0 0 0	JPPRF332: = 0.11 100 75 50 25 00 255075100	UPPRF338; = 0.06 100 75 50 25 0 255075100	UPPRF374! = -0.17	UPPRF3841 R = 0 100 75 50 25 0 0 255075100	UPPRF394: -0.38 0 255075100	Social_Anxiety high low
M	100 75 50 25 0	UPPRF4021 = 0.01 19 0 255075100	00 75 50 25 0	UPPRF4399 = 0.12	JPPRF440' : -0.46	UPPRF4931 = -0.02	UPPRF567₄ -0.06 100 75 50 25 0 255075100	UPPRF623\$ =0.18	UPPRF649: = -0.19 0 255075100	alpha • 0.3
	100 75 50 25 0	UPPRF6692 = 0.34 19 0 255075100	00 75 50 25 0	UPPRF6772 -0.13	JPPRF709' = 0.01	UPPRF712i 0.13 100 75 50 20 0 255075100	UPPRF795! = 0.14	UPPRF8012 - 0.23	UPPRF8441 = 0.01 0 255075100	
	100 75 50 25 0	UPPRF8861 = 0.01 19 0 255075100	00 75 50 25 0	UPPRF9138 = 0.28	0 255075100	### 100 100 75 50 50 0 255075100 rediction	UPPRF967(R = NA 100 75 50 25 0 255075100	UPPRF9954 = -0.22 0 255075100		

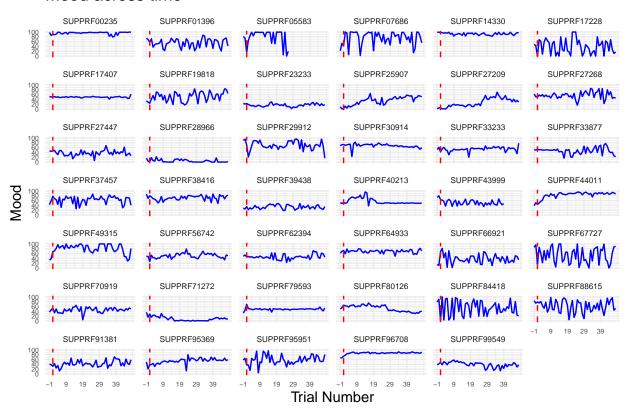
Relationship between Anxiety and feedback

[1] "average correlation between anxiety and feedback: -0.0912289783912545"



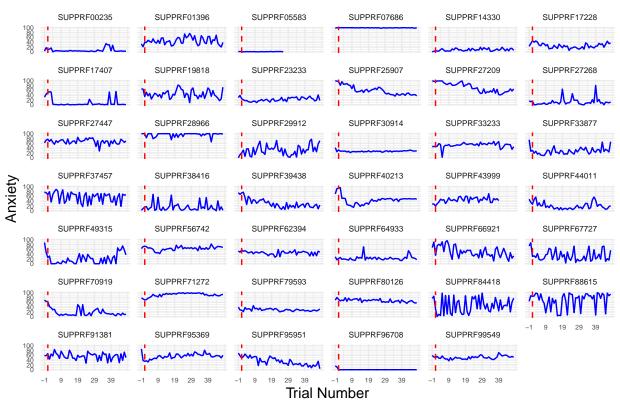
Mood over time

Mood across time



Anxiety over time

Anxiety across time



Participants' feedback

In the feedback we received from people, some people mentioned they did not like being watched and some mentioned since they did not see the other person, they did not care and did not think they were real and did not influence how they felt. We did have a few people who mentioned "the observer" or "they" when trying to descrive the virtual players. But overall, seeing how weaker the relationship is, I don't think having the cartoon images helps.

But since in this new pilot we have had several changes at once, shall we repeat the pilot with the new narrative but with the old pictures we had?

Anxiety- SubjPE correlations

Anxiety- Feedback correlations

If we wanted to run this again, we need the file "avatar_pilot_task_with_feedback.csv" which Elena has but since it has identifiable data we have not put it on Github.

Mood - SubjPE correlations

Mood-Feedback correlations

LME models for Mood and SubjPE

I will now look at the best LME models including feedback as well. But since subjective PE does include feedback, I will either only include feedback or SubjPE.

