# Supplementary results

https://github.com/iBMLab/Static\_dynamic

# **Supplementary Figures**

# 5–6 age group

	Anger	Disgust	Fear	Нарру	Sad	Surprise	Null		Anger	Disgust	Fear	Нарру	Sad	Surprise	Null		Anger	Disgust	Fear	Нарру	Sad	Surprise	Null
Anger		0.12	0.018	0.014	0.12	0.021	0.087	Anger		0.11	0.021	0.014	0.15	0.053	0.13	Anger		0.079	0.039	0.012		0.053	0.093
Disgust			0.0061	0		0.042	0.059	Disgust			0.023	0.021	0.12	0.06	0.11	Disgust			0.032	0.014		0.069	0.09
Fear	0.023	0.071		0.039	0.065		0.12	Fear		0.056	0.13	0.06	0.088		0.19	Fear	0.056	0.051		0.079			0.15
Happy		0.0023		0.96	0.0018	0.021	0.0046	Happy		0.0023	o	0.93	o	0.021	0.037	Happy		0.0046	o	0.9	0.0046		0.056
Sad				0.0046		0.071		Sad		0.042	0.044	0.0069		0.1	0.13	Sad		0.042		0.0069		0.065	0.12
urprise	0.0084	0.026	0.03		0.0023		0.068	urprise	0.012	0.046	0.039	0.25	0.0093		0.088	Surprise	0.023	0.039	0.046		0.016		0.16
<i>i</i> ,				Dynamic d Static d Stuffled									ಹ			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				0.031		Anger		0.097	0.026	0.0057	0.16		0.062	Anger		0.069		0.0031		0.019	0.05
Disgust				0.0057		0.037		bisgust			0.026	0.0028	0.13	0.029	0.026	Disgust				0.0063			0.05
Fear	0.046	0.047					0.051	Fear		0.065			0.12		0.085	Fear	0.056			0.022			0.047
Happy	0.0081	0.0028	0	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	0.65	0.054	0.067	Sad		0.051	0.045	0.02	0.58	0.064	0.085	Sad				0.0094	0.63	0.025	0.066
urprise	0.014	0.0079		0.22	0.0028	0.63	0.018	rprise	0.026	0.031	0.12	0.2	0.0057	0.56	0.051	urprise			0.14	0.2	0.022	0.48	0.072
ß			Dynamic d Static d 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	Нарру	Sad	Surprise	Null		Anger	Disgust	Fear	Happy	Sad	Surprise	Null		Anger	Disgust	Fear	Нарру	Sad	Surprise	Null
Anger		0.19	0.035	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	0.1
Disgust	0.12		0.043	0.014		0.03	0.041	Disgust			0.033	0.0054	0.15	0.052	0.046	Disgust	0.21		0.06	0.0082		0.043	0.076
Fear							0.071	Fear (					0.035		0.1	Fear	0.035	0.084		0.049			0.17
Happy	0	o	0	0.97	0	0.022	0.0082	Happy	0.0082	0.027	0.0054	0.91	0.0082	0.022	0.022	Happy	0.0054		0.0054	0.89	0.016	0.0054	0.057
Sad				0.016		0.043	0.1	Sad			0.1	0.024		0.022	0.13	Sad	0.092			0.011		0.016	0.11
urprise	0.016	0.019	0.065		o	0.66	0.052	rprise		0.038			0.0082	0.52	0.071	rprise	0.052	0.041		0.2	0.0027	0.44	0.13
3				Dynamic				3				Static				3				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	Нарру	Sad	Surprise	Null		Anger	Disgust	Fear	Нарру	Sad	Surprise	Null		Anger	Disgust	Fear	Нарру	Sad	Surprise	Null
Anger	0.69	0.12		0	0.099	0.013	0.041	Anger		0.14	0.05	0		0.015	0.042	Anger		0.056	0.071	0.002		0.004	0.097
Disgust	0.13		0.011	0		0.013	0.026	Disgust		0.75	0.017	0		0.01	0.017	Disgust	0.19		0.046	o		0.004	0.06
Fear	0.0086	0.015		0.0022			0.054	Fear				0.0021			0.081	Fear				0.0081	0.048		0.093
Happy	0.0022	0.0065	0.0043	0.97	0.0043	0.0065	0.011	Happy	0.0021	0.027		0.92	0.0042	0.01	0.023	Happy	0.012		0.012	0.91	0.012	0.0081	0.022
Sad		0.082		0.0043		0.022		Sad		0.069		0.0021		0.023	0.098	Sad	0.056			0.002		0.006	0.079
aprise	0.0065	0.0065			o	0.73	0.011	urprise	0.019	0.025			0.0021	0.69	0.037	urprise	0.032	0.006	0.17		0.002	0.62	0.065
ß				Dynamic				ß				Static				3				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	Нарру	Sad	Surprise	Null		Anger	Disgust	Fear	Нарру	Sad	Surprise	Null		Anger	Disgust	Fear	Нарру	Sad	Surprise	Null
Anger		0.093	0.068	0.0019	0.12	0.064	0.042	Anger		0.1	0.061	0.011		0.045	0.04	Anger		0.081	0.11	0.013		0.025	0.044
Disgust			0.045	0.0019		0.034	0.015	Disgust				0.0019		0.038	0.023	Disgust			0.095	0.0095		0.023	0.034
Fear		0.028			0.038		0.034	Fear		0.042					0.049	Fear	0.085						0.091
Happy	0.0057	0.0076	0	0.92	0.0038	0.036	0.03	Happy	0.013	0.0057	0.011	0.92		0.025	0.017	Happy	0.066	0.0095	0.021	0.77	0.015	0.055	0.059
Sad		0.085		0.013		0.11	0.074	Sad		0.089		0.019		0.1	0.057	Sad		0.066		0.015		0.061	0.044
rprise	0.013	0.013	0.032	0.21	0.0038	0.71	0.019	rprise		0.011		0.27	0.0057	0.57	0.034	urprise		0.023	0.087	0.3	0.017	0.41	0.057
3		Dynamic d Static d 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	Нарру	Sad	Surprise	Null		Anger	Disgust	Fear	Нарру	Sad	Surprise	Null		Anger	Disgust	Fear	Нарру	Sad	Surprise	Null
Anger		0.2		0.0063		0.11	0.04	Anger		0.14		0.017	0.15	0.075	0.083	Anger		0.15	0.13	0.015		0.093	0.05
Disgust						0.035	0.04	Disgust				0.015	0.11	0.058	0.03	Disgust		0.33		0.013		0.065	0.056
Fear		0.037					0.04	Fear	0.042			0.051	0.056		0.1	Fear		0.08					0.097
Happy	0.0063	0.023	0.0042	0.86	0.0063	0.075	0.029	Happy	0.029	0.023	0.04	0.76	0.015	0.069	0.062	Happy		0.039	0.069		0.045	0.13	0.075
Sad				0.017		0.19	0.1	Sad				0.021		0.16	0.1	Sad		0.18		0.026		0.13	0.062
rprise		0.015		0.27	o	0.62	0.025	urprise		0.033		0.25	0.015	0.51	0.067	urprise		0.056	0.14	0.17	0.032		0.084
3				Dynamic				3				Static				3				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 ( $\Delta$  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 ( $\Delta$ 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.