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Influence of environmental factors on facial ageing

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Abstract

Background: a recent twin study has shown that 'looking old for one's age' is associated with increased mortality. Approximately 40% of the variation in perceived age is due to non-genetic factors.
Objective: to examine environmental factors influencing perceived age controlling for diseases.
Design: a twin study.
Setting: in the 2001 wave of the population-based survey—the Longitudinal Study of Aging Danish Twins—participants provided information on a wide range of exposures and health indicators. Additionally, they were asked to have a face photograph taken.
Subjects: a total of 1826 elderly (70+) twins who had a high-quality face photograph taken.
Methods: ten nurses assessed the visual age of each twin from the face photograph. The mean of the nurses' age estimates for each twin was used as the twin's perceived age. Multivariate linear regression and intrapair comparison (for intact twin pairs) were used for analyses.
Results: statistically significant determinants of facial ageing associated with high perceived age for men were smoking ($P = 0.01$), sun exposure ($P = 0.02$) and low body mass index (BMI) ($P<0.005$), while for women they were low BMI ($P = 0.05$) and low social class ($P<0.005$). The number of children (men) and marital status ($P = 0.08$) and depression symptomatology score (women) were borderline significantly associated with facial ageing.
Conclusion: our study confirms previous findings of a negative influence of sun exposure, smoking and a low BMI on facial ageing. Furthermore, our study indicates that high social status, low depression score and being married are associated with a younger look, but the strength of the associations varies between genders.

Keywords: *perceived age, facial ageing, twin study, elderly*

Background

It is generally agreed that certain individuals look 'old for their age' or 'young for their age'. In elderly individuals, 'looking old for one's age' has been considered an indicator of poor health, and a recent twin study showed that 'looking young for one's age' is in fact associated with prolonged survival [1]. The same study found that 40% of the variation in perceived age is due to non-genetic factors. In the present study, we wish to examine environmental causes influencing variation in perceived age.

One of the visual cues underlying the perception of facial ageing is skin wrinkling. A study demonstrated that the impression that people are older than their stated ages correlates with clinical and histologic evidence of wrinkling and solar elastosis [2]. Previous studies have pointed towards smoking [3–6] and sun exposure [7, 8] as environmental factors of major importance for premature skin wrinkling or facial ageing. Frequent intake of alcoholic beverages has also been shown to correlate with appearing older than chronological age [9], whereas a negative correlation between a higher body mass index (BMI) and wrinkles and between a better health and wrinkles has been found [10, 11]. Marital status has been shown not to influence perceived age [9].

Studies of same-sexed twins provide an opportunity for case–control studies that control for age, gender and genes (all in monozygotic twins and half in dizygotic twins). Previously, only one twin study based on 35 pairs has examined environmental factors influencing facial ageing [12]. Though inconclusive, the study does point at smoking and sun exposure as having a negative effect.

Here we use a population-based nationwide study of elderly Danish monozygotic and dizygotic twins to examine environmental causes influencing perceived age, controlling for diseases. Among individual data collected are health status, self-reported diseases, current use of analgesics, smoking, depression score, BMI, family social class, number of children and marital status. Our data do not include explicit

information on sun exposure but on the type of profession that indicates exposure to sun (i.e. during working hours).

Based on the previous literature, we would expect smoking and former/present diseases to be associated with looking older than chronological age. Contrarily, we would expect a higher BMI to be correlated with a younger appearance. In addition, our data include information on individual depression symptomatology score, use of analgesics, family social class and number of children, all factors that, to our knowledge, have never been investigated in relation to visual ageing before and that we hypothesise could be associated with perceived age.