When looking at subjective PE, the best model is Mood \sim SubjPE + (SubjPE | Random_ID) with an AIC of 16192.33 When including feedback the best model is Mood \sim feedback + (feedback | Random_ID) with an AIC of 16014.14

```
## Linear mixed model fit by REML ['lmerMod']
  Formula: Response_H ~ Response_SubjPE + (1 | Random_ID)
      Data: final df14
## Control: lmerControl(optimizer = "bobyqa")
## REML criterion at convergence: 16325
##
## Scaled residuals:
##
       Min
                10 Median
                                3Q
                                        Max
##
  -5.2795 -0.4758 0.0368 0.5210
                                    3.7862
##
## Random effects:
##
   Groups
                          Variance Std.Dev.
              Name
   Random_ID (Intercept) 452.6
                                    21.28
   Residual
                          241.3
                                    15.54
## Number of obs: 1939, groups:
                                 Random_ID, 41
##
## Fixed effects:
##
                   Estimate Std. Error t value
## (Intercept)
                   53.48397
                               3.34176
## Response_SubjPE 0.11018
                               0.01438
                                          7.663
##
## Correlation of Fixed Effects:
##
               (Intr)
## Rspns_SbjPE -0.013
## Linear mixed model fit by REML ['lmerMod']
## Formula: Response_H ~ Response_SubjPE + (Response_SubjPE | Random_ID)
      Data: final df14
## Control: lmerControl(optimizer = "bobyqa")
## REML criterion at convergence: 16180.3
##
## Scaled residuals:
##
       Min
                10 Median
                                3Q
                                        Max
  -5.6350 -0.4948 0.0411 0.5136 3.7705
##
## Random effects:
                              Variance Std.Dev. Corr
##
   Groups
              Name
                              407.58042 20.1886
##
   Random_ID (Intercept)
                                                  -0.06
##
              Response_SubjPE
                                0.06984 0.2643
   Residual
                              213.60721 14.6153
## Number of obs: 1939, groups: Random_ID, 41
## Fixed effects:
```

```
##
                   Estimate Std. Error t value
                  53.14198
                               3.17504 16.737
## (Intercept)
## Response_SubjPE 0.14283
                               0.04369
##
## Correlation of Fixed Effects:
##
               (Intr)
## Rspns SbjPE -0.059
## Linear mixed model fit by REML ['lmerMod']
## Formula: Response_H ~ Response_SubjPE * mini_SPIN_total + (Response_SubjPE |
      Random ID)
##
      Data: final_df14
## Control: lmerControl(optimizer = "bobyqa")
## REML criterion at convergence: 16183.4
##
## Scaled residuals:
##
      Min
             1Q Median
                                3Q
                                       Max
## -5.6484 -0.4944 0.0453 0.5159 3.7828
##
## Random effects:
## Groups
              Name
                              Variance Std.Dev. Corr
##
   Random_ID (Intercept)
                              417.22393 20.426
##
              Response_SubjPE 0.06915 0.263
                                                 -0.06
## Residual
                              213.61570 14.616
## Number of obs: 1939, groups: Random_ID, 41
## Fixed effects:
##
                                   Estimate Std. Error t value
## (Intercept)
                                   52.45925
                                               7.07615
                                                         7.414
## Response_SubjPE
                                    0.24286
                                               0.09611
                                                         2.527
## mini_SPIN_total
                                    0.12053
                                               1.13898
                                                         0.106
## Response_SubjPE:mini_SPIN_total -0.01806
                                               0.01548 - 1.167
## Correlation of Fixed Effects:
               (Intr) Rs_SPE m_SPIN
## Rspns_SbjPE -0.060
## mn_SPIN_ttl -0.891 0.052
## R_SPE:_SPIN 0.052 -0.892 -0.057
## Linear mixed model fit by REML ['lmerMod']
## Formula: Response_H ~ Response_fdbk + (1 | Random_ID)
      Data: final_df14
## Control: lmerControl(optimizer = "bobyqa")
## REML criterion at convergence: 16239.6
##
## Scaled residuals:
            1Q Median
                                3Q
                                       Max
## -5.1198 -0.4919 0.0402 0.5467 3.4963
##
## Random effects:
## Groups
                          Variance Std.Dev.
             Name
## Random_ID (Intercept) 418.6
```

```
## Residual
                          231.1
                                   15.20
## Number of obs: 1939, groups: Random_ID, 41
## Fixed effects:
                 Estimate Std. Error t value
                44.58492
                            3.30207
## (Intercept)
## Response_fdbk 0.17784
                             0.01459
## Correlation of Fixed Effects:
##
               (Intr)
## Respns_fdbk -0.229
## Linear mixed model fit by REML ['lmerMod']
## Formula: Response_H ~ Response_fdbk + (Response_fdbk | Random_ID)
      Data: final_df14
## Control: lmerControl(optimizer = "bobyqa")
## REML criterion at convergence: 16002.1
## Scaled residuals:
      Min
               1Q Median
                                3Q
                                       Max
## -5.5575 -0.4904 0.0469 0.5256 3.9285
##
## Random effects:
                            Variance Std.Dev. Corr
  Groups
             Name
##
   Random_ID (Intercept)
                            608.7952 24.6738
                             0.0673 0.2594
##
              Response_fdbk
                                             -0.56
## Residual
                            194.2163 13.9362
## Number of obs: 1939, groups: Random_ID, 41
## Fixed effects:
                Estimate Std. Error t value
## (Intercept)
                44.30178
                             3.92932 11.275
## Response_fdbk 0.18269
                             0.04269
                                       4.279
##
## Correlation of Fixed Effects:
##
               (Intr)
## Respns_fdbk -0.578
## Linear mixed model fit by REML ['lmerMod']
## Formula: Response_H ~ Response_fdbk * mini_SPIN_total + (Response_fdbk |
##
      Random_ID)
      Data: final_df14
##
## Control: lmerControl(optimizer = "bobyqa")
## REML criterion at convergence: 16004.8
##
## Scaled residuals:
            1Q Median
                                3Q
                                       Max
## -5.5575 -0.4866 0.0457 0.5265 3.9442
##
## Random effects:
## Groups
             Name
                            Variance Std.Dev. Corr
## Random_ID (Intercept)
                            614.304 24.7852
```

```
Response_fdbk 0.066 0.2569 -0.55
## Residual
                           194.212 13.9360
## Number of obs: 1939, groups: Random_ID, 41
## Fixed effects:
##
                                Estimate Std. Error t value
## (Intercept)
                                38.02799
                                            8.69603
                                                     4.373
## Response_fdbk
                                 0.29286
                                            0.09328
                                                      3.139
## mini_SPIN_total
                                 1.13193
                                            1.39885
                                                     0.809
## Response_fdbk:mini_SPIN_total -0.01988
                                            0.01500 -1.325
## Correlation of Fixed Effects:
              (Intr) Rspns_ m_SPIN
## Respns_fdbk -0.568
## mn_SPIN_ttl -0.891 0.506
## Rsp_:_SPIN_ 0.506 -0.891 -0.568
## [1] 16333.03
## [1] 16192.33
## [1] 16199.38
## [1] 16247.58
## [1] 16014.14
```

