# Surprise study pilot 14

Marjan Biria

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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 SUPPRF01407
##
                              48
##
    2 SUPPRF02465
                              48
##
    3 SUPPRF05137
                              48
                              26
##
    4 SUPPRF05583
##
    5 SUPPRF05702
                              48
    6 SUPPRF06407
                              48
##
##
    7 SUPPRF08160
                              39
                              48
##
    8 SUPPRF08392
    9 SUPPRF08503
                              48
## 10 SUPPRF11118
                              48
## # i 31 more rows
```

### Relationship between Anxiety and SubjPE

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

		JPPRF0140	UPPRF0246	JPPRF051:	JPPRF0558	UPPRF0570	JPPRF0640	JPPRF0816	
	100 75 50 25 0	= -0.45	100 75 50 25 0	100 75 50 25 0	<sup>100</sup> / <sub>75</sub> = <b>-0.07</b> <sup>50</sup> / <sub>25</sub>	<sup>100</sup> / <sub>75</sub> <b>R = NA</b> <sup>50</sup> / <sub>25</sub>	100 75 = <b>0.19</b> 50 25	100 75 50 25 0	
		-80-3020 70	-80-3020 70	-80-3020 70	-80-3020 70	-80-3020 70	-80-3020 70	-80-3020 70	
		JPPRF0839	UPPRF0850	JPPRF1111	JPPRF1116	UPPRF1311	JPPRF1471	UPPRF1483	
	100 75 50 25	= 0.01	100 75 50 25 0	<sup>100</sup> / <sub>75</sub> : <b>-0.03</b> <sup>50</sup> / <sub>25</sub>	<sup>100</sup> / <sub>75</sub> = <b>-0.14</b> <sup>50</sup> / <sub>25</sub>	100 75 50 25	100 75 50 25 0	<sup>100</sup> / <sub>75</sub> = <b>-0.28</b> <sup>50</sup> / <sub>25</sub>	
	-	-80-3020 70	-80-3020 70	-80-3020 70	-80-3020 70	-80-3020 70	-80-3020 70	-80-3020 70	
		JPPRF1818	UPPRF2702	JPPRF2728	JPPRF2858	UPPRF3327	JPPRF343(	UPPRF372	Social_Anxiety
	100 75 50 25	= 0.21	<sup>100</sup> <sub>75</sub> <sub>75</sub> <sub>80</sub> <sub>25</sub> <sub>25</sub>	100 75 50 25 0	100 75 50 25 0	100 75 50 25 0	100 75 50 25 0	100 75 50 25 0	<ul><li>high</li></ul>
>	25 0		25	25	25	25	25	25 0	
Anxiety	-	-80-3020 70	-80-3020 70	-80-3020 70	-80-3020 70	-80-3020 70	-80-3020 70	-80-3020 70	<ul><li>low</li></ul>
ŝ		JPPRF4267	UPPRF4314	JPPRF4668	JPPRF5139	JPPRF5499	JPPRF5499	UPPRF5529	
4	100								
	100 75 50 25 0	= <b>-0.2</b> 6	100 75 50 25 0	<sup>100</sup> / <sub>75</sub> : <b>-0.13</b> <sup>50</sup> / <sub>25</sub>	100 75 = <b>-0.13</b> 50 25	<sup>100</sup> / <sub>75</sub> = <b>-0.39</b> <sup>50</sup> / <sub>25</sub>	100 75 8 <b>R = 0</b>	100 75 50 25 0	alpha