Materials and methods

Survey population

Our study is based on the Longitudinal Study of Aging Danish Twins 2001 (LSADT 2001) [13]. LSADT is a longitudinal study that started in 1995, where Danish monozygotic and dizygotic twins [same sex for all studied cohorts but also opposite sex from the oldest cohort (<1920)] who are 70+ years of age are asked to give a health-related interview every second year. In LSADT 2001, a total of 2,448 twins participated, comprising 524 same-sexed pairs (229 monozygotic and 295 dizygotic) and 1,398 single twins. Of these, 1,948 (80%) were cognitively intact and consented to have their face photographed. A digital camera was used at a distance of 0.6 m, person en face, head held straight with a neutral background, if possible. In 1,826 twins (840 men and 986 women), we had a high-quality picture taken, providing a sample size sufficient for the proposed analysis. Not everyone was photographed with a neutral facial expression, but that has been shown not to have any impact on perceived age [9].

Perceived age

Ten female nurses, aged 25–46 years, were engaged to assess the visual age of each twin from the face photograph. The mean of the nurses' age estimates for each twin was used as the twins' perceived age. Using ANOVA, the reliability of the mean age rating was estimated to be 0.89, and $\alpha = 0.93$ using Cronbach's coefficient alpha.

Social class

The classification of a participant's social group employed the social group classification of the Danish National Institute of Social Research [14]: Group I having the highest social rank and Group V the lowest. The social group was taken as the highest of the participant and his or her spouse.

Sun exposure

The degree of sun exposure was based on information on type of job during the longest period of working life. The participants were assessed in two categories: whether they had worked indoor or (partly) outdoor.

Children

The number of biological children was categorised into three groups: 0 children, 1–3 children and 4+ children.

Marital status

Marital status at the time of interview was categorised into three groups: married, separated/widowed and never married.

Depression symptomatology score

The depression symptomatology score was developed by McGue and Christensen [13]. The scale used in this work was computed by summing 17 symptoms: 9 symptoms primarily dealing with well-being and 8 dealing with cognitive difficulties, slowing and loss of energy. The score range is 17–49: the higher the score the more depressed.

Other variables

Also, use of analgesic, smoking (converted to pack-years), alcohol consumption (ever had more than three drinks of alcohol per day for a longer period), various diseases [diabetes, asthma/chronic bronchitis, cancer (except skin cancer), stroke and cardiovascular diseases], BMI and change in BMI since the 1999 survey were included in the analyses.

Analyses of associations

All analyses were made separately for the two sexes. To detect possible associations between perceived age and the suspected phenotypes, bivariate linear regression analyses were carried out, with perceived age as the dependent variable and chronological age as well as the other variables as the independent variable. Stepwise forward inclusion and backward elimination were carried out on multiple linear regression using $P = 0.20$ for inclusion/exclusion of covariates. Also, within twin pairs, comparisons of intact twin pairs were made using sign and McNemar tests.

Results

Summary statistics stratified by sex are shown in Table 1.

It has been previously shown that the perceived age in this sample regressed towards a mean of 77 [1] (Figure 1). Therefore, chronological age was included in all regression models.

Regrouping of categorical variables

Regression on social class and number of children showed that we could combine some of the groups, since the estimates for the regression coefficients in bivariate regression with age were comparable for these groups. For men, social Groups II–V were combined, and for women, Groups I–III were combined. As for number of children, the groups with no children and many children (4+) were combined for men, while for women the groups consisting of no children and 1–3 children were combined.

Bivariate regression

The results of the bivariate regressions including age and one other covariate, one at a time for each sex, are summarised in Table 2. For men, the results show that chronological age, smoking, sun exposure, having none or many children (4+) and suffering from strokes or asthma/chronic bronchitis are associated with a higher perceived age, while having a higher BMI is associated with a decrease in perceived