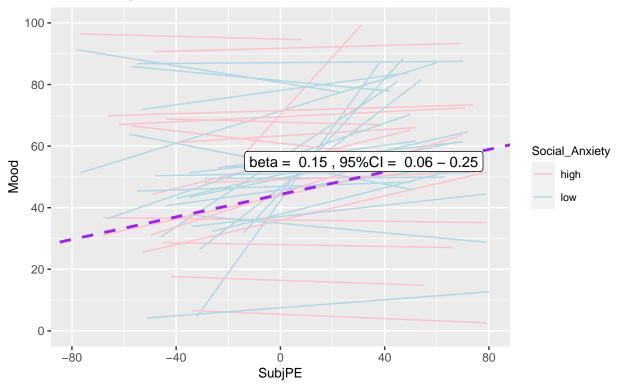
[1] 16020.84

Individual plots with LME for Mood with SubjPE

When looking at subjective PE, the best model is Mood \sim SubjPE + (SubjPE | Random_ID) with an AIC of 16192.33

Relationship between Mood and subjective PE

estimated slopes of the association in n = 41

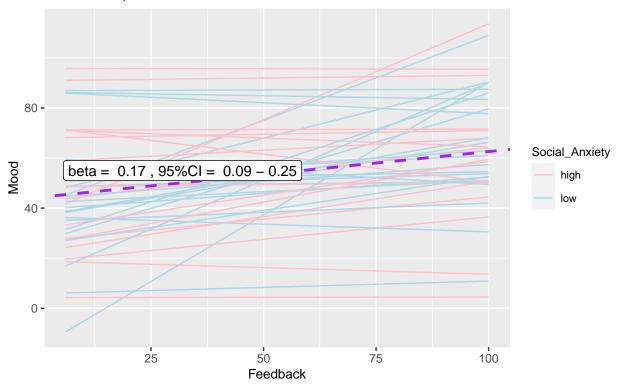


Individual plots with LME for Mood with feedback instead of SubjPE $\,$

When including feedback the best model is Mood \sim feedback + (feedback | Random_ID) with an AIC of 16014.14