	0	= <b>-0.26</b> -80-3020 70	100 75 50 25 -80-3020 70	100 75 : <b>-0.13</b> 50 25 0 -80-3020 70	100 75 = <b>-0.13</b> 50 25 0 -80-3020 70	100 75 = <b>-0.39</b> 50 25 0 -80-3020 70	100 75 75 8 <b>R = 0</b> 25 0 -80-3020 70	100 75 50 25 0 -80-3020 70	alpha ● 0.3
	-				-	-	-80-3020 70 <b>JPPRF740</b> 6	-80-3020 70	-
	-	-80-3020 70	-80-3020 70	-80-3020 70	-80-3020 70	-80-3020 70	-80-3020 70 <b>JPPRF740</b> 6	-80-3020 70	-
	100 75 50 25 0	-80-3020 70 JPPRF5905	-80-3020 70 UPPRF642:	-80-3020 70 JPPRF6697	-80-3020 70 <b>JPPRF688</b> 2	-80-3020 70	-80-3020 70 <b>JPPRF740</b> 6	-80-3020 70 UPPRF8069	-
	100 75 50 25 0	-80-3020 70 UPPRF5905 = -0.15	-80-3020 70  UPPRF642:  100 75 50 25 0	-80-3020 70  JPPRF669;  1000 75 = 0.03 50 25 0	-80-3020 70  UPPRF688;  100 75 R = 0.1 50 25	-80-3020 70  UPPRF7224  100 75 25 0 -0.14	-80-3020 70  UPPRF7406  100 75 50 25 0	-80-3020 70  UPPRF806:  100 75 25 0 -0.04	-
	100 75 50 25 0	-80-3020 70  UPPRF5908 = -0.15  -80-3020 70	-80-3020 70  UPPRF642:  100 75 =-0.51 50 25 0 -80-3020 70	-80-3020 70  JPPRF669; 100 75 25 0 -80-3020 70	-80-3020 70  JPPRF688;  100 75 R = 0.1 50 -80-3020 70	-80-3020 70  UPPRF7224  100 75 50 25 0 -80-3020 70	-80-3020 70  JPPRF7406  100 75 50 25 0 -80-3020 70	-80-3020 70  UPPRF806:  100 75 25 0 -0.04	-

### Relationship between Mood and SubjPE

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

	100 75 50 25 0	JPPRF0140 = <b>0.65</b>	100 75 50 25 0	UPPRF0246 = 0.41	400	PPRF051: = 0.18	100 75 50 25 0	JPPRF0558 = 0.11	100 75 50 25 0	UPPRF057( <b>= 0.05</b>	100 75 50 25 0	JPPRF0640 = 0.18	100 75 50 25 0	UPPRF0816 = 0.04		
		-80-3020 70		-80-3020 70		0-3020 70		-80-3020 70		80-3020 70		-80-3020 70		-80-3020 70		
	100 75	JPPRF0839 = 0.13		UPPRF0850 = -0.02		PPRF1111 -0.04	100 75	JPPRF1116 = <b>0.14</b>		UPPRF1311 = <b>0.14</b>	100 75	JPPRF1471 R = <b>0.5</b>	100 75	UPPRF1483 = <b>0.58</b>		
	100 75 50 25 0	-80-3020 70	100 75 50 25 0	-80-3020 70	100 75 50 25 0	0-3020 70	100 75 50 25 0	-80-3020 70	100 75 50 25 0	80-3020 70	100 75 50 25 0	-80-3020 70	100 75 50 25 0	-80-3020 70		
	100	JPPRF1818		JPPRF2702		PPRF272	100	JPPRF2858		UPPRF3327	100	JPPRF343(	100	UPPRF372	Soc	ial_Anxiety
	100 75 50 25 0	-0.32	100 75 50 25 0	<del>= =0</del> .08	100 75 50 25 0	= 0.14	100 75 50 25 0	=_0.1	100 75 50 25 0	= <b>-0.1</b> 3	100 75 50 25 0	=_0.07	100 75 50 25 0	= 0.16	•	high
Mood		-80-3020 70 JPPRF4267		-80-3020 70		0-3020 70	-	-80-3020 70 <b>JPPRF513</b>		80-3020 70 UPPRF5499		-80-3020 70 UPPRF5499	-	-80-3020 70 UPPRF5529	•	low
