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Brief communication

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Perception of the old-age threshold and the demographic context: an empirical verification using the European Social Survey data

Abstract

The theory of cognitive psychology states that perception depends on the context. For example, the way of perceiving brightness depends on the surrounding: objects may appear darker or brighter when exposed to a white or black background. This article verifies whether the demographic surrounding affects the perception of the old-age threshold. We hypothesize that among people of a certain age, the onset of the old-age is perceived as higher in older populations (with a high number of older adults) and as lower in younger populations (with only a few elderly individuals). The research process involves two approaches: (1) across countries and (2) over time. To evaluate the relationship between demographic and psychological variables measures of correlation are used to analyze data from the European Social Survey (rounds 3 and 9). The results show that the differences in the perception of the old-age threshold are not associated with a demographic context.

Keywords: old-age threshold, perception, context effect, demographic situation

Introduction

Cognitive psychology states that context is of key importance to perception (Lloyd Leslie, 2013; Meyers-Levy, Zhu, & Jiang, 2010; Nikolić, 2010). A phenomenon when the perception of an object changes with the change in context, without any change of that object itself, is called the "context effect" (Todorović, 2010). A classic example is a perception of brightness: a medium-gray patch appears darker when placed against a bright background and brighter when placed against a dark background (Adelson, 1993). Such situations are evident in many commonplace settings. For instance, an individual of average intelligence may appear less capable among highly gifted peers and more insightful among those of lower ability. As such, the perceived boundary between wisdom and folly depends partly on the surrounding context.

As individuals age, they tend to perceive the onset of old age as occurring later in life (Błędowski, 2020; Cameron, 1969; Chopik et al., 2018; Drevenstedt, 1976; Kuper & Marmot, 2003;). Weiss and Lang (2012) and Weiss and Kornadt (2018) have described this phenomenon as the *age-group dissociation effect*. Since old age is linked with negative attributes (senility, unattractiveness, burden, frailty), older adults tend to distance themselves from it in order to avoid stigma and improve subjective well-being. They create a mental distance by retarding the onset of old age. It allows them to identify as part of the younger age group for a longer time. It is a kind of defensive denial by which they *dissociate* from being *old*. This theoretical concept seems to be plausible, although it does not have strong empirical confirmation (Jurek, 2022).

The international comparisons (Ayalon et al., 2014; Jurek, 2021) show that perception of the old-age threshold among people of the same age differs from country to country. The question is, whether the demographic environment causes such differentiation. Do the median age of the population, or the share of people considered in gerontological studies as "old" (aged 65+) or "very old" (aged 85+) play a role?

Thus, in this article, we want to verify whether the perception of the old-age threshold depends on the demographic situation. To the best of our knowledge, this problem has no been the subject of research so far. Based on the "context effect" it can be presumed that a middle-aged person appears young among older adults and old among youngsters. Therefore, theoretically, the old-age threshold should be higher in the old populations and lower in the young populations. We will provide empirical verification of this assumption.

Perception of the old-age threshold is a complex and multidimensional issue. It depends on both: personal characteristics (micro-level factors), and environmental

arrangement (macro-level factors). Personal characteristics are, among others, age (Cameron, 1969; Chopik et al., 2018; Drevenstedt, 1976), gender (Barrett & Von Rohr, 2008; Kuper & Marmot, 2003), and socioeconomic status (Kuper & Marmot, 2003; Peters, 1971). Environmental arrangement are, among others, cultural background (Frackowiak et al., 2020), economic situation (Ayalon et al., 2014), and institutional settings (Jurek, 2021). With this article we want to expand knowledge on macro-level factors.

The main aim of this paper is to evaluate the relationship between demographic situation and the perception of the old-age threshold. Basing on the "context effect" we put forward two hypotheses:

H1: People of a certain age living in a country with an older population perceive the old-age threshold as higher than people of the same age living in a country with a younger population.

H2: As the population is getting older, people of a certain age perceive the onset of old-age as being higher.

In order to verify those hypotheses, two approaches are applied: (1) across countries, and (2) over time. The first approach involves a comparison of the situation in a different country at the same time. In such a case, a demographic factor is juxtaposed with a psychological factor. The second approach focuses on changes over time in a certain country. In such a case, the change in a psychological factor is juxtaposed with the change in a demographic factor.

The demographic factor reflects the development of the process of population ageing. We take into account three variables: (1) median age of population, (2) share of old people (aged 65+), (3) share of very old people (aged 85+).

The psychological factor is linked with a perception of the old-age threshold. To obtain a country-level variable, individual impressions are aggregated (an average value) in ten-year age-cohorts. Such a variable reflects an average (subjective) old-age threshold among people in their 10s, 20s, 30s, 40s, and so on.[1]

To evaluate the relationship between demographic and psychological variables, analysis of correlation coefficients will be used.

We will verify whether people of a certain age living in older populations (countries) perceive the old-age threshold as higher than their peers living in younger populations (countries). Potentially high and positive values of correlation coefficients would mean that in the older population the old-age threshold is perceived as higher. It would support hypothesis H1.

[1] Ten-year age-cohort aggregation is forced by the insufficiently large sample size of each cohort in case of more detailed data (exact age).