Relationship between Mood and Feedback

estimated slopes of the association in n = 41



LME models for Anxiety and SubjPE

When looking at subjective PE, the best model is Anxiety \sim SubjPE + (SubjPE | Random_ID) with an AIC of 16097.78 When including feedback the best model is Anxiety \sim feedback + (Random_ID) with an AIC of 16084.09

```
## Linear mixed model fit by REML ['lmerMod']
## Formula: Response_Ax ~ Response_SubjPE + (1 | Random_ID)
      Data: final_df14
## Control: lmerControl(optimizer = "bobyqa")
## REML criterion at convergence: 16090
## Scaled residuals:
      Min
                1Q Median
                                3Q
                                       Max
## -4.4122 -0.4978 -0.0214 0.4007 4.6974
##
## Random effects:
                          Variance Std.Dev.
  Groups
              Name
  Random_ID (Intercept) 641.0
                                   25.32
## Residual
                          211.7
                                   14.55
## Number of obs: 1939, groups: Random_ID, 41
##
## Fixed effects:
##
                   Estimate Std. Error t value
## (Intercept)
                   40.60638
                               3.96800 10.233
## Response_SubjPE -0.03483
                               0.01347 - 2.585
## Correlation of Fixed Effects:
               (Intr)
## Rspns_SbjPE -0.010
## Linear mixed model fit by REML ['lmerMod']
## Formula: Response Ax ~ Response SubjPE + (Response SubjPE | Random ID)
     Data: final_df14
## Control: lmerControl(optimizer = "bobyqa")
## REML criterion at convergence: 16085.8
##
## Scaled residuals:
      Min
              1Q Median
                                ЗQ
                                       Max
## -4.4263 -0.4982 -0.0235 0.3904 4.7073
##
## Random effects:
                              Variance Std.Dev. Corr
## Groups
              Name
##
   Random_ID (Intercept)
                              6.358e+02 25.21456
##
              Response_SubjPE 3.349e-03 0.05787 -0.14
  Residual
                              2.097e+02 14.47930
## Number of obs: 1939, groups: Random_ID, 41
## Fixed effects:
##
                   Estimate Std. Error t value
## (Intercept)
                   40.59479
                               3.95308 10.269
```

```
## Response_SubjPE -0.03332
                              0.01638 -2.034
##
## Correlation of Fixed Effects:
##
               (Intr)
## Rspns_SbjPE -0.087
## optimizer (bobyqa) convergence code: 0 (OK)
## Model is nearly unidentifiable: very large eigenvalue
## - Rescale variables?
## Linear mixed model fit by REML ['lmerMod']
## Formula: Response_Ax ~ Response_SubjPE * mini_SPIN_total + (Response_SubjPE |
##
      Random_ID)
##
      Data: final_df14
## Control: lmerControl(optimizer = "bobyqa")
## REML criterion at convergence: 16088
## Scaled residuals:
      Min
            1Q Median
                               30
                                       Max
## -4.4369 -0.4909 -0.0227 0.3936 4.7108
##
## Random effects:
## Groups
             Name
                             Variance Std.Dev. Corr
  Random ID (Intercept)
                             6.066e+02 24.62886
             Response_SubjPE 3.448e-03 0.05872 -0.21
##
                              2.097e+02 14.47985
## Number of obs: 1939, groups: Random_ID, 41
## Fixed effects:
##
                                    Estimate Std. Error t value
## (Intercept)
                                   28.030647
                                             8.508686
                                                          3.294
## Response_SubjPE
                                              0.036886
                                   -0.059781
                                                        -1.621
## mini_SPIN_total
                                    2.277306
                                              1.369265
                                                          1.663
## Response_SubjPE:mini_SPIN_total 0.004817
                                              0.005937