Table 1. Summary statistics

	Men (n = 840)	Women (n = 986)	Total (n = 1826)
Age (year)			
Mean (SD)	77.0 (5.6)	78.4 (6.0)	77.7 (5.9)
Range	70.2–97.2	70.2–99.8	70.2–99.8
Perceived age (year)			
Mean (SD)	77.6 (3.8)	78.0 (4.6)	77.8 (4.2)
Range	66.4–88.1	63.4–90.3	63.4–90.3
Marital status [n (%)]			
Married	585 (69.6)	320 (32.5)	905 (49.6)
Separated/widowed	196 (23.3)	608 (61.7)	804 (44.0)
Never married	59 (7.0)	57 (5.8)	116 (6.4)
Missing	0 (0)	1 (0.1)	1 (0.1)
Smoking (pack-years[a])			
Per cent smokers	78.9	51.8	64.3
Mean (SD)	22.2 (23.4)	10.3 (16.7)	15.8 (20.9)
Range	0–184.5	0–140	0–184.5
Missing [n (%)]	14 (1.7)	16 (1.6)	30 (1.6)
Family social class [n (%)]			
I	25 (3.0)	31 (3.1)	56 (3.1)
II	78 (9.3)	106 (10.8)	184 (10.1)
III	147 (17.5)	173 (17.6)	320 (17.5)
IV	212 (25.2)	252 (25.6)	464 (25.4)
V	362 (43.1)	412 (41.8)	774 (42.4)
Missing	16 (1.9)	12 (1.2)	28 (1.5)
Sun exposure [n (%)]			
Indoor work	467 (55.6)	892 (90.5)	1,359 (74.4)
Partly outdoor work	341 (40.6)	82 (8.3)	423 (23.2)
Missing	32 (3.8)	12 (1.2)	44 (2.4)
Number of children [n (%)]			
0	107 (12.7)	141 (14.3)	248 (13.6)
1–3	554 (66.0)	630 (63.9)	1,184 (64.8)
4+	166 (19.8)	206 (20.9)	372 (20.4)
Missing	13 (1.6)	9 (0.9)	22 (1.2)
Depression symptomatology score			
Mean (SD)	20.8 (4.5)	21.4 (4.7)	21.1 (4.6)
Range	17–46	17–47	17–47
Missing [n (%)]	3 (0.4)	7 (0.7)	10 (0.6)
BMI			
Mean (SD)	25.4 (3.2)	24.2 (4.1)	24.8 (3.8)
Range	15.4–39.3	15.2–42.6	15.2–42.6
Missing [n (%)]	2 (0.2)	13 (1.3)	15 (0.8)
BMI change since 1999 [n (%)]			
>5% BMI gain	70 (8.3)	103 (10.5)	173 (9.5)
≤5% BMI change	468 (55.7)	531 (53.9)	999 (54.7)
>5% BMI loss	94 (11.2)	165 (16.7)	259 (14.2)
Missing	208 (24.8)	187 (19.0)	395 (21.6)
Analgesics [n (%)]			
No use of analgesics	689 (82.0)	710 (72.0)	1,399 (76.6)
Uses analgesics	107 (12.7)	232 (23.5)	339 (18.6)
Missing	44 (5.2)	44 (4.5)	88 (4.8)
Suffering from [n (%)]			
Diabetes	91 (10.8)	77 (7.8)	168 (9.2)
Asthma/bronchitis	141 (16.8)	131 (13.3)	272 (14.9)
Cancer (not skin cancer)	47 (5.6)	100 (10.2)	147 (8.1)
Stroke	96 (11.4)	46 (4.7)	142 (7.8)
Cardiovascular diseases	187 (22.3)	183 (18.6)	370 (20.3)

[a]1 pack-year = 7,305 cigarettes.

age. Also, higher depression symptomatology score, lower social class and not being married have a tendency to increase the perceived age.

