Supplementary results

https://github.com/iBMLab/Static_dynamic

Supplementary Figures

5–6 age group

	Anger	Disgust	Fear	Happy	Sad	Surprise	Null		Anger	Disgust	Fear	Happy	Sad	Surprise	Null		Anger	Disgust	Fear	Happy	Sad	Surprise	Null
Anger		0.12	0.018	0.014	0.12	0.021	0.087	Anger		0.11	0.021	0.014	0.15	0.053	0.13	Anger	0.5	0.079	0.039	0.012		0.053	
bisgust			0.0061			0.042		bisgust			0.023	0.021	0.12		0.11	bisgust	0.31		0.032			0.069	
Fear	0.023	0.071	0.15	0.039	0.065		0.12	Fear	0.03	0.056	0.13	0.06	0.088		0.19	Fear	0.056	0.051	0.17		0.12		
Happy		0.0023	o	0.96	0.0018	0.021	0.0046	Happy		0.0023	o	0.93	0	0.021	0.037	Happy	0.016	0.0046	o	0.9	0.0046	0.019	0.056
Sad		0.074	0.058	0.0046		0.071	0.096	Sad		0.042	0.044	0.0069		0.1	0.13	Sad	0.14	0.042	0.076	0.0069		0.065	
urprise	0.0084	0.026	0.03	0.26	0.0023	0.6	0.068	urprise	0.012	0.046	0.039	0.25	0.0093	0.55	0.088	urprise	0.023	0.039	0.046	0.31	0.016	0.41	
ŝ				Dynamic				ŝ				Static				3				Shuffled			

7–8 age group

	Anger	Disgust	Fear	Нарру	Sad	Surprise	Null		Anger	Disgust	Fear	Нарру	Sad	Surprise	Null		Anger	Disgust	Fear	Нарру	Sad	Surprise	Null
Anger	0.68	0.12		o		0.031		Anger		0.097	0.026	0.0057	0.16	0.034	0.062	Anger		0.069		0.0031		0.019	0.05
bisgust				0.0057		0.037		bisgust			0.026	0.0028	0.13	0.029	0.026	bisgust				0.0063		0.019	0.05
Fear	0.046	0.047		0.015	0.11		0.051	Fear	0.057	0.065		0.02	0.12		0.085	Fear	0.056	0.13		0.022			0.047
Happy	0.0081	0.0028	o	0.98	0.0028	0.0057	0.0048	Happy	0.017	o	0.0057	0.94	0.0085	0.023	0.0085	Happy	0.0094	0.013	0.013	0.91	0.017	0.0063	0.035
Sad		0.072		0.0023		0.054	0.067	Sad		0.051	0.045	0.02		0.064	0.085	Sad		0.05	0.087	0.0094		0.025	0.066
rprise		0.0079		0.22	0.0028	0.63	0.018	Irprise	0.026	0.031		0.2	0.0057	0.56	0.051	rrprise		0.037		0.2	0.022	0.48	0.072
ß				Dynamic				ŝ				Static				3				Shuffled			

9–10 age group



Figure 12A. Confusion matrices – Response classification errors. Each row displays one of the six presented facial expressions, while each column shows the average frequency of the

response given by the observers (Null indicates a "I don't know" response). For example, in the 5–6 age group, when presented with fear, the confusion rates observed for surprise reached up to 53% in the dynamic condition, 44% in the static, and 37% in the shuffled condition.

11-12 age group



13-14 age group

	Anger	Disgust	Fear	Happy	Sad	Surprise	Null		Anger	Disgust	Fear	Happy	Sad	Surprise	Null		Anger	Disgust	Fear	Happy	Sad	Surprise	Null
Anger		0.19		0.0054	0.1	0.024	0.084	Anger		0.23	0.049	0.0082	0.15	0.027	0.1	Anger		0.11	0.057	0.0027		0.016	
bisgust			0.043	0.014		0.03	0.041	bisgust		0.57	0.033	0.0054	0.15		0.046	bisgust			0.06	0.0082		0.043	
Fear		0.082		0.024	0.052		0.071	Fear		0.15		0.014	0.035		0.1	Fear	0.035	0.084		0.049	0.095		
Happy		0		0.97	0	0.022	0.0082	Happy	0.0082		0.0054	0.91	0.0082	0.022	0.022	Happy	0.0054	0.024	0.0054	0.89	0.016	0.0054	
Sad				0.016		0.043		Sad			0.1	0.024		0.022	0.13	Sad		0.095		0.011		0.016	
urprise		0.019	0.065		0		0.052	urprise		0.038	0.12		0.0082		0.071	urprise		0.041	0.14		0.0027		
05				Dynamic				Ø				Static				0				Shuffled			

15-16 age group



Figure 12B. Confusion matrices – Response classification errors. Each row displays one of the six presented facial expressions, while each column shows the average frequency of the response given by the observers (Null indicates a "I don't know" response).