2	100			JPPKF4312		PPRF4000	400	JPPKF313		JPPRF549		JPPRF349		JPPRF332		
	75 50 25	= 0.56	100 75 50 25	= 0.41	<sup>100</sup> <sub>75</sub> R	2 = 0.7	100 75 50 25	= -0.04	100 75 50 25	= 0.81	100 75 50 25	= −0.11	100 75 50 25	= 0.26	alph	na
	100 75 50 25 0	= <b>0.56</b> -80-3020 70	100 75 50 25 0	-80-3020 70	50 25 0	0-3020 70	100 75 50 25 0	= <b>-0.04</b> -80-3020 70	100 75 50 25 0	<b>80-3020 70</b>	100 75 50 25 0	= <b>-0.11</b> -80-3020 70	100 75 50 25 0	= <b>0.26</b> -80-3020 70	alph •	na 0.3
	100 75 50 25 0	-80-3020 70 UPPRF5905 = 0.37	100 75 50 25 0	-80-3020 70 UPPRF642: R = 0.5	-80 JI 100 75 50 25 0	0-3020 70 PPRF669: = 0.05	100 75 50 25 0	-80-3020 70 UPPRF6882 = 0.53	100 75 50 25 0	80-3020 70 UPPRF7224 =0.37	100 75 50 25 0	-80-3020 70 UPPRF7406 = -0.02	100 75 50 25 0	-80-3020 70  UPPRF8069  = 0.22	alph •	
	100 75 50 25 0	-80-3020 70 UPPRF5905	100 75 50 25 0	-80-3020 70 UPPRF642:	-80 JI 100 75 50 25 0	0-3020 70 PPRF6697	100 75 50 25 0	-80-3020 70  UPPRF6882  = 0.53  -80-3020 70  UPPRF9048	100 75 50 25 0	80-3020 70 UPPRF7224	100 75 50 25 0	-80-3020 70  UPPRF7406  = -0.02  -80-3020 70  UPPRF9058	100 75 50 25 0	-80-3020 70 UPPRF8069	alph •	
	100 75 50 25 0	-80-3020 70  UPPRF5908  = 0.37  -80-3020 70	100 75 50 25 0 100 75 50 25 0	.80-3020 70 UPPRF642: R = 0.5 .80-3020 70	-80 JII 100 75 50 -80 -80 100 75 50 25 0	0-3020 70 PPRF669; = 0.05 0-3020 70	100 75 500 25 0 100 750 25 0	-80-3020 70  UPPRF6882  = 0.53  -80-3020 70  UPPRF9048	100 75 552 0 100 75 525 0	80-3020 70  UPPRF7224  = -0.37  80-3020 70	100 75 505 25 0 100 750 25 0	-80-3020 70  UPPRF7406  = -0.02  -80-3020 70  UPPRF9058	100 75 50 25 0	-80-3020 70  UPPRF8069  = 0.22	alph •	

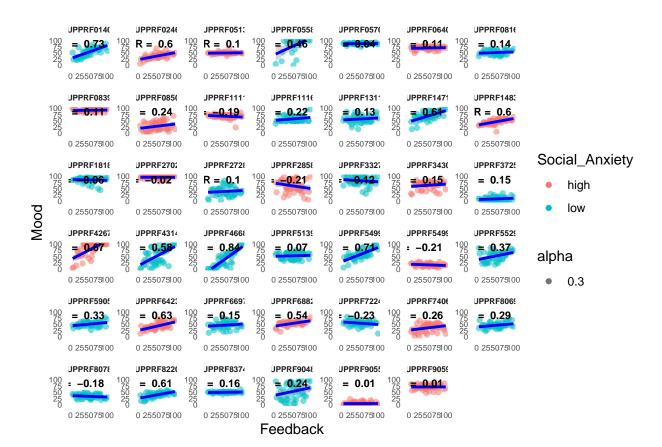
SubjPE: feedback - prediction

#### 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"

	100 75 50 25 0	UPPRF014( = 0.32	UPPRF0246 = 0.23 100 75 50 25 0 255075100	JPPRF051:  =0.11	UPPRF0558  = 0.21	UPPRF057( R = 0 100 75 50 25 0 255075100	UPPRF064( =0.14	UPPRF0816 = 0.32 0 255075100	
	100 75 50 25 0	UPPRF0835 = ■0.07 100 75 25 25 0 255075100	UPPRF085( = 0.33	JPPRF111'  - 0.22	UPPRF1116  -0.16 -75 -75 -75 -75 -75 -75 -75 -75 -75 -75	UPPRF1311  0.04 100 75 50 25 0 0 255075100	UPPRF1471 <b>= -0.1</b> 100 75 50 25 0 255075100	UPPRF148: = 0.07 0 255075100	
Mood	100 75 50 25 0	UPPRF1818  = 0.74 100 75 50 25 0 0 255075100	UPPRF270; = 0.34 100 75 50 25 0 255075100	JPPRF2728  -0.13	UPPRF2858  -0.14 100 75 50 25 0 0 255075100	UPPRF3321 - 0.03 100 75 50 0 25 0	UPPRF343(  R = 0.1 100 75 50 25 0 0 255075100	UPPRF372! = -0.07 0 255075100	<ul><li>Social_Anxiety</li><li>high</li><li>low</li></ul>
