

Supplementary Materials

Means and Standard Errors of the Mean in Experiment 1

Table 1

Experiment 1: Means and Standard Errors of the Mean for the Target Emotion of Fear When the Contextual Emotion Was Anger, Fear, or Neutral in a Social Inference and a Mere Context Condition

Emotional Scale	Contextual Emotion					
	Neutral		Fear		Anger	
	Mere Context	Social Inference	Mere Context	Social Inference	Mere Context	Social Inference
Anger	0.12 (.23)	0.16 (.24)	0.15 (.24)	0.16 (.23)	0.15 (.22)	0.16 (.25)
Sadness	1.74 (.44)	1.40 (.47)	1.45 (.43)	1.70 (.47)	1.55 (.44)	1.36 (.44)
Disgust	0.22 (.24)	0.21 (.24)	0.27 (.26)	0.24 (.26)	0.24 (.26)	0.29 (.25)
Fear	3.57 (.48)	3.70 (.48)	3.86 (.49)	3.97 (.55)	3.77 (.56)	5.01 (.48)
Surprise	3.47 (.47)	3.48 (.51)	3.33 (.52)	3.24 (.51)	3.48 (.50)	3.25 (.44)

Table 2

Experiment 1: Means and Standard Errors of the Mean for the Target Emotion of Anger When the Contextual Emotion Was Anger, Fear, or Neutral in a Social Inference and a Mere Context Condition

Emotional Scale	Contextual Emotion					
	Neutral		Fear		Anger	
	Mere Context	Social Inference	Mere Context	Social Inference	Mere Context	Social Inference
Anger	8.18 (.46)	8.13 (.45)	8.05 (.46)	8.20 (.45)	8.23 (.44)	8.42 (.20)
Sadness	0.11 (.16)	0.10 (.14)	0.06 (.13)	0.08 (.13)	0.08 (.15)	0.10 (.15)
Disgust	0.60 (.16)	0.62 (.14)	0.48 (.13)	0.56 (.13)	0.47 (.15)	0.63 (.15)
Fear	0.14 (.27)	0.12 (.25)	0.13 (.25)	0.16 (.26)	0.14 (.26)	0.13 (.26)
Surprise	0.15 (.26)	0.16 (.28)	0.15 (.26)	0.14 (.26)	0.12 (.23)	0.15 (.27)

Means and Standard Errors of the Mean in Experiment 2

Table 3

Experiment 2: Means and Standard Errors of the Mean of the Percentage of Responses in Which Facial Expression Blends of Fear and Surprise Were Categorized as Expressing Fear or Surprise When the Contextual Emotion Was Anger, Fear, or Neutral in a Social Inference and a Mere Context Condition

Response Category	Contextual Emotion					
	Neutral		Fear		Anger	
	Mere Context	Social Inference	Mere Context	Social Inference	Mere Context	Social Inference
Fear	48.8 (4.1)	46.6 (4.1)	49.9 (4.2)	50.9 (3.6)	48.1 (3.8)	54.9 (3.7)
Surprise	51.2 (4.1)	53.4 (4.1)	50.1 (4.2)	49.1 (3.6)	51.9 (3.8)	45.1 (3.7)

Table 4

Experiment 2: Means and Standard Errors of the Mean of the Percentage of Responses in Which Facial Expression Blends of Anger and Disgust Were Categorized as Expressing Anger or Disgust When the Contextual Emotion Was Anger, Fear, or Neutral in a Social Inference and a Mere Context Condition

Response Category	Contextual Emotion					
	Neutral		Fear		Anger	
	Mere Context	Social Inference	Mere Context	Social Inference	Mere Context	Social Inference
Anger	49.4 (3.9)	51.1 (3.5)	48 (4)	47.3 (3.7)	48.1 (3.8)	48.9 (3.5)
Disgust	50.6 (3.9)	48.9 (3.5)	52 (4)	52.7 (3.7)	51.9 (3.8)	48.9 (3.5)

Confusion matrix for the categorization of the contextual face in Experiment 1.

Table 5

Confusion matrix for the Categorization of the Contextual Emotion in Experiment 1.

Contextual Emotion	Responses						Total Trials
	fear	sadness	anger	surprise	disgust	none	
Anger	10	5	2	6	6	339	368
Fear	4	3	5	10	10	336	368

Table 6

Individual Data for the Categorization of Contextual Emotions of Anger and Fear in Experiment 1.