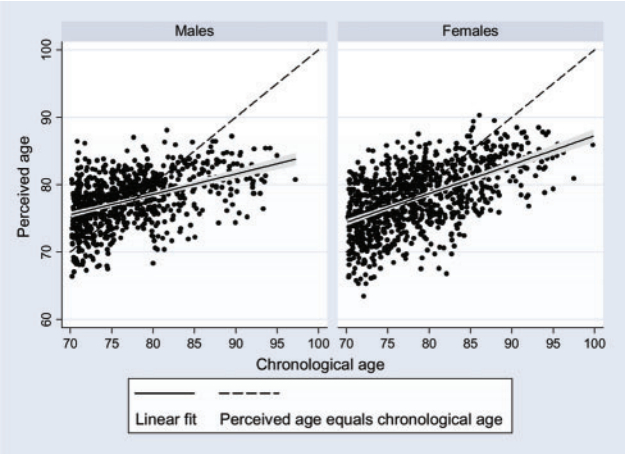

Figure 1. Relation between perceived age and chronological age.

For women, chronological age, smoking, lower social class, higher depression symptomatology score and suffering from cardiovascular diseases increase perceived age, and there is a tendency for alcohol, sun exposure and suffering from asthma/chronic bronchitis to also do so. On the other hand, there is a slight tendency for a high BMI or being married to be associated with a younger look.

Overall, the results for men and women are very similar, with a few exceptions. For both sexes, the effect of chronological age on perceived age stayed consistently at the same levels: for men, at a level of ~0.3, meaning that in this age group (70+) it takes ~3 years for men to visually age 1 year, while the effect for women in the same age group is slightly larger, namely ~0.4, meaning that women visually age 1 year per 2.5 years, reflecting the regression towards the mean previously noticed [1].

Multivariate regression

Stepwise regression on all variables (forward substitution and backward elimination—using $P = 0.20$ for both inclusion and exclusion gave the same results) resulted in models as summarised in Table 2.

For men, the effect of chronological age ($P<0.005$), smoking ($P = 0.01$), sun exposure ($P = 0.02$), lower BMI ($P<0.005$) and suffering from stroke ($P = 0.03$) increase the perceived age significantly, while the effects of having one to three children compared with none or more than three ($P = 0.08$) have a tendency to decrease the perceived age. Lower social class ($P = 0.08$) and suffering from asthma/chronic bronchitis ($P = 0.11$) have a tendency to increase the perceived age.

For women, the effect of chronological age ($P<0.005$), lower social class ($P<0.005$) and suffering from cardiovascular diseases increase the perceived age significantly, while being married ($P = 0.04$) tends to decrease the perceived age. There is a tendency that also lower BMI ($P = 0.09$) and higher depression symptomatology score ($P = 0.10$) have an increasing effect on the perceived age.