M	100 75 50 25 0	UPPRF4267 = 0.36 175 50 25 0 255075100	UPPRF4314 = 0.24	JPPRF4668 = <b>0.34</b> 100 75 50 25 0 255075100	UPPRF513\$  = 0.12	UPPRF549!	UPPRF549€  z −0.23	UPPRF5529 = 0.15 0 255075100	alpha  • 0.3
	100 75 50 25 0	UPPRF590£  R = 0	UPPRF642:  -0.05   100   75   50   25   0   255075100	JPPRF669:  = 0.11	UPPRF6882 = 0.04 100 75 50 50 0 255075100	UPPRF7224 = 0.43	UPPRF7406  = 0.43	UPPRF8069 = 0.11 0 255075100	
	100 75 50 25 0	UPPRF807€ = 0.05 100 75 50 0 255075100	UPPRF822( = 0.37   100   75   500   255075100	JPPRF8374 = 0.17 100 75 50 50 20 0 255075100	100 2-0.07 175 50 0 255075100 rediction	UPPRF905! = 0.33	UPPRF9059 = -0.1 0 255075100		

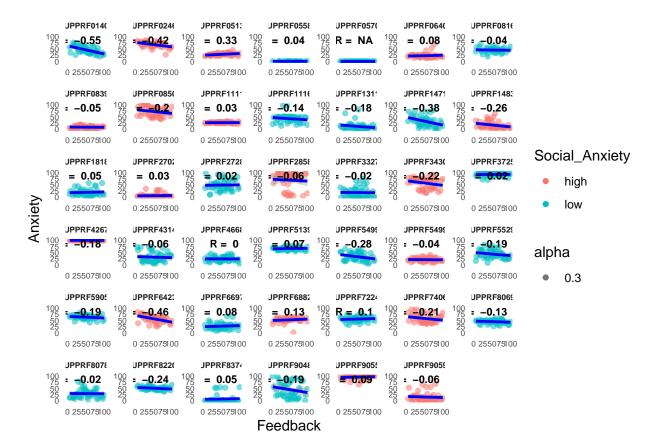
### Relationship between Anxiety and prediction

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

	100 75 50 25 0	UPPRF014( = 70.31	0 255075100	0 255075100	UPPRF0558  R = 0.1 100 75 50 25 0 255075100	UPPRF057(  R = NA	<b>JPPRF064</b> ( <b>= −0.19</b> 100 75 50 25 0 255075100	0 255075100	
	100 75 50 25 0	UPPRF0839 = -0.09 75 50 25 0 255075100	UPPRF0850  -0.34	JPPRF1111 = 0.07   100 75 50 25 0 255075100	<b>■ 0.01</b> 100 <b>■ 0.01</b> 75 50 25 0 255075100	UPPRF1311 = -0.24	UPPRF1471  = 0.05   100   75   500   25   0   0   0   0   0   0   0   0   0	UPPRF148: = 0.01 0 255075100	
Mood	100 75 50 25 0	UPPRF1818 = -0.46 75 50 25 60 255075100	UPPRF270: = -0.37	JPPRF2728 = 0.34	UPPRF2858  = 0.01	UPPRF3327 = -0.02	UPPRF343( =0.17	UPPRF372! = 0.13 0 255075100	Social_Anxiety     high     low
Mo	100 75 50 25 0	UPPRF4267  R = 0 100 75 50 25 0 255075100	UPPRF4314 0 = -0.13 100 75 50 0 255075100	JPPRF4668 R = 0.1 100 50 50 50 0 255075100	UPPRF5138  = 0.23	UPPRF5499 R = 0 100 75 50 25 0 255075100	UPPRF549\$  = −0.1 100 75 50 25 0 0 255075100	UPPRF5529 - 0.24 0 255075100	alpha  0.3
	100 75 50 25 0	UPPRF5905 = -0.06	UPPRF642: 0 = 0.28 100 75 50 50 0 255075100	JPPRF669; = 0.06 100 55 50 0 255075100	UPPRF688; = 0.11 100 75 50 25 0 255075100	UPPRF7224 = 0.67	UPPRF740€  ■	UPPRF8069 =0.18 0 255075100	
	100 75 50 25 0	UPPRF8078  - 0.38	UPPRF822( = -0.22 100 5 50 50 0 255075100	0 255075100	UPPRF9048 = 0.01 100 75 50 25 0 255075100 Prediction	UPPRF905!0.4 100 75 50 25 0 255075100	UPPRF9059  R = 0  0 255075100		

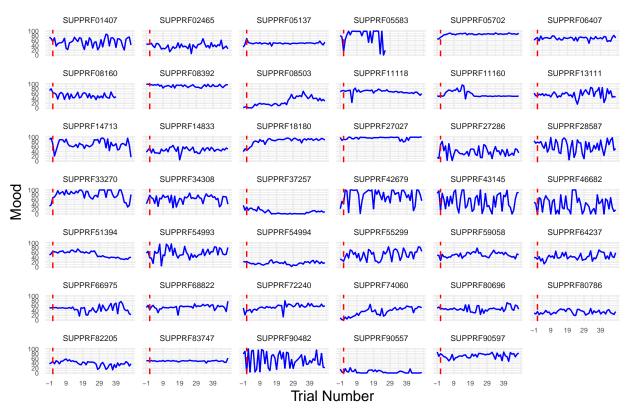
### Relationship between Anxiety and feedback

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



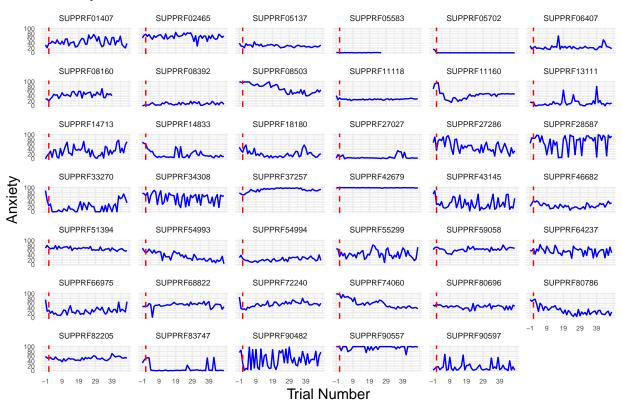