Participant	Contextual Emotion	Responses						Contextual Emotion	Responses					
		<i>F</i>	<i>Sad</i>	<i>A</i>	<i>Surp</i>	<i>D</i>	<i>N</i>		<i>F</i>	<i>Sad</i>	<i>A</i>	<i>Surp</i>	<i>D</i>	<i>N</i>
1	Anger	0	0	0	0	0	8	Fear	0	0	0	0	0	8
2	Anger	0	0	1	0	0	7	Fear	0	0	0	0	0	8
3	Anger	0	0	0	0	0	8	Fear	0	0	0	0	0	8
4	Anger	0	0	0	0	0	8	Fear	0	0	0	0	0	8
5	Anger	0	0	0	0	0	8	Fear	0	0	0	0	0	8
6	Anger	1	0	0	1	0	6	Fear	0	0	0	2	0	6
7	Anger	0	1	0	0	0	7	Fear	0	1	0	0	0	7
8	Anger	1	0	0	0	0	7	Fear	0	0	0	0	0	8
9	Anger	0	0	0	0	0	8	Fear	0	0	0	0	0	8
10	Anger	0	0	0	0	0	8	Fear	0	0	0	0	0	8
11	Anger	0	0	0	0	0	8	Fear	0	0	0	0	0	8
12	Anger	0	0	0	0	0	8	Fear	0	0	0	0	0	8
13	Anger	0	0	0	0	0	8	Fear	0	0	0	0	0	8
14	Anger	0	0	0	0	0	8	Fear	0	0	0	0	0	8
15	Anger	0	0	0	0	0	8	Fear	0	0	0	0	0	8
16	Anger	0	0	0	0	0	8	Fear	0	0	0	0	0	8
17	Anger	1	0	0	0	0	7	Fear	0	0	0	2	0	6
18	Anger	0	0	0	0	0	8	Fear	0	0	1	0	0	7

Participant	Contextual Emotion	Responses						Contextual Emotion	Responses					
		<i>F</i>	<i>Sad</i>	<i>A</i>	<i>Surp</i>	<i>D</i>	<i>N</i>		<i>F</i>	<i>Sad</i>	<i>A</i>	<i>Surp</i>	<i>D</i>	<i>N</i>
19	Anger	0	0	0	0	0	8	Fear	0	0	0	0	0	8
20	Anger	0	0	0	0	0	8	Fear	0	0	0	0	0	8
21	Anger	1	3	0	2	0	2	Fear	1	1	0	2	1	3
22	Anger	0	0	0	0	0	8	Fear	0	0	0	0	0	8
23	Anger	0	0	0	0	0	8	Fear	0	0	1	1	2	4
24	Anger	1	0	0	0	0	7	Fear	0	0	0	0	0	8
25	Anger	0	0	0	0	0	8	Fear	0	0	1	0	0	7
26	Anger	0	0	0	0	0	8	Fear	0	0	0	0	0	8
27	Anger	1	0	0	0	0	7	Fear	0	0	0	0	0	8
28	Anger	0	0	0	0	0	8	Fear	0	0	0	0	0	8
29	Anger	0	0	0	0	0	8	Fear	0	0	0	0	0	8
30	Anger	0	0	0	0	0	8	Fear	0	0	0	0	0	8
31	Anger	0	0	0	0	0	8	Fear	0	0	0	0	0	8
32	Anger	0	0	0	0	0	8	Fear	0	0	0	0	0	8
33	Anger	0	0	0	0	0	8	Fear	0	0	0	0	0	8
34	Anger	0	0	0	0	0	8	Fear	0	0	0	0	0	8
35	Anger	0	0	0	0	0	8	Fear	0	0	0	0	0	8
36	Anger	0	0	0	0	0	8	Fear	0	0	0	0	0	8
37	Anger	2	1	0	2	1	2	Fear	1	0	0	3	1	3
38	Anger	0	0	0	0	0	8	Fear	0	0	0	0	0	8
39	Anger	0	0	0	0	0	8	Fear	0	0	0	0	0	8
40	Anger	1	0	1	1	5	0	Fear	1	0	1	0	6	0
41	Anger	0	0	0	0	0	8	Fear	1	0	0	0	0	7
42	Anger	1	0	0	0	0	7	Fear	0	0	0	0	0	8
43	Anger	0	0	0	0	0	8	Fear	0	0	1	0	0	7
44	Anger	0	0	0	0	0	8	Fear	0	0	0	0	0	8
45	Anger	0	0	0	0	0	8	Fear	0	0	0	0	0	8
46	Anger	0	0	0	0	0	8	Fear	0	1	0	0	0	7

Note. Forty-three (in bold) of 46 participants responded “none,” which was significantly above chance, when the contextual emotion was anger or fear (one-tailed binomial test for response “none,” chance level = 0.17, $p < .01$, for 43 participants). F = fear; Sad = sadness; A = anger; Surp = surprise; D = disgust; N = none.