                                                          0.811
##
## Correlation of Fixed Effects:
               (Intr) Rs_SPE m_SPIN
##
## Rspns_SbjPE -0.130
## mn SPIN ttl -0.891 0.113
## R_SPE:_SPIN 0.113 -0.895 -0.122
## optimizer (bobyqa) convergence code: 0 (OK)
## Model is nearly unidentifiable: very large eigenvalue
## - Rescale variables?
## Linear mixed model fit by REML ['lmerMod']
## Formula: Response_Ax ~ Response_fdbk + (1 | Random_ID)
      Data: final_df14
## Control: lmerControl(optimizer = "bobyqa")
## REML criterion at convergence: 16076.1
## Scaled residuals:
      Min 1Q Median
## -4.4537 -0.5042 -0.0314 0.4204 4.6990
```

```
##
## Random effects:
## Groups
             Name
                         Variance Std.Dev.
## Random_ID (Intercept) 633.2
                                   25.16
## Residual
                          210.2
                                   14.50
## Number of obs: 1939, groups: Random_ID, 41
## Fixed effects:
##
                Estimate Std. Error t value
                            4.00926 10.921
## (Intercept)
                43.78428
## Response_fdbk -0.06324
                            0.01392 -4.545
## Correlation of Fixed Effects:
##
               (Intr)
## Respns_fdbk -0.180
## Linear mixed model fit by REML ['lmerMod']
## Formula: Response_Ax ~ Response_fdbk + (Response_fdbk | Random_ID)
     Data: final_df14
## Control: lmerControl(optimizer = "bobyqa")
## REML criterion at convergence: 16072.6
##
## Scaled residuals:
##
      Min 1Q Median
                               3Q
                                       Max
## -4.4765 -0.4987 -0.0323 0.4086 4.7191
##
## Random effects:
##
  Groups
                            Variance Std.Dev. Corr
             Name
   Random_ID (Intercept)
                            6.807e+02 26.0911
##
             Response_fdbk 3.284e-03 0.0573 -0.36
                            2.084e+02 14.4348
## Residual
## Number of obs: 1939, groups: Random_ID, 41
## Fixed effects:
                Estimate Std. Error t value
## (Intercept) 43.75779 4.15102 10.541
## Response_fdbk -0.06277
                          0.01651 -3.802
##
## Correlation of Fixed Effects:
               (Intr)
## Respns_fdbk -0.339
## optimizer (bobyqa) convergence code: 0 (OK)
## Model is nearly unidentifiable: very large eigenvalue
## - Rescale variables?
## Linear mixed model fit by REML ['lmerMod']
## Formula: Response_Ax ~ Response_fdbk * mini_SPIN_total + (Response_fdbk |
##
      Random ID)
      Data: final_df14
##
## Control: lmerControl(optimizer = "bobyqa")
## REML criterion at convergence: 16075.8
##
```

```
## Scaled residuals:
      Min 1Q Median
                             3Q
                                      Max
## -4.4812 -0.4974 -0.0344 0.4075 4.7205
##
## Random effects:
## Groups Name
                           Variance Std.Dev. Corr
## Random_ID (Intercept)
                           650.93437 25.5134
             Response_fdbk 0.00354 0.0595 -0.35
##
## Residual
                           208.36408 14.4348
## Number of obs: 1939, groups: Random_ID, 41
## Fixed effects:
                                 Estimate Std. Error t value
## (Intercept)
                                30.482216 8.951108 3.405
## Response_fdbk
                                -0.052512
                                           0.036875 -1.424
## mini_SPIN_total
                                 2.397379
                                           1.440078
                                                     1.665
## Response_fdbk:mini_SPIN_total -0.001848
                                           0.005906 -0.313
##
## Correlation of Fixed Effects:
              (Intr) Rspns m SPIN
## Respns_fdbk -0.338
## mn_SPIN_ttl -0.891 0.301
## Rsp_:_SPIN_ 0.302 -0.892 -0.338
## optimizer (bobyqa) convergence code: 0 (OK)
## Model is nearly unidentifiable: very large eigenvalue
## - Rescale variables?
## [1] 16098.03
## [1] 16097.78
## [1] 16104.05
## [1] 16084.09
## [1] 16084.61
```