#### Mood over time

#### 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

##	#	A tibble: 4 x 3		
##		Thought_avatars_real	${\tt mean\_correlation}$	sample_size
##		<chr></chr>	<dbl></dbl>	<int></int>
##	1	no	0.0169	9
##	2	unclear	-0.109	8
##	3	yes	-0.0731	20
##	4	<na></na>	-0.0436	4

### Anxiety- Feedback correlations

##	#	A tibble: 4 x 3		
##		Thought_avatars_real	${\tt mean\_correlation}$	sample_size
##		<chr></chr>	<dbl></dbl>	<int></int>
##	1	no	0.0350	9
##	2	unclear	-0.145	8
##	3	yes	-0.151	20
##	4	<na></na>	0.0135	4

## Mood - SubjPE correlations

##	#	A tibble: 4 x 3		
##		Thought_avatars_real	${\tt mean\_correlation}$	sample_size
##		<chr></chr>	<dbl></dbl>	<int></int>
##	1	no	0.202	9
##	2	unclear	0.106	8
##	3	yes	0.204	20
##	4	<na></na>	0.0527	4

### Mood-Feedback correlations

##	#	A tibble: 4 x 3		
##		Thought_avatars_real	${\tt mean\_correlation}$	sample_size
##		<chr></chr>	<dbl></dbl>	<int></int>
##	1	no	0.251	9
##	2	unclear	0.140	8
##	3	yes	0.284	20
##	4	<na></na>	0.170	4

#### 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
                              407.58689 20.1888
##
   Random_ID (Intercept)
##
              Response_SubjPE
                                0.06984 0.2643
                                                  -0.06
   Residual
                              213.60713 14.6153
## Number of obs: 1939, groups: Random_ID, 41
## Fixed effects:
```

```
##
                   Estimate Std. Error t value
                  53.14198
                               3.17507 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)
                              417.22692 20.426
##
              Response_SubjPE 0.06915 0.263
                                                 -0.06
## Residual
                              213.61567 14.616
## Number of obs: 1939, groups: Random_ID, 41
## Fixed effects:
##
                                   Estimate Std. Error t value
## (Intercept)
                                   52.45925
                                               7.07618
                                                         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
                                       13.50
## (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
## -5.5574 -0.4904 0.0469 0.5255 3.9284
##
## Random effects:
                            Variance Std.Dev. Corr
  Groups
             Name
##
   Random_ID (Intercept)
                            608.45065 24.6668
                             0.06729 0.2594