17-18 age group



19-20 age group

	Anger	Disgust	Fear	Happy	Sad	Surprise	Null		Anger	Disgust	Fear	Happy	Sad	Surprise	Null		Anger	Disgust	Fear	Happy	Sad	Surprise	Null
Anger	0.69	0.12		0	0.099	0.013	0.041	Anger		0.14	0.05	0	0.17	0.015	0.042	Anger		0.056	0.071	0.002		0.004	
Disgust				o			0.026	Disgust		0.75	0.017		0.13	0.01	0.017	Disgust			0.046	o		0.004	
Fear	0.0086	0.015		0.0022			0.054	Fear				0.0021	0.027		0.081	Fear				0.0081	0.048		
Happy	0.0022	0.0065	0.0043	0.97	0.0043	0.0065	0.011	Happy	0.0021	0.027	0.013	0.92	0.0042	0.01	0.023	Happy		0.028	0.012	0.91	0.012	0.0081	
Sad		0.082		0.0043		0.022	0.097	Sad		0.069	0.12	0.0021		0.023	0.098	Sad		0.071		0.002		0.006	
urprise	0.0065	0.0065			0	0.73	0.011	urprise		0.025	0.13		0.0021	0.69	0.037	urprise		0.006	0.17		0.002	0.62	0.065
ਰੱ Dynamic ਹੋ												Static				0				Shuffled			

21-30 age group



Figure 12C. Confusion matrices – Response classification errors. Each row displays one of the six presented facial expressions, while each column shows the average frequency of the response given by the observers (Null indicates a "I don't know" response).

31-40 age group



41-50 age group

	Anger	Disgust	Fear	Happy	Sad	Surprise	Null		Anger	Disgust	Fear	Happy	Sad	Surprise	Null		Anger	Disgust	Fear	Happy	Sad	Surprise	Null
Anger		0.093	0.068	0.0019		0.064	0.042	Anger		0.1	0.061		0.2	0.045	0.04	Anger		0.081	0.11	0.013		0.025	0.044
bisgust			0.045	0.0019			0.015	bisgust			0.061	0.0019	0.13	0.038	0.023	bisgust			0.095	0.0095		0.023	
Fear		0.028		0.027	0.038		0.034	Fear		0.042			0.059		0.049	Fear	0.085	0.032		0.032			
Happy	0.0057	0.0076	o	0.92	0.0038		0.03	Happy		0.0057	0.011	0.92	0.011	0.025	0.017	Happy	0.066	0.0095	0.021	0.77		0.055	
Sad		0.085	0.12	0.013			0.074	Sad		0.089	0.11	0.019			0.057	Sad		0.066		0.015		0.061	0.044
arprise	0.013	0.013	0.032		0.0038	0.71	0.019	urprise		0.011	0.062		0.0057		0.034	urprise		0.023	0.087		0.017		
б				Dynamic				Ø				Static				ത				Shuffled			

51-60 age group



Figure 12D. Confusion matrices - Response classification errors. Each row displays one of the six presented facial expressions, while each column shows the average frequency of the response given by the observers (Null indicates a "I don't know" response).

61–70 age group



71-80 age group

	Anger	Disgust	Fear	Happy	Sad	Surprise	Null		Anger	Disgust	Fear	Happy	Sad	Surprise	Null		Anger	Disgust	Fear	Happy	Sad	Surprise	Null
Anger		0.2	0.12	0.0063		0.11	0.04	Anger		0.14	0.13	0.017	0.15	0.075	0.083	Anger	0.38	0.15	0.13	0.015		0.093	
bisgust			0.079	0.015		0.035	0.04	bisgust			0.13	0.015	0.11	0.058	0.03	lisgust	0.3		0.11			0.065	
Fear		0.037		0.019	0.052		0.04	Fear	0.042	0.037		0.051	0.056		0.1	Fear	0.14	0.08	0.27	0.026	0.093		
Happy	0.0063	0.023	0.0042	0.86	0.0063	0.075	0.029	Happy		0.023	0.04	0.76	0.015	0.069	0.062	Happy	0.13	0.039	0.069		0.045		
Sad			0.11	0.017		0.19	0.1	Sad			0.12	0.021	0.3	0.16	0.1	Sad	0.12		0.18	0.026			
arprise		0.015	0.05		o		0.025	urprise		0.033	0.073		0.015		0.067	urprise	0.19	0.056	0.14		0.032		0.084
ത്				Dynamic				о́б				Static				ಹ				Shuffled			

81-90 age group



Figure 12E. Confusion matrices - Response classification errors. Each row displays one of the six presented facial expressions, while each column shows the average frequency of the response given by the observers (Null indicates a "I don't know" response).

Supplementary Table

			Condition effect
			(∆= Dynamic –
	Dynamic	Static	static)
PE	75.8%	70%	5.8%
> 80	62.8%	45%	17.8%
Age effect on the			
conditions			
(∆=PE - >80)	13%	25%	

 Table 1. Recognition performance for surprise between the dynamic and static conditions

 at peak efficiency and above the age of 80.

Note. PE = recognition performance at peak efficiency; > 80 = recognition performance for all the observers above the age of 80 (N = 41).

As shown in Table 1, we observed an overall advantage for the processing of the dynamic facial expression of surprise over the static one. This advantage was even more marked for the above 80-year-old observers (Δ Dynamic – static). Importantly, the recognition performance of the dynamic expression of surprise decreased from 75.8% at peak efficiency to 62.8% after the age of 80 ($\Delta = 13\%$). For the static expression of surprise, the recognition performance dropped from 70% at peak efficiency to 45% after the age of 80 ($\Delta = 25\%$). When the performance of the observers above the age of 80 is compared to the performance at the peak efficiency (Δ PE – >80), then the difference in the static condition is nearly twice as large that in the dynamic condition. This pattern of results favors the view that the dynamic advantage for the recognition of facial expressions of emotion is driven by a suboptimal performance for static stimuli.