Confusion matrix for the categorization of the contextual face in Experiment 2.

Table 7

Confusion matrix for the Categorization of the Contextual Emotion in Experiment 2.

Contextual Emotion	Responses							Total Trials
	fear	sadness	anger	surprise	disgust	happiness	none	
Anger	4	8	5	8	5	1	545	576
Fear	5	5	5	3	6	2	550	576

Table 8

Individual Data for the Categorisation of Contextual Emotions of Anger and Fear in Experiment 2.

Participant	Contextual Emotion	Responses							Contextual Emotion	Responses						
		<i>F</i>	<i>Sad</i>	<i>A</i>	<i>Surp</i>	<i>D</i>	<i>H</i>	<i>N</i>		<i>F</i>	<i>Sad</i>	<i>A</i>	<i>Surp</i>	<i>D</i>	<i>H</i>	<i>N</i>
1	Anger	0	0	0	0	0	0	12	Fear	0	0	0	0	0	0	12
2	Anger	0	0	1	0	0	0	11	Fear	0	0	0	0	0	0	12
3	Anger	0	0	0	0	1	0	11	Fear	0	0	0	0	0	0	12
4	Anger	0	0	0	0	0	0	12	Fear	0	0	0	0	0	0	12
5	Anger	0	0	0	0	0	0	12	Fear	0	1	0	0	0	0	11
6	Anger	0	0	0	0	0	0	12	Fear	0	0	0	0	1	0	11
7	Anger	0	2	0	0	1	0	9	Fear	1	0	0	0	1	0	10
8	Anger	1	0	1	0	0	0	10	Fear	0	0	2	1	0	0	9
9	Anger	0	1	0	1	0	0	10	Fear	1	2	0	0	0	0	9
10	Anger	0	0	0	0	0	0	12	Fear	0	0	0	0	0	0	12
11	Anger	0	0	0	0	0	0	12	Fear	0	0	0	0	0	0	12
12	Anger	0	0	0	0	0	0	12	Fear	0	0	0	0	0	0	12
13	Anger	0	0	0	0	0	0	12	Fear	0	0	0	0	0	0	12
14	Anger	0	0	0	0	0	0	12	Fear	0	0	0	0	0	0	12
15	Anger	0	0	0	0	0	0	12	Fear	0	0	0	0	0	0	12
16	Anger	0	0	0	0	0	0	12	Fear	0	0	0	0	0	0	12
17	Anger	0	0	0	1	1	0	10	Fear	0	0	0	0	0	0	12
18	Anger	0	0	0	0	0	0	12	Fear	0	0	0	0	0	0	12
19	Anger	0	3	0	0	0	0	9	Fear	0	1	0	0	0	0	11
20	Anger	1	0	0	0	0	0	11	Fear	0	0	0	0	0	0	12