Table 2. Regressions

	Bivariate regressions for men including chronological age and one other covariate one at a time			
Covariates	Age	*P*-value for age	Covariate	*P*-value for covariate
Pack-years/10[a]	0.30 [0.26; 0.35]	0.00	0.14 [0.04; 0.24]	0.01
Alcohol[b]	0.30 [0.26; 0.34]	0.00	0.09 [−0.66; 0.85]	0.81
Sun exposure[c]	0.29 [0.25; 0.33]	0.00	0.51 [0.04; 0.98]	0.03
BMI	0.30 [0.26; 0.34]	0.00	−0.12 [−0.20; −0.05]	0.00
BMI change[d]	0.27 [0.22; 0.32]	0.00	0.27 [−0.22; 0.77]	0.28
Social class[e]	0.30 [0.26; 0.34]	0.00	1.26 [−0.08; 2.61]	0.06
Marital status[f]	0.30 [0.26; 0.34]	0.00	−0.30 [−0.67; 0.08]	0.12
Children[g]	0.30 [0.26; 0.34]	0.00	0.59 [0.11; 1.08]	0.02
Use of analgesics[h]	0.30 [0.26; 0.34]	0.00	0.09 [−0.59; 0.78]	0.79
Depression score	0.30 [0.26; 0.34]	0.00	0.05 [0.00; 0.10]	0.06
Diabetes[i]	0.30 [0.26; 0.34]	0.00	−0.46 [−1.19; 0.27]	0.22
Asthma/bronchitis[i]	0.30 [0.26; 0.34]	0.00	0.61 [0.01; 1.22]	0.05
Cancer (not skin)[i]	0.30 [0.26; 0.34]	0.00	0.03 [−0.96; 1.02]	0.96
Stroke[i]	0.30 [0.26; 0.34]	0.00	0.88 [0.17; 1.59]	0.02
Cardiovascular[i]	0.30 [0.26; 0.34]	0.00	0.09 [−0.45; 0.64]	0.74
	Bivariate regressions for women including chronological age and one other covariate one at a time			
Covariates	Age	*P*-value for age	Covariate	*P*-value for covariate
Pack-years/10[a]	0.45 [0.40; 0.49]	0.00	0.18 [0.03; 0.33]	0.02
Alcohol[b]	0.42 [0.38; 0.46]	0.00	1.29 [−0.45; 3.03]	0.15
Sun exposure[c]	0.42 [0.38; 0.46]	0.00	0.81 [−0.06; 1.68]	0.07
BMI	0.43 [0.38; 0.47]	0.00	−0.05 [−0.11; 0.01]	0.10
BMI change[d]	0.41 [0.37; 0.46]	0.00	0.05 [−0.41; 0.51]	0.82
Social class[e]	0.44 [0.40; 0.48]	0.00	0.83 [0.55; 1.10]	0.00
Marital status[f]	0.42 [0.38; 0.46]	0.00	−0.32 [−0.76; 0.12]	0.15
Children[g]	0.43 [0.39; 0.47]	0.00	0.40 [−0.19; 0.99]	0.18
Use of analgesics[h]	0.42 [0.38; 0.46]	0.00	0.21 [−0.36; 0.78]	0.48
Depression score	0.42 [0.38; 0.46]	0.00	0.07 [0.02; 0.12]	0.01
Diabetes[i]	0.43 [0.39; 0.47]	0.00	−0.04 [−0.93; 0.85]	0.94
Asthma/bronchitis[i]	0.43 [0.39; 0.47]	0.00	0.59 [−0.12; 1.29]	0.10
Cancer (not skin)[i]	0.43 [0.39; 0.47]	0.00	−0.57 [−1.36; 0.22]	0.16
Stroke[i]	0.43 [0.39; 0.47]	0.00	−0.35 [−1.48; 0.79]	0.55
Cardiovascular[i]	0.42 [0.38; 0.46]	0.00	1.05 [0.44; 1.66]	0.00
	Result of stepwise regression on all variables for men and women separately			
	Men		Women	
	Regression coefficient	*P*-value	Regression coefficient	*P*-value
Age	0.29 [0.24; 0.33]	0.00	0.41 [0.37; 0.45]	0.00
Pack-years/10[a]	0.15 [0.04; 0.26]	0.01	—	—
Sun exposure[c]	0.63 [0.12; 1.13]	0.02	—	—
BMI	−0.14 [−0.22; −0.06]	0.00	−0.06 [−0.12; 0.00]	0.04
Social class[e]	1.23 [−0.17; 2.63]	0.09	0.91 [0.63; 1.20]	0.00
Marital status[f]	—	—	−0.44 [−0.88; 0.01]	0.06
Children[g]	0.45 [−0.07; 0.97]	0.09	—	—
Depression score	—	—	0.05 [0.00; 0.10]	0.07
Asthma/bronchitis[i]	0.56 [−0.08; 1.19]	0.09	—	—
Stroke[i]	0.93 [0.20; 1.67]	0.01	—	—
Cardiovascular[i]	—	—	1.04 [0.42; 1.66]	0.00
	Multivariate regression of all variables selected by the stepwise analysis for men and/or women			
	Men		Women	
	Regression coefficient	*P*-value	Regression coefficient	*P*-value
Age	0.28 [0.24; 0.33]	0.00	0.42 [0.38; 0.47]	0.00
Pack-years/10[a]	0.14 [0.04; 0.25]	0.01	0.11 [−0.05; 0.27]	0.18
Sun exposure[c]	0.59 [0.09; 1.08]	0.02	0.52 [−0.35; 1.40]	0.24