##
              Response_fdbk
## Residual
                            194.21865 13.9362
## Number of obs: 1939, groups: Random_ID, 41
## Fixed effects:
                 Estimate Std. Error t value
## (Intercept)
                44.30178
                             3.92825
                                       11.28
## Response_fdbk 0.18269
                             0.04269
                                        4.28
##
## Correlation of Fixed Effects:
##
               (Intr)
## Respns_fdbk -0.577
## optimizer (bobyqa) convergence code: 0 (OK)
## Model failed to converge with max|grad| = 0.0068302 (tol = 0.002, component 1)
## 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:
      Min
                1Q Median
                                3Q
                                       Max
## -5.5575 -0.4866 0.0457 0.5265 3.9442
## Random effects:
```

```
Variance Std.Dev. Corr
## Groups
             Name
                           614.299 24.7851
## Random_ID (Intercept)
             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
                                            8.69600
                                                    4.373
## Response_fdbk
                                 0.29286
                                            0.09328
                                                      3.139
## mini_SPIN_total
                                 1.13193
                                            1.39884
                                                    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
```

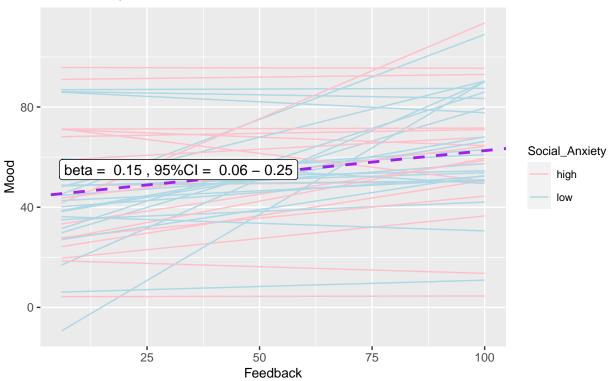
## [1] 16020.84

### 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

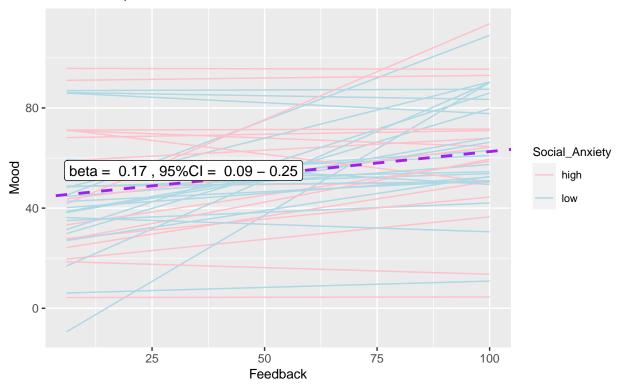


# Individual plots with LME for Mood with feedback instead of SubjPE $\,$

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)
                              6.357e+02 25.21399
##
              Response_SubjPE 3.349e-03 0.05787 -0.14
  Residual
                              2.097e+02 14.47931
## Number of obs: 1939, groups: Random_ID, 41
## Fixed effects:
##
                   Estimate Std. Error t value
## (Intercept)
                   40.59479
                               3.95299 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 -0.0228 0.3936 4.7108
##
## Random effects:
## Groups
             Name
                             Variance Std.Dev. Corr
  Random ID (Intercept)
                             6.065e+02 24.62706
             Response_SubjPE 3.448e-03 0.05872 -0.21