We will also verify whether the change in the demographic factor is interconnected with the change in the psychological factor. Potentially high and positive values of correlation coefficients would mean that change in the demographic context takes place simultaneously with a change of perception. Namely, as the population is getting older, the old-age threshold is perceived as higher. It would support hypothesis H2.

Since we do not control the influence of the other variables, it needs to be assumed that it is the same across countries (the first approach) and over time (the second approach). We focus only on the link between the demographic context and subjective perception.

Data and the method

Data

In this paper data from the *European Social Survey* (ESS) and *World Population Prospects* were used. The *European Social Survey* is a cyclical survey carried out since 2002 (every two years).[2] It consists of two modules: fixed and rotating. The fixed module is repeated in every round, and the rotating module changes with every round. Data is collected via face-to-face CAPI interviews. Respondents are people aged 15+.

So far, perception of the old-age threshold has been the subject of the survey only twice, under the "timing of life" rotating module, in round 3 (in 2006) and round 9 (in 2018). In round 3 23 countries took part. Initially, the total sample was 43,000, however, some cases were excluded due to a lack of relevant data (38,255 remained). The sample size by country and age-cohort is presented in Table 1. In round 9 29 countries took part. Initially, the total sample was 49,519, however, some cases were excluded due to a lack of relevant data (44,393 remained). The sample size by country and age is presented in Table 2.

The *World Population Prospects* are a database with the estimates and the projections of demographic indicators for all regions and countries published by the United Nation's Population Division[3] every 2 years. It provides reliable and accessible data for all countries all over the world. The use of unified concepts and categories enables effective comparisons over time and across countries.

[2] Detailed information on this study is available on the website: www.europeansocialsurvey.org

[3] United Nations, Department of Economic and Social Affairs, Population Division (2019). *World Population Prospects 2019*, custom data acquired via website https://population.un.org/wpp

In our study, three demographic variables are taken into account: (1) median age, (2) share of old people, and (2) share of very old people. In order to ensure correspondence with the psychological variable (from ESS), demographic measures were taken for the same countries and for the same time.

Table 1. Sample size by country and age-cohort in European Social Survey round 3

country	overall	10s	20s	30s	40s	50s	60s	70s	80s
Austria	2,044	177	318	293	491	315	242	136	72
Belgium	1,695	149	252	259	342	275	191	176	51
Bulgaria	1,200	51	143	164	183	233	232	152	42
Cyprus	771	48	116	122	159	138	106	63	19
Denmark	1,266	61	130	241	228	230	224	97	55
Estonia	1,302	107	201	195	205	216	184	142	52
Finland	1,779	115	263	268	272	322	295	162	82
France	1,826	95	211	356	358	326	249	169	62
Germany	2,543	155	333	368	545	429	373	231	109
Hungary	1,421	46	177	233	194	253	250	184	84
Ireland	1,491	65	242	296	292	221	187	141	47
Netherlands	1,771	57	208	349	353	289	262	169	84
Norway	1,710	120	246	302	358	283	212	123	66
Poland	1,647	150	311	261	269	295	168	146	47
Portugal	1,965	78	247	339	280	298	320	284	119
Russian Federation	2,036	149	347	327	338	322	254	234	65
Slovakia	1,536	123	291	297	258	264	158	106	39
Slovenia	1,277	116	198	174	223	232	160	129	45
Spain	1,786	115	300	339	329	233	197	169	104
Sweden	1,743	120	267	297	291	302	254	131	81
Switzerland	1,451	67	159	263	306	223	233	127	73
Ukraine	1,763	86	277	267	240	321	284	214	74
United Kingdom	2,232	107	278	400	393	344	335	220	155

Source: own elaboration based on ESS data.

Table 2. Sample size by country and age-cohort in European Social Survey round 9

country	overall	10s	20s	30s	40s	50s	60s	70s	80s
Austria	2,208	62	275	320	371	419	356	309	96
Belgia	1,649	116	253	257	244	297	255	137	90
Bulgaria	1,974	81	120	193	340	367	404	341	128
Croatia	1,656	54	171	242	267	309	343	196	74
Cyprus	684	13	59	100	105	114	123	109	61

cont. Table 2

country	overall	10s	20s	30s	40s	50s	60s	70s	80s
Czechia	1,906	68	260	300	347	350	313	216	52
Denmark	1,460	95	210	184	236	236	249	182	68
Estonia	1,624	96	202	261	258	255	263	177	112
Finland	1,679	98	207	229	242	292	305	214	92
France	1,800	80	183	292	273	307	320	216	129
Germany	2,122	146	299	290	306	392	392	205	92
Hungary	1,617	63	192	218	298	257	289	212	88
Iceland	810	49	91	126	126	155	148	82	33
Ireland	2,039	49	177	344	357	366	369	271	106
Italy	2,483	133	311	288	403	467	375	312	194
Latvia	768	17	61	92	124	148	154	111	61
Lithuania	1,475	31	129	153	188	301	323	248	102
Montenegro	1,139	40	161	180	207	220	196	92	43
Netherlands	1,518	120	194	213	255	279	238	167	52
Norway	1,300	93	193	195	243	232	183	130	31
Poland	1,346	86	193	236	211	179	249	127	65
Portugal	918	38	97	128	163	164	133	150	45
Serbia	1,827	69	158	212	289	326	399	257	117
Slovakia	969	27	64	123	120	169	256	160	50
Slovenia	1,203	80	138	189	203	211	203	123	56
Spain	1,467	91	189	239	268	282	187	138	73
Sweden	1,401	52	173	181	203	242	241	226	83
Switzerland	1,268	94	200	208	206	203	181	126	50
United Kingdom	2,083	61	192	358	327	381	340	278	146

Source: own elaboration based on ESS data.