Participant	Contextual Emotion	Responses							Contextual Emotion	Responses						
		<i>F</i>	<i>Sad</i>	<i>A</i>	<i>Surp</i>	<i>D</i>	<i>H</i>	<i>N</i>		<i>F</i>	<i>Sad</i>	<i>A</i>	<i>Surp</i>	<i>D</i>	<i>H</i>	<i>N</i>
21	Anger	1	0	2	1	1	0	7	Fear	0	0	0	1	0	0	11
22	Anger	0	0	0	0	0	0	12	Fear	0	0	0	0	0	0	12
23	Anger	0	0	0	0	0	0	12	Fear	0	0	0	0	0	0	12
24	Anger	0	0	0	1	1	0	10	Fear	0	0	1	0	1	0	10
25	Anger	0	0	0	0	0	0	12	Fear	0	0	0	0	0	0	12
26	Anger	0	0	0	0	0	0	12	Fear	0	0	0	0	0	0	12
27	Anger	0	0	1	0	0	0	11	Fear	2	0	0	0	1	0	9
28	Anger	0	0	0	0	0	0	12	Fear	0	0	0	0	0	0	12
29	Anger	0	0	0	0	0	0	12	Fear	0	0	0	0	0	0	12
30	Anger	0	0	0	2	0	0	10	Fear	0	0	0	1	0	0	11
31	Anger	0	0	0	0	0	0	12	Fear	0	0	1	0	0	0	11
32	Anger	0	0	0	1	0	0	11	Fear	0	0	0	0	0	0	12
33	Anger	0	0	0	0	0	0	12	Fear	0	0	0	0	0	0	12
34	Anger	0	1	0	0	0	0	11	Fear	0	0	0	0	2	0	10
35	Anger	1	0	0	0	0	0	11	Fear	0	0	0	0	0	0	12
36	Anger	0	1	0	0	0	1	10	Fear	1	0	0	0	0	2	9
37	Anger	0	0	0	0	0	0	12	Fear	0	0	0	0	0	0	12
38	Anger	0	0	0	0	0	0	12	Fear	0	0	0	0	0	0	12
39	Anger	0	0	0	1	0	0	11	Fear	0	0	0	0	0	0	12
40	Anger	0	0	0	0	0	0	12	Fear	0	0	0	0	0	0	12
41	Anger	0	0	0	0	0	0	12	Fear	0	0	0	0	0	0	12
42	Anger	0	0	0	0	0	0	12	Fear	0	0	0	0	0	0	12
43	Anger	0	0	0	0	0	0	12	Fear	0	1	0	0	0	0	11
44	Anger	0	0	0	0	0	0	12	Fear	0	0	0	0	0	0	12
45	Anger	0	0	0	0	0	0	12	Fear	0	0	1	0	0	0	11
46	Anger	0	0	0	0	0	0	12	Fear	0	0	0	0	0	0	12
47	Anger	0	0	0	0	0	0	12	Fear	0	0	0	0	0	0	12
48	Anger	0	0	0	0	0	0	12	Fear	0	0	0	0	0	0	12

Note. All the participants responded “none,” a result significantly above chance, when the contextual emotion was anger or fear (one-tailed binomial test for response “none,” chance level = 0.14, $p < .01$, for all participants). F = fear; Sad = sadness; A = anger; Surp = surprise; D = disgust; H = happiness; N = none.

Stimulus Generation Procedure for Experiment 2

We were able to map photorealistic skin texture onto FACSGen faces by using FaceGen Modeller (2007). These photofits gave a human-like appearance to the faces (see Krumhuber, Tamarit, Roesch, & Scherer, 2012). Four photofits were generated on the basis of four human faces selected from the Radboud Faces Database (Langner et al., 2010).

In order to create facial expression blends of fear and surprise, we generated 10 facial expressions that depict a combination of action units presented in each prototypical expression of fear and surprise (see Figure 1): **blend F-S_1**: 80% of 1+2+4, 5, and 26 and 20% of 27; **blend F-S_2**: 80% of 1, 2, 5, 25, and 26 and 30% of 20; **blend F-S_3**: 80% of 1+2+4 and 5 and 50% of 27; **blend F-S_4**: 80% of 1, 2, and 5 and 30% of 20 and 26; **blend F-S_5**: 80% of 1, 2, 5, and 26 and 30% of 20; **blend F-S_6**: 80% of 1+2+4 and 5 and 50% of 20 and 27; **blend F-S_7**: 80% of 1+2+4, 5, and 26, 50% of 20, and 40% of 27; **blend F-S_8**: 100% of 1, 80% of 2, 5, and 26, 40% of 1+2+4, and 30% of 20; **blend F-S_9**: 50% of 1, 80% of 2, 5, and 26 and 30% of 20; **blend F-S_10**: 80% of 1, 5, and 26, 50% of 2, and 30% of 20. Each combination of action units was expressed by the four photofit FACSGen faces.