Table 2. *continued*

	Multivariate regression of all variables selected by the stepwise analysis for men and/or women			
	Men		Women	
	Regression coefficient	*P*-value	Regression coefficient	*P*-value
BMI	−0.15 [−0.22; −0.07]	0.00	−0.06 [−0.12; 0.00]	0.05
Social class[e]	0.99 [−0.35; 2.34]	0.15	0.84 [0.55; 1.13]	0.00
Marital status[f]	−0.14 [−0.54; 0.27]	0.51	−0.39 [−0.83; 0.05]	0.08
Children[g]	0.45 [−0.07; 0.97]	0.09	0.25 [−0.34; 0.84]	0.40
Depression score	0.02 [−0.03; 0.08]	0.44	0.05 [0.00; 0.11]	0.07
Asthma/bronchitis[i]	0.53 [−0.09; 1.16]	0.10	0.16 [−0.54; 0.87]	0.65
Stroke[i]	0.92 [0.17; 1.68]	0.02	−0.30 [−1.46; 0.86]	0.61
Cardiovascular[i]	−0.11 [−0.68; 0.46]	0.71	0.96 [0.34; 1.58]	0.00

All *P*-values <0.005 are truncated at 0.

[a]1 pack-year = 7,305 cigarettes.

[b]1, if ever did drink more than three beverages of alcohol per day for a longer period; 0, otherwise.

[c]Indoor work coded as 0, outdoor as 1.

[d]More than 5% body mass index (BMI) gain compared to 2 years ago coded as –1, less than 5% BMI change compared to 2 years ago coded as 0, more than 5% BMI loss compared to 2 years ago coded as 1.

[e]Men: social Groups II–V combined; women: social Groups I–III combined.

[f]Never married coded as 0, separated or widowed coded as 1, married coded as 2.

[g]Men: 0 and 4+ children combined coded as 1, 1–3 children coded as 0; women: 0–3 children coded as 0, 4+ children coded as 1.

[h]No use of analgesics coded as 0, use of analgesics coded as 1.

[i]Coded as 1 if subject suffers or did suffer from disease; 0 if not.

For both sexes, there is no significant effect of alcohol consumption, which may be due to a lack of statistical power as the proportion reporting a substantial alcohol consumption for a longer period was small (men 10%, women 2%).

Table 2 summarises the results of a multivariate regression on variables selected for either men or women in the stepwise selection algorithm. All the regression coefficients are comparable to the results of the reduced models attained by stepwise regressions, but, more interestingly, it shows that practically all environmental factors influence the perceived ages in men and in women in the same direction.

Intrapair comparison

Sign and McNemar tests on intact twin pairs showed the same tendencies as regression, but due to the smaller number of intact pairs only significant effects from smoking (men: $P = 0.05$; women: $P = 0.10$) and marital status (men: $P = 0.08$; women: $P = 0.07$) were found.

Discussion

This study, aimed at investigating environmental causes influencing variation in perceived age, confirms our hypotheses to a large extent. Our main results show that sun exposure and smoking are associated with an increase in perceived age, whereas a high BMI, high social class, low depression score and being married are associated with a younger look, but the strength of the statistical association differs in men and women. Furthermore, having one to three children seems to have a favourable influence on perceived age in men.

Smoking [3, 4] and sun exposure [7, 8] have been shown to be associated with premature skin wrinkling or facial ageing. We found that sun exposure was highly significant for increasing perceived age in men, but not in women. This could most likely be explained by the fact that our data on sun exposure stem from profession data. Men exposed to sun during working hours have been highly exposed, e.g. fishermen and farmers, whereas only a very small number of women had been exposed to sun during working hours (8.3%). Our data on female sun exposure should thus be interpreted cautiously.