Method

The study was conducted in two analytical approaches: across countries and over time.

In the first (across country) approach, the analysis was based on data from two rounds of the *European Social Survey* (2006 and 2018). For each country and each ten-year age cohort, the mean perceived old-age threshold was calculated. These aggregated values constituted the psychological variable. The demographic variables included the median age of the population, the proportion of people aged 65 and over, and the proportion of people aged 85 and over, obtained from the United Nations *World Population Prospects*. Pearson correlation coefficients were computed between the psychological variable and each demographic variable, separately for each age cohort and survey round.

In the second ("over time") approach, the analysis focused on countries that participated in both ESS rounds (n=21). For each of these countries and each age cohort, the change in the psychological variable was calculated as the difference between its value in 2018 and 2006. Changes in the demographic variables were calculated analogously. Pearson correlation coefficients were then calculated between changes in the psychological variable and changes in each demographic variable. These calculations were performed separately for each age cohort, to assess whether shifts in the demographic context were associated with shifts in the perceived old-age threshold.

Results

Perception of the old-age threshold

In the *European Social Survey* the question about the old-age threshold was phased: "And at what age, approximately, would you say women/men reach old age?". Answers were numerical. Results aggregated for ten-year age-cohorts are presented in Table 3 (round 3), and Table 4 (round 9).

The old-age threshold increases with every next age-cohort. On average, people in their 80s perceive the onset of old-age eight years higher than people in their 10s. Perception also varies from country to country. According to round 3, among people in their 50s, a threshold is perceived at the lowest level in Hungary (63.01), and the highest in Denmark (73.28). The difference between those two extremes is over ten years. According to round 9, it is the lowest in Croatia (61.47), and the highest in Denmark (73.20). In this case, the difference between extremes is almost twelve years.

Table 3. The subjective old-age threshold (in years) aggregated in a ten-year age-cohorts by country in 2006

country	10s	20s	30s	40s	50s	60s	70s	80s
Austria	63.69	65.23	68.42	69.44	69.81	70.75	70.79	70.26
Belgia	64.19	65.87	68.53	69.62	70.11	70.40	71.50	72.35
Bulgaria	62.51	61.90	62.72	64.45	65.56	65.75	67.74	65.71
Cyprus	63.50	67.25	67.12	68.40	69.46	70.35	71.43	75.74
Denmark	62.51	66.11	69.04	70.31	73.28	73.69	74.63	76.33
Estonia	59.81	62.48	63.73	64.45	64.56	65.88	67.00	69.65
Finland	62.03	63.51	65.91	66.86	69.52	69.96	71.98	73.29

cont. Table 3

country	10s	20s	30s	40s	50s	60s	70s	80s
France	61.98	65.06	68.04	69.93	71.27	72.32	72.22	72.35
Germany	59.06	61.41	63.87	65.50	66.49	68.16	68.23	68.77
Hungary	58.04	60.01	60.83	61.76	63.01	63.56	63.40	65.33
Ireland	65.95	67.77	69.26	70.88	71.23	71.83	71.28	75.53
Netherlands	68.95	69.86	70.73	70.69	71.42	72.24	71.22	72.56
Norway	64.64	66.37	68.86	70.30	71.46	72.25	73.80	75.32
Poland	57.51	60.98	62.82	63.05	63.69	63.43	65.75	65.00
Portugal	66.35	67.43	68.75	69.50	69.54	69.60	70.63	72.10
Russian Federation	60.84	62.59	64.40	64.76	65.06	66.11	65.90	68.11
Slovakia	61.91	62.46	64.35	65.41	64.99	65.06	66.47	68.46
Slovenia	58.53	61.09	63.98	65.17	65.31	65.47	66.12	67.44
Spain	63.76	64.85	65.32	66.96	67.60	67.37	68.01	68.28
Sweden	59.68	63.24	67.24	68.71	69.04	71.03	72.89	72.38
Switzerland	60.19	65.50	68.06	69.47	71.65	72.05	72.56	73.37
Ukraine	61.31	62.69	63.83	65.56	65.35	65.44	66.02	66.38
United Kingdom	63.45	65.93	67.77	68.57	69.32	70.37	70.42	72.06

Source: own elaboration based on ESS data (round 3) and UN's demographic data.