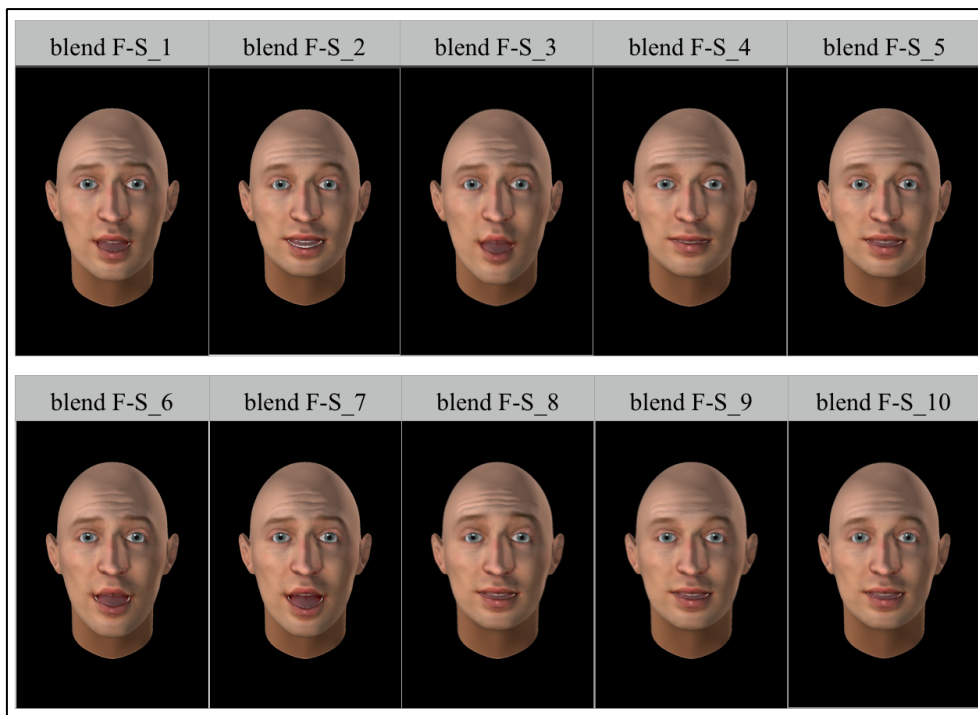


Figure 1: Facial Expression Blends of Fear and Surprise.

The same procedure was followed to create facial expression blends of anger and disgust.

The four photofit FACSGen faces expressed the following combinations of action units (see Figure 2): **blend A-D_1**: 80% of 4, 5, and 7 and 100% of 10; **blend A-D_2**: 50% of 9 and 80% of 23 and 24; **blend A-D_3**: 50% of 9, 30% of 10, and 80% of 23 and 24; **blend A-D_4**: 80% of 4, 5, 7, and 10 and 30% of 17; **blend A-D_5**: 80% of 4, 5, 7, and 24 and 30% of 17; **blend A-D_6**: 80% of 4, 5, 7, 10, and 23; **blend A-D_7**: 80% of 24, 50% of 9, and 30% of 10; **blend A-D_8**: 50% of 9, 10, 23, and 24 and 30% of 17; **blend A-D_9**: 80% of 4, 5, 7, and 10 and 50% of 23 and 24; **blend A-D_10**: 80% of 5 and 7, 50% of 4, 9, 10, 23, and 24, and 60% of 17.