##
                              2.097e+02 14.47988
## Number of obs: 1939, groups: Random_ID, 41
## Fixed effects:
##
                                    Estimate Std. Error t value
## (Intercept)
                                   28.030648
                                            8.508071
                                                          3.295
## Response_SubjPE
                                              0.036886
                                  -0.059782
                                                        -1.621
## mini_SPIN_total
                                    2.277306
                                              1.369166
                                                          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
## (Intercept)
                43.78428
                             4.00926 10.921
## 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 26.0906
##
              Response_fdbk 3.283e-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
                          4.15095 10.542
## Response_fdbk -0.06277
                            0.01651 -3.802
##
## Correlation of Fixed Effects:
               (Intr)
## Respns_fdbk -0.339
## optimizer (bobyqa) convergence code: 0 (OK)
## Model failed to converge with max|grad| = 0.00277287 (tol = 0.002, component 1)
## 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
```

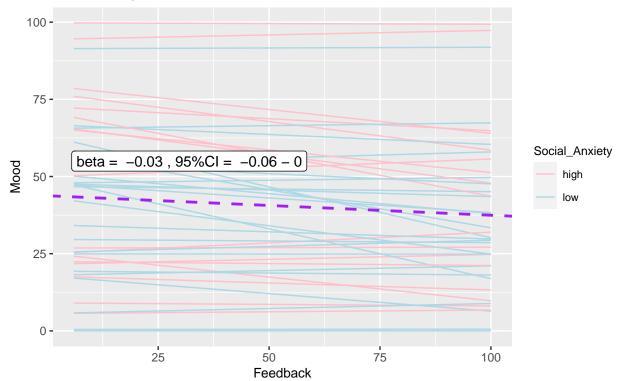
```
##
## Scaled residuals:
              1Q Median
      Min
## -4.4812 -0.4974 -0.0344 0.4075 4.7205
## Random effects:
## Groups
             Name
                           Variance Std.Dev. Corr
## Random_ID (Intercept)
                            650.91638 25.5131
##
              Response_fdbk
                            0.00354 0.0595 -0.35
                            208.36419 14.4348
## Number of obs: 1939, groups: Random_ID, 41
## Fixed effects:
##
                                 Estimate Std. Error t value
## (Intercept)
                                30.482218
                                            8.950990
                                                      3.405
## Response_fdbk
                                -0.052512
                                            0.036875 -1.424
## mini_SPIN_total
                                 2.397379
                                            1.440059
                                                      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