Table 4. The subjective old-age threshold (in years) aggregated in a ten-year age-cohorts by country in 2018

country	10s	20s	30s	40s	50s	60s	70s	80s	%65+	%85+
Austria	64.73	67.65	70.43	72.07	72.46	73.34	72.69	71.65	18.99%	2.60%
Belgium	65.66	67.14	70.03	69.91	70.58	71.68	72.06	71.31	18.79%	2.91%
Bulgaria	61.10	64.04	65.75	65.73	66.31	67.00	66.98	68.02	21.04%	2.03%
Switzerland	63.00	65.28	68.04	70.28	70.06	72.77	74.68	74.30	18.63%	2.64%
Cyprus	70.38	69.80	70.44	69.58	71.54	72.13	74.63	76.20	13.78%	1.34%
Czechia	60.03	63.81	64.86	65.23	66.48	66.72	67.59	67.92	19.42%	2.01%
Germany	60.29	61.13	63.33	66.43	67.24	68.62	69.26	70.37	21.46%	2.96%
Denmark	63.20	66.92	70.27	71.43	73.20	74.06	76.16	76.13	19.81%	2.17%
Estonia	61.20	64.54	65.56	66.28	66.63	66.42	69.67	69.15	19.65%	2.57%
Spain	62.57	66.33	66.76	68.57	67.95	68.16	67.99	67.34	19.38%	3.38%
Finland	64.20	64.97	67.16	68.85	68.81	70.44	73.02	71.78	21.69%	2.70%
France	62.73	65.39	67.97	70.07	71.60	73.28	74.56	74.36	20.04%	3.35%
United Kingdom	62.82	66.78	68.64	70.73	70.63	70.86	72.22	72.95	18.40%	2.55%
Croatia	57.28	58.75	60.64	61.52	61.47	62.53	62.86	64.47	20.46%	2.43%
Hungary	62.51	62.92	63.15	64.71	64.44	64.72	65.15	63.84	19.17%	1.98%
Ireland	67.63	68.15	71.03	71.95	73.04	73.22	73.63	74.28	13.86%	1.39%
Iceland	66.33	67.95	70.60	71.48	71.97	72.67	72.62	73.39	14.88%	2.08%
Italy	68.62	70.39	71.77	72.56	73.04	73.84	73.44	73.78	22.75%	3.56%

country	10s	20s	30s	40s	50s	60s	70s	80s	%65+	%85+
Lithuania	64.65	67.34	69.01	71.14	71.10	71.29	73.44	74.66	19.69%	2.89%
Latvia	63.41	67.72	70.29	72.55	71.90	74.53	74.35	74.11	20.03%	2.85%
Montenegro	65.25	62.28	64.18	65.55	66.09	66.84	68.43	69.02	14.99%	1.28%
Netherlands	67.02	69.56	71.96	71.91	72.51	72.96	72.89	75.04	19.20%	2.27%
Norway	64.65	66.24	68.28	70.16	71.34	72.35	74.43	76.39	17.08%	2.23%
Poland	63.05	64.96	65.19	66.35	66.77	67.32	67.43	68.06	17.52%	2.16%
Portugal	69.45	69.06	70.21	71.12	72.16	73.86	72.25	73.96	21.96%	3.05%
Serbia	60.22	62.15	64.70	65.54	65.48	66.51	66.55	66.77	18.35%	1.59%
Sweden	62.58	64.38	66.99	69.48	70.92	70.90	72.96	73.59	20.08%	2.68%
Slovenia	60.56	60.99	63.85	65.92	66.20	68.43	68.85	69.13	19.59%	2.50%
Slovakia	63.93	65.56	64.87	65.17	65.24	65.56	65.65	70.12	15.62%	1.47%

Source: own elaboration based on ESS data (round 9) and UN's demographic data.

21 countries took part in both rounds. The time interval between rounds was 12 years (2006–2018). In that period, the perception of the old-age threshold changed (see Table 5). In general, the subjective threshold increased by 1.5 years, but this value varies from country to country and from one age-cohort to another. The increment among, for example, people in their 50s was the smallest in Switzerland (–1.6), and the biggest in Poland (3.08). It means that in Switzerland the perceived onset of old age decreased by 1.6 years, whereas in Poland increased by 3.08 years. As for people in their 60s, the increment was the smallest in Sweden (–0.13), and the highest in Portugal (4.27).

Table 5. Changes in the subjective old-age threshold (in years), 2006–2018

country	Δ 10s	Δ 20s	Δ 30s	Δ 40s	Δ 50s	Δ 60s	Δ 70s	Δ 80s
Belgia	1.47	1.27	1.50	0.29	0.47	1.28	0.56	–1.04
Germany	1.23	–0.28	–0.54	0.94	0.76	0.46	1.03	1.60
United Kingdom	–0.63	0.85	0.87	2.16	1.31	0.49	1.80	0.89
Norway	0.00	–0.13	–0.58	–0.15	–0.11	0.10	0.63	1.07
Austria	1.03	2.42	2.00	2.63	2.65	2.59	1.90	1.38
Estonia	1.38	2.06	1.83	1.83	2.08	0.55	2.67	–0.50
Switzerland	2.81	–0.23	–0.02	0.80	–1.60	0.72	2.12	0.93
Spain	–1.19	1.49	1.44	1.61	0.36	0.79	–0.02	–0.94
Sweden	2.89	1.15	–0.24	0.77	1.88	–0.13	0.07	1.21
Cyprus	6.88	2.55	3.32	1.18	2.08	1.78	3.20	0.46
Ireland	1.68	0.38	1.77	1.07	1.80	1.39	2.34	–1.25
Hungary	4.46	2.91	2.32	2.95	1.43	1.16	1.75	–1.49
France	0.75	0.34	–0.08	0.14	0.33	0.96	2.33	2.01
Bulgaria	–1.41	2.15	3.03	1.28	0.76	1.25	–0.76	2.30