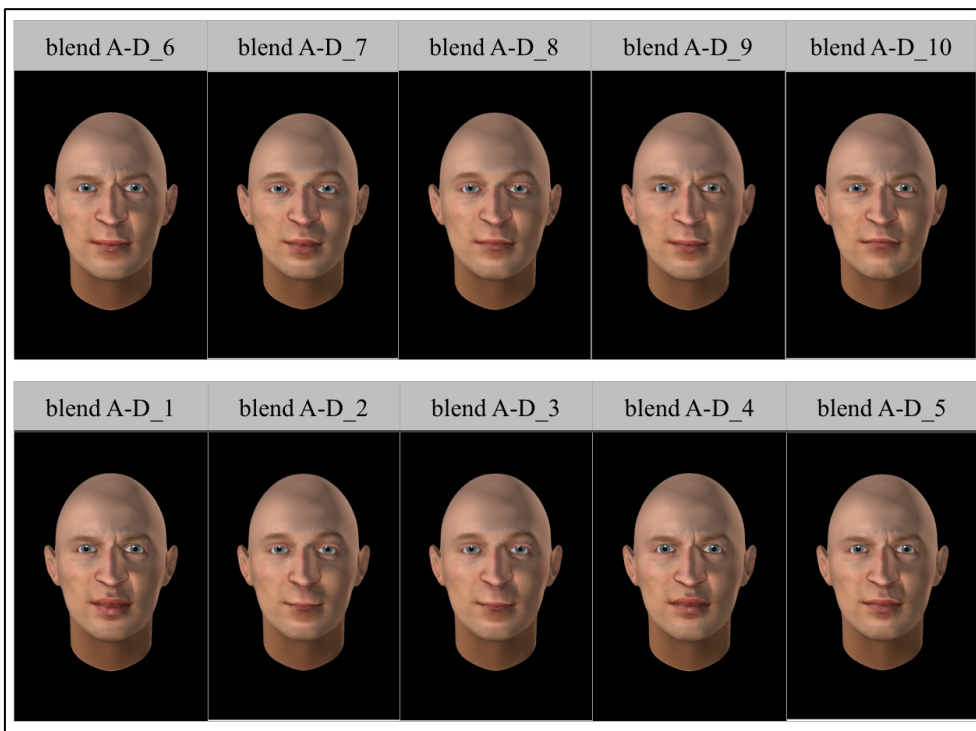


Figure 2: Facial Expression Blends of Anger and Disgust.

Dynamic emotional expressions were created by superimposing 30 static images (frames) corresponding to the unfolding of the expression from a neutral state to a peak expression. The duration of each sequence was approximately 510 ms.

Stimulus Validation Procedure for Experiment 2

We conducted an experiment to create different ambiguous emotional expressions. We investigated, among other stimuli, which combination of action units was less discriminated

between two emotion categories: Fear and Surprise for the expression blends of fear and surprise; Anger and Disgust for the expression blends of anger and disgust.

Twenty-seven undergraduate students (23 females, 4 males; mean age: 22.67 ± 4.85 years) from the University of Geneva participated in the study to fulfill a course requirement. After the presentation of the stimuli, participants were presented with five visual analogue scales. The emotion labels used for these scales were the French terms for anger, fear, surprise, disgust, sadness, and happiness. Participants had to use these scales to indicate the extent to which the five different emotion types were perceived in the facial expression (range between 0 on the left pole and 10 on the right pole). Participants rated, in addition to other stimuli, the 20 combinations of action units expressed by four photofit faces.

We computed a fear recognition index to characterize the response of each participant to the facial expression blends of fear and surprise. This index was defined as the difference between the scores on the visual analogue scales of fear and surprise. Therefore, scores around zero indicate that participants perceived as much as fear as surprise in the combination of action units presented, whereas positive scores indicate that participants perceived more fear than surprise. The inverse is true for negative scores. The three combinations of action units that were less discriminated between Fear and Surprise were selected for our study (black dots in Figure 3).