Similar tendency is seen in relation to smoking. Our data show that smoking is significantly associated with an increase in perceived age in men: smoking 20 cigarettes per day for ~20 years has the same effect on perceived age as ageing 1 year. The effect on women's perceived age is not quite as dramatic; here, the facial ageing caused by smoking 20 cigarettes per day for ~40 years compares to ageing 1 year. However, in this study, fewer women were smokers and women smoked less than men, which may also explain why the effect of smoking is not statistically significant for women.

The effect of high BMI, high social class and low depression score, though not all significant, was, for both sexes, associated with looking younger than one's age. A decrease of 2 BMI units for men and 7 BMI units for women has the same effect on perceived age as being 1 year older, shifting social class from highest to lowest compares to 3.5–4 years' difference in chronological age, while the effect of a change of depression symptomatology score from 17 to 49 is the same as ageing 2.4 years for men and 3.9 years for women. Marital status does not have a statistically significant effect on the perceived age for either men or women, but the tendency is that marriage decreases the perceived age more for women than for men. For men, the

effect of being married compared with never married compares to a 1-year decrease in perceived age; for women, 1.9 years. Apart from BMI, these factors have never been investigated in connection with perceived age; however, it makes sense that they would have an influence as they can all be seen as contributors to living the 'good' and affluent life. Less worrying, economic stability and social security are likely to be cue factors here.

Our analyses show that a high BMI makes men and women 70+ of age look younger. This corresponds well to the fact that BMI has been proven to be inversely related to degree of wrinkling [10] as well as to the fact that illness often is associated with loss of weight. Not surprisingly, asthma/chronic bronchitis, stroke (in men) and cardiovascular diseases (in women) are associated with looking older, most often with smoking as the underlying cause.

Interestingly, the number of children seems to influence men's perceived age more than women's. Having one to three children makes men look younger but has no influence on women's perceived age. We had no specific expectations concerning this issue.

Except for stroke (in women) and cardiovascular diseases (in men), all the covariates have the expected effects on the perceived age. For stroke, this might be due to the small number (males, 11.4%; females, 4.7%). But it is worth noting that for the significant effects of these two diseases (stroke in men and cardiovascular diseases in women), the effects are in the expected directions: diseases are associated with higher perceived age.

Our study has a number of strengths. It is population based, with a high participation rate. Furthermore, the fact that the photographs were taken as part of a survey, where the interviewers were visiting the participants in their homes, ensured the inclusion of the more frail participants also, whereas this is usually not the case when participants have to attend a clinical survey located at a research institution.

The weakness of our study is primarily that the photographs could not be taken as standardised as in a clinical setting due to various conditions in the participants' residences. However, the high Cronbach's alpha value (0.93) shows that the mean age rating (perceived age) is very reliable. Furthermore, a possible underreporting of smoking and alcohol consumption leads to an underestimation of the effects of these factors. Also, our data on sun exposure are based on type of job only and hence do not express cumulative sun exposure, but it is reassuring that we were able to confirm the previous established association between facial ageing and our measure of sun exposure. Moreover, we have not considered the duration of certain diseases and conditions.

All in all, it could be argued that, though statistically significant, the influence of the present investigated environmental factors on facial ageing seems sparse. However, again it must be considered that perceived age in elderly persons (70+) tends to regress towards a mean of 77 [1], and therefore, any influence could be expected to be modest, e.g. it takes 2.5 and 3 years for women and men, respectively, to increase perceived year by 1 year. It is likely that the influence of the same environmental factors on perceived age is larger in younger generations.

Key points

- The present study of 1,826 twins aged 70+ confirms an influence of sun exposure, smoking and BMI on facial ageing.
- The study also indicates that high social status, low depression score and being married are associated with a younger look.
- The strength of the associations varies between genders.

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Conflicts of interest

There are no conflicts of interest.

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