cont. Table 5

country	Δ 10s	Δ 20s	Δ 30s	Δ 40s	Δ 50s	Δ 60s	Δ 70s	Δ 80s
Slovenia	2.04	–0.11	–0.13	0.74	0.89	2.96	2.72	1.68
Slovakia	2.02	3.11	0.52	–0.24	0.25	0.50	–0.82	1.66
Poland	5.53	3.98	2.37	3.30	3.08	3.89	1.69	3.06
Denmark	0.69	0.82	1.23	1.12	–0.07	0.37	1.54	–0.19
Portugal	3.10	1.63	1.46	1.63	2.61	4.27	1.62	1.85
Netherlands	–1.93	–0.30	1.23	1.22	1.09	0.72	1.67	2.48
Finland	2.18	1.46	1.25	1.99	–0.72	0.48	1.04	–1.51

Source: own elaboration based on ESS data (round 3 and 9).

Demographic situation

The value of demographic variables under study (median age, share of old people, and share of very old people) are presented in Table 6 (from 2006), and Table 7 (from 2018).

The demographic situation varies among the analyzed countries. The median age was the lowest in Cyprus (in 2016) and Iceland (in 2018), and the highest in Germany (in 2006) and Italy (in 2018). The difference between extremes (minimum and maximum values) was almost 10 years. As for the share of old people (65+), it was the lowest in Ireland (in 2006) and Cyprus (in 2018), and the highest in Germany (in 2006) and Italy (in 2018). This measure in the oldest population is almost twice as high as in the youngest. As for the share of very old people (85+), it was the lowest in the Russian Federation (in 2006) and Montenegro (in 2018), and the highest in Sweden (in 2006) and Italy (in 2018). In this case, the highest share is almost three times as high as the lowest.

Table 6. Demographic indicators (median age, share of old and very old people) by country in 2006

country	median age	%65+	%85+
Austria	39.29	16.49	1.76
Belgia	39.36	17.32	1.79
Bulgaria	40.26	17.49	1.05
Cyprus	31.80	10.73	0.96
Denmark	38.78	15.41	1.98
Estonia	38.52	17.05	1.26
Finland	40.18	16.20	1.76
France	38.23	16.52	1.99
Germany	41.59	19.32	1.83

country	median age	%65+	%85+
Hungary	38.05	15.72	1.19
Ireland	32.36	10.57	1.16
Netherlands	38.45	14.33	1.56
Norway	37.11	14.78	2.22
Poland	35.91	13.18	0.95
Portugal	38.87	17.44	1.76
Russian Federation	36.50	13.82	0.80
Slovakia	34.81	11.78	0.83
Slovenia	39.05	15.82	1.20
Spain	37.91	16.70	1.93
Sweden	39.34	17.40	2.56
Switzerland	39.58	15.96	2.08
Ukraine	38.00	16.05	0.91
United Kingdom	37.86	16.11	2.02

Source: own elaboration based on the UN's demographic data (*World Population Prospects*).

Table 7. Demographic indicators (median age, share of old and very old people) by country in 2018

country	median age	%65+	%85+
Austria	42.27	18.99	2.60
Belgia	40.63	18.79	2.91
Bulgaria	43.53	21.04	2.03
Croatia	42.99	20.46	2.43
Cyprus	36.19	13.78	1.34
Czechia	41.51	19.42	2.01
Denmark	41.05	19.81	2.17
Estonia	41.05	19.65	2.57
Finland	41.76	21.69	2.70
France	41.03	20.04	3.35
Germany	45.00	21.46	2.96
Hungary	41.78	19.17	1.98
Iceland	35.40	14.88	2.08
Ireland	36.50	13.86	1.39
Italy	45.57	22.75	3.56
Latvia	42.87	20.03	2.85
Lithuania	43.00	19.69	2.89
Montenegro	37.39	14.99	1.28
Netherlands	41.55	19.20	2.27
Norway	38.59	17.08	2.23

cont. Table 7

country	median age	%65+	%85+
Poland	39.80	17.52	2.16
Portugal	44.02	21.96	3.05
Serbia	42.30	18.35	1.59
Slovakia	39.42	15.62	1.47
Slovenia	42.37	19.59	2.50
Spain	42.78	19.38	3.38
Sweden	39.63	20.08	2.68
Switzerland	41.47	18.63	2.64
United Kingdom	39.14	18.40	2.55

Source: own elaboration based on the UN's demographic data (*World Population Prospects*).

Table 8 presents changes in demographic variables that took place over the period of 12 years (2006–2018) among 21 countries that took part in both rounds of the ESS (3 and 9). In all the analyzed countries, the median age of population increased, the most in Portugal (5.15), and the least in Sweden (0.29). The same with the share of old people (aged 65+). It increased in all the analyzed countries, the most in Finland (by almost 5.5 percentage points) and the least in Belgium (by almost 1.5 percentage points). As for the share of very old people (aged 85+), only in Norway it did not change. In all other countries it increased, the most in Spain (by 1.45 percentage points).