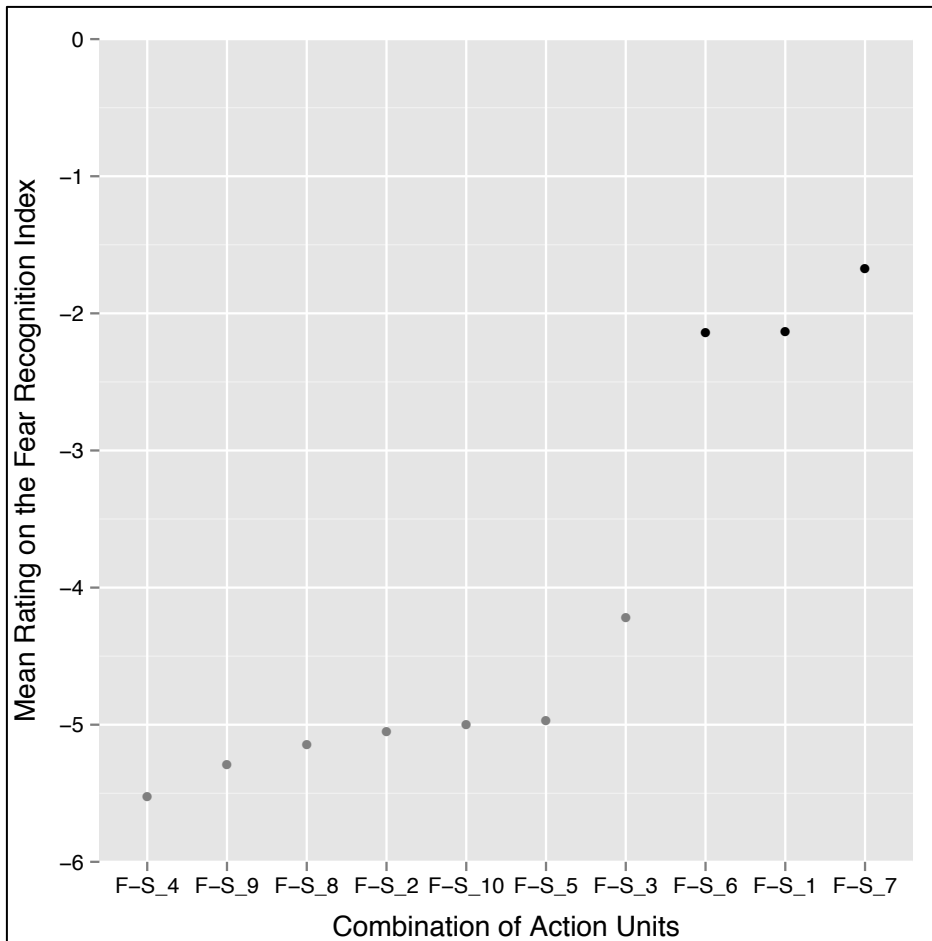


Figure 3: Mean rating on the Fear Recognition Index for 10 Expression Blends of Fear and Surprise.

We also computed an anger recognition index to characterize the response of each participant for the facial expression blends of anger and disgust. This index was defined as the difference between the scores on the visual analogue scales of anger and disgust. The three combinations of action units that were less discriminated between Anger and Disgust were selected for our study (blacks dots in Figure 4).

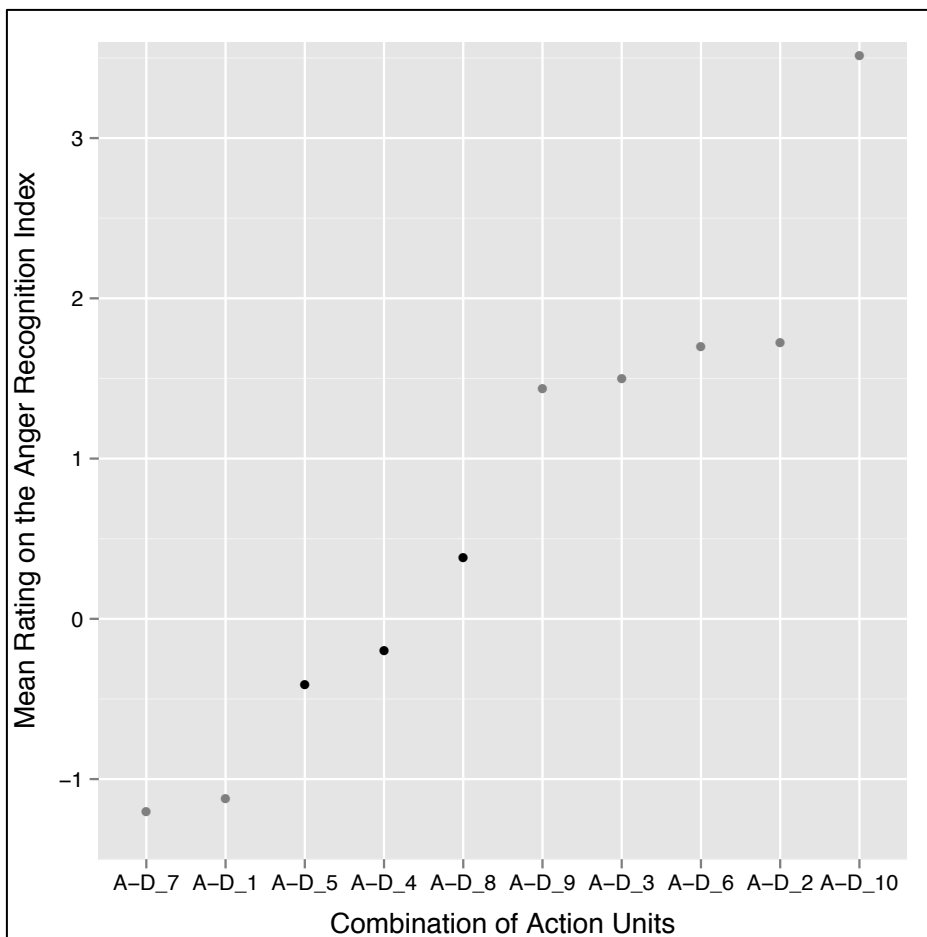


Figure 4: Mean rating on the Anger Recognition Index for 10 Expression Blends of Anger and Disgust.

References

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