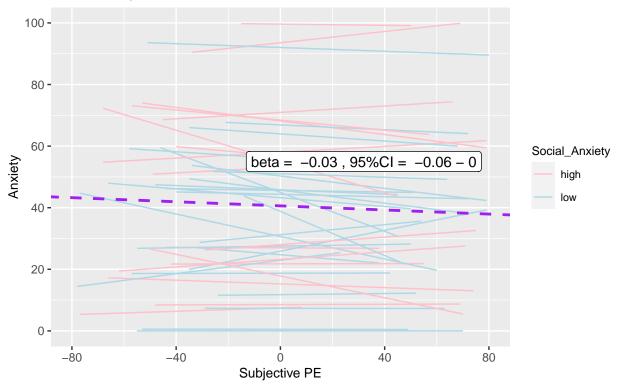
[1] 16091.8

Individual plots with LME for Anxiety with SubjPE

When looking at subjective PE, the best model is Anxiety \sim SubjPE + (SubjPE | Random_ID) with an AIC of 16097.78

Relationship between Anxiety and subjective PE

estimated slopes of the association in n = 41

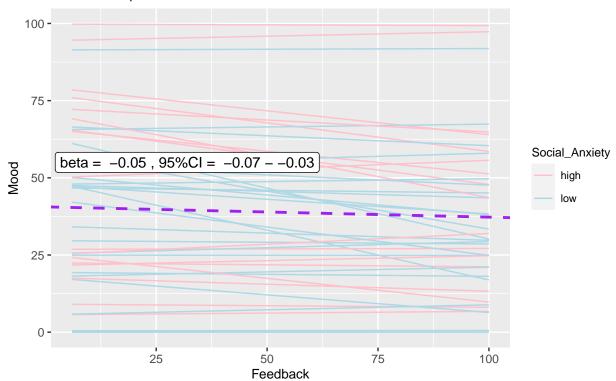


Individual plots with LME for Anxiety with feedback instead of SubjPE $\,$

When including feedback the best model is Anxiety \sim feedback + (Random_ID) with an AIC of 16084.09

Relationship between Anxiety and Feedback

estimated slopes of the association in n = 41



ICC for anxiety

we will now look at the ICC outcome for anxiety The ICC for anxiety is 0.75, which is moderate/good according to guidelines by Koo and Li (2016): below 0.50: poor between 0.50 and 0.75: moderate between 0.75 and 0.90: good above 0.90: excellent

```
## [1] "lmer for anxiety with just the intercept"
## [1] 0.7489496

## 2.5 % 97.5 %
## .sig01 20.27662 31.43409
## .sigma 14.12142 15.04917
## (Intercept) 32.68154 48.32104
```

ICC for mood

The ICC for mood is 0.42, which is lower than anxiety and is actually within the poor category, according to guidelines by Koo and Li (2016): below 0.50: poor between 0.50 and 0.75: moderate between 0.75 and 0.90: good above 0.90: excellent

```
## [1] "lmer for mood with just the intercept"
## [1] 0.6271569

## 2.5 % 97.5 %
## .sig01 16.46445 25.58591
## .sigma 15.29259 16.29728
## (Intercept) 47.43910 60.19157
```