Table 8. Changes in demographic indicators: median age (in years), the share of old and very old people (in percentage points), in 2006–2018, by country

country	Δ median age	Δ %65+	Δ %85+
Belgia	2.98	1.47	1.12
Germany	1.27	2.14	1.13
United Kingdom	3.27	2.28	0.53
Norway	4.39	2.29	0.00
Austria	2.28	2.50	0.84
Estonia	2.53	2.60	1.31
Switzerland	1.58	2.67	0.56
Spain	2.80	2.68	1.45
Sweden	3.41	2.69	0.12
Cyprus	3.72	3.05	0.39
Ireland	4.13	3.29	0.23
Hungary	3.11	3.45	0.78
France	1.48	3.52	1.36
Bulgaria	3.89	3.55	0.98

country	Δ median age	Δ %65+	Δ %85+
Slovenia	5.15	3.77	1.30
Slovakia	4.61	3.84	0.63
Poland	3.32	4.34	1.21
Denmark	4.87	4.41	0.19
Portugal	0.29	4.52	1.29
Netherlands	1.89	4.87	0.70
Finland	1.28	5.49	0.94

Source: own elaboration based on the UN's demographic data.

Perception of the old-age threshold in the demographic context: approach across the countries

International comparison shows that peers in European countries differ greatly in terms of their perception of the old-age threshold. For example, among people in their 50s it is perceived as 61.5 in Croatia and 73 in Italy (round 9). As so, the difference is over eleven years. The question is whether such a difference is linked anyhow with the difference in the demographic situation. Does the median age or the share of elderly people correlate with the perceived old-age threshold?

Table 9. Correlation coefficients between the perceived old-age threshold and demographic indicators (median age, share of old and very old people) in 2006 and 2018

Variable	ESS 2006			ESS 2018		
	median age	%65+	%85+	median age	%65+	%85+
perception among those in their 10s	–0.21	–0.20	0.18	–0.34	–0.33	–0.05
perception among those in their 20s	–0.27	–0.27	0.36	–0.19	–0.15	0.16
perception among those in their 30s	–0.10	–0.13	0.57*	–0.19	–0.11	0.21
perception among those in their 40s	–0.08	–0.08	0.61*	–0.11	–0.01	0.35
perception among those in their 50s	0.00	–0.04	0.66*	–0.18	–0.05	0.29
perception among those in their 60s	0.03	0.00	0.70*	–0.10	0.02	0.34
perception among those in their 70s	0.06	0.03	0.72*	–0.21	–0.04	0.28
perception among those in their 80s	–0.23	–0.24	0.52*	–0.27	–0.14	0.16
		N=23			N=29	

* significant at $p < 0.05$

Source: own elaboration based on ESS data (round 3 and 9) and the UN's demographic data.

Table 9 shows correlation coefficients between the perceived old-age threshold and demographic indicators (median age, share of old and very old people) in 2006

and 2018. The coefficients are significant (at $p < 0.05$) only under round 3, and only according to the share of very old people (aged 85+). There is a moderate positive correlation among people in their 30s, 40s, 50s, and 80s, and among people in their 60s and 70s it is even stronger.

As for the median age as well as for the share of old people (aged 65+), under both rounds, correlation coefficients are statistically insignificant and mostly negative, which is contrary to the hypothesis.

Basing on ESS data, the first hypothesis (H1) cannot be confirmed. There is no empirical evidence that the demographic situation is related to the perception of the onset of old age. There are relatively young populations with a high subjective old-age threshold (such as Ireland and Cyprus), and also, on the opposite side, relatively old populations with a low subjective threshold (such as Bulgaria and Germany).

Perception of the old-age threshold in the demographic context: the approach over time

An over-time comparison shows that the perception of the old-age threshold differs at particular points of time. In Poland, for example, in 2018 an average person aged 50–60 perceived the onset of old age as over 3 years higher than his or her peer 12 years earlier. The question is whether this change is linked anyhow with a change in the demographic situation? Does the increase in the median age or in the share of older people correlate with an increase in the subjective threshold?

For each country and each age cohort, the change in the psychological variable was calculated as the difference between the 2018 value and the 2006 value. Similarly, changes in demographic variables were calculated as differences between the corresponding 2018 and 2006 values. The analysis then examined the relationship between these changes, not between the raw levels of variables. Specifically, Pearson correlation coefficients were computed between the change in perception (for each age cohort) and the change in each demographic indicator. This procedure produced a results table (Table 10) in which:

- rows correspond to age cohort;,
- columns correspond to the three demographic indicators;
- each cell contains the correlation coefficient describing the association between paired changes in demographic and psychological variables, calculated separately for each age cohort.

The coefficients are statistically significant (at $p<0.05$) only in one case, according to the change in the perception among people in their 60 s in relation to the change in the share of very old people (aged 85+). The correlation coefficient is positive and

weak (0.45). It means that the increase in the share of very old people takes place at the same time as the increase in the subjective old-age threshold.

Basing on the obtained results, the second hypothesis (H2) cannot be confirmed. There is no empirical evidence that a change in the demographic situation implies a change in the perception of the old-age threshold. Despite an increase in the median age as well as in the share of old people, in some cases the perception remained unchanged or even decreased (such as in Finland or Denmark).

Table 10. Correlation coefficients between changes in perceived old-age threshold and changes in demographic indicators (median age, share of old and very old people), 2006–2018

Variable	Δ median age	Δ %65+	Δ %85+
Δ perception among those in their 10s	0.01	0.10	–0.06
Δ perception among those in their 20s	0.13	0.16	0.18
Δ perception among those in their 30s	0.07	0.20	0.12
Δ perception among those in their 40s	–0.23	0.23	0.25
Δ perception among those in their 50s	–0.01	0.00	0.15
Δ perception among those in their 60s	–0.14	0.28	0.45*
Δ perception among those in their 70s	–0.14	0.06	0.05
Δ perception among those in their 80s	–0.06	0.16	0.12
		N=21	

* significant at $p < 0.05$

Source: own elaboration based on ESS data (round 3 and 9) and the UN's demographic data.

Conclusion

The determinants of the perception of the old-age threshold are an important and complex research problem with practical implications for public policy, the labour market and the silver economy. While most studies have focused on micro-level factors such as age, gender and socio-economic status, contextual (meso- and macro-level) factors have received much less attention. However, according to cognitive psychology, perception is inherently context-dependent (Todorović, 2010), providing a strong theoretical rationale for expecting the demographic environment to influence perceptions of ageing.

This study aimed to verify empirically this assumption by analyzing correlations between demographic indicators and the subjective old-age threshold across countries and over time. Contrary to expectations, however, the results provided no consistent evidence to support the hypotheses. Higher median age and a greater proportion

of older people in a population were not systematically associated with perceiving the onset of old age as occurring later, and changes in demographic indicators did not correspond to shifts in the perception over time.

One possible explanation to this is the relatively low variance in demographic indicators across the analyzed countries; all of the participating societies were already in an advanced stage of demographic ageing. However, it is worth noting that recent demographic trends in Europe suggest an emerging divergence. While the Nordic, Western, and Southern European countries were previously the oldest, many Central and Eastern European countries are ageing faster and are projected to surpass them in median age within the next few decades (Długosz, 2011; Lutz, Sanderson & Scherbov, 2008). This dynamic transformation could potentially alter contextual effects and should be closely monitored in future research.

Another explanation relates to the level of analysis. Context effects may be more powerful in the immediate social environment. People tend to compare themselves with those they interact with directly, such as their neighbours, colleagues or fellow community members. As the proportion of older adults is often lower in metropolitan areas and higher in rural regions, country-level measures may be too aggregated to capture these nuanced effects. This highlights the need for future studies to be conducted at smaller spatial scales. These studies should integrate micro-level survey data with meso-level (regional or municipal) and macro-level (national) indicators within a multi-level modelling (MLM) framework (Hox, 2010). This would allow individual determinants to be disentangled from contextual influences, and enable cross-level interactions to be formally tested (e.g. whether the effect of chronological age on the perceived old-age threshold varies with local demographic composition).

Furthermore, the perception of the old-age threshold is likely influenced by subjective rather than purely objective age-related cues. The concept of subjective age (the age a person feels compared to their chronological age) has been widely studied (Kotter-Gruhn, Kornadt, & Stephan, 2015; Shiovitz-Ezra & Ayalon, 2010; Westerhof & Wurm, 2015). Findings indicate that individuals often feel younger than their actual age, and this feeling is associated with better health, higher life satisfaction, and a lower risk of mortality. It is plausible that subjective age mediates or moderates the relationship between demographic context and old-age threshold perception, as individuals may base their judgements on how old they feel rather than population statistics. Therefore, incorporating subjective age measures, as found in the SHARE dataset, could improve the explanatory power of future analyses.

The study has also its methodological limitations. The necessity to aggregate data into ten-year cohorts, driven by constraints on sample size, has inevitably reduced the

level of detail and may have obscured age-specific patterns. The absence of controls for other micro-level characteristics (such as education, income, or health status) also restricts interpretation. Future research should apply more advanced statistical methods, such as multi-level regression models with random slopes, to control for personal characteristics, while testing for demographic context effects. Comparative designs could also benefit from harmonized individual-level data that links perception measures with personal and local demographic indicators.

In summary, while the current findings do not confirm the hypothesized contextual effects at the national level, they suggest promising avenues for further research, including:

- examining more heterogeneous demographic settings, including rapidly ageing societies;
- conducting analyses at multiple spatial scales;
- integrating subjective age concepts into explanatory models;
- employing multi-level and longitudinal methods to capture better dynamic interactions between individuals and their demographic environments.

Such an agenda would deepen our understanding of the perceptual boundaries of ageing and inform policies aimed at mitigating age-related stereotypes and promoting active ageing.

References

[1] Adelson, E.H. (1993). Perceptual organization and the judgment of brightness. *Science*, 262(5142). DOI:10.1126/science.8266102.

[2] Ayalon, L. et al. (2014). Macro- and micro-level predictors of age categorization: results from the European Social Survey. *European Journal of Ageing*, 11(1), pp. 5–18. DOI:10.1007/s10433-013-0282-8.

[3] Barrett, A.E. & Von Rohr, C. (2008). Gendered perceptions of aging: An examination of college students. *International Journal of Aging and Human Development*, 67(4), pp. 359–386. DOI:10.2190/AG.67.4.d.

[4] Błędowski, P. (2020). Czas jest względny. Wybrane aspekty starości z perspektywy przebiegu życia. In: P.B. Sztabiński, D. Przybysz, & F. Sztabiński (Eds.), *Polska-Europa. Wyniki Europejskiego Sondażu Społecznego 2002–2018/19* (pp. 67–78). Warszawa: Wydawnictwo IFiS PAN.

[5] Cameron, P. (1969). Age parameters of young adult, middle-aged, old, and aged. *Journal of Gerontology*, 24(2). DOI:10.1093/geronj/24.2.201.

[6] Chopik, W.J. et al. (2018). Age differences in age perceptions and developmental transitions. *Frontiers in Psychology*, 9 (FEB), pp. 1–10. DOI:10.3389/fpsyg.2018.00067.

[7] Długosz, Z. (2011). Population ageing in Europe. *Procedia – Social and Behavioral Science*s, pp. 47–55, DOI:10.1016/j.sbspro.2011.05.106.
[8] Drevenstedt, J. (1976). Perceptions of onsets of young adulthood, middle age, and old age. *Journals of Gerontology*, 31(1), pp. 53–57. DOI:10.1093/geronj/31.1.53.
[9] Frackowiak, T. et al. (2020). Difference in perception of onset of old age in traditional (Hadza) and modern (Polish) societies. *International Journal of Environmental Research and Public Health*, 17(19). DOI: 10.3390/ijerph17197079.
[10] Hox, J.J. (2010). Multilevel analysis: *Techniques and applications. Second, Multilevel Analysis: Techniques and Applications*. New York and Hove: Routledge. DOI: 10.4324/9780203852279.
[11] Jurek, Ł. (2021). Macro-Level Predictors of Old-Age Threshold Perception: A Comparative Study Using ESS, Ipsos, and Eurobarometer Data. *European Research Studies Journal*, XXIV (4B), pp. 723–739.
[12] Jurek, Ł. (2022). Chronological Age and Subjective Perception of the Old-Age Threshold: An Empirical Verification of the Age-Group Dissociation Effect Using European Social Survey Data. *Advances in Gerontology*, 12(1), pp. 14–24.
[13] Kotter-Gruhn, D., Kornadt, A.E., & Stephan, Y. (2015). Looking beyond Chronological Age: Current Knowledge and Future Directions in the Study of Subjective Age. *Gerontology*, 62(1), pp. 86–93. DOI: 10.1159/000438671.
[14] Kuper, H. & Marmot, M. (2003). Intimations of mortality: Perceived age of leaving middle age as a predictor of future health outcomes within the Whitehall II study. *Age and Ageing*, 32(2), pp. 178–184. DOI: 10.1093/ageing/32.2.178.
[15] Lloyd, K. & Leslie, D.S. (2013). Context-dependent decision-making: A simple Bayesian model. *Journal of the Royal Society Interface*, 10(82). DOI:10.1098/rsif.2013.0069.
[16] Lutz, W., Sanderson, W., & Scherbov, S. (2008). The coming acceleration of global population ageing. *Nature*, 451(7179), pp. 716–719. DOI: 10.1038/nature06516.
[17] Meyers-Levy, J., Zhu, R., & Jiang, L. (2010). Context effects from bodily sensations: Examining bodily sensations induced by flooring and the moderating role of product viewing distance. *Journal of Consumer Research*, 37(1). DOI: 10.1086/649028.
[18] Nikolić, D. (2010). The brain is a context machine. *Review of Psychology*, 17(1).
[19] Peters, G.R. (1971). Self-conceptions of the aged, age identification, and aging. *Gerontologist*, 11(4). DOI: 10.1093/geront/11.4_Part_2.69.
[20] Shiovitz-Ezra, S. & Ayalon, L. (2010). Situational versus chronic loneliness as risk factors for all-cause mortality. *International Psychogeriatrics*, 22(3), pp. 455–462. DOI: 10.1017/S1041610209991426.
[21] Todorović, D. (2010). Context effects in visual perception and their explanations. *Review of Psychology*, 17(1), pp. 17–32, http://hrcak.srce.hr/70655?lang=en.
[22] Weiss, D. & Kornadt, A.E. (2018). Age-Stereotype Internalization and Dissociation: Contradictory Processes or Two Sides of the Same Coin? *Current Directions in Psychological Science*, 27(6), pp. 477–483. DOI: 10.1177/0963721418777743.

[23] Weiss, D. & Lang, F.R. (2012). "They" are old but "I" feel younger: Age-group dissociation as a self-protective strategy in old age. *Psychology and Aging*, 27(1), pp. 153–163. DOI: 10.1037/a0024887.

[24] Westerhof, G.J. & Wurm, S. (2015). Longitudinal research on subjective aging, health, and longevity: Current evidence and new directions for research. *Annual Review of Gerontology and Geriatrics*, pp. 145–165, DOI:10.1891/0198-8794.35.145.