

Direct assessment of the effect of age on P.T.C. sensitivity

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Harris & Kalmus (1949) determined the taste-sensitivity for P.T.C. (phenyl-thiocarbamide, phenyl-thiourea) in a sample of 441 healthy men of varying ages, using a series of solutions in which each contained half the concentration of the previous one, no. 1 being 1.3 g. P.T.C./l. Thresholds were expressed as the numbers of dilution steps plus 1, that is in log. units to the base 2. The regression of threshold on age was calculated: for each year of age sensitivity appeared to decline by a mean of 0.0577 ± 0.0060 such steps. This decline with age was taken to be a real one, but it could also have occurred as an artifact due to heterogeneity of the population studied. Direct observation of the same individuals over a period of years would avoid this possible fallacy and establish the effect of age more securely.

In the present paper, we describe the results of measuring the threshold changes of 110 individuals after a lapse of between 10 and 15 years (13.20 years on the average). Using the method described in 1949, thirty-four healthy men and twenty-six healthy women were retested by H. K. in ignorance of their original thresholds; six goitrous men and forty-four goitrous women, all under treatment or supervision, and originally tested by Harris, Kalmus & Trotter (1949), were retested by the same method, also in ignorance of the previous results. The outcome of these tests is presented in Table 1 and Fig. 1. Among the 110 pairs of individual thresholds 27 were the same, 61 show an increase and 22 a decrease. The instances of threshold decrease do

Table 1. *Change of P.T.C. thresholds of 110 people retested after 10–15 years (av. 13.19 years)*

Number	Original threshold (10–15 years ago)	Threshold now	Age at second test
Non-goitrous women			
1	13	11	38
2	10	9	50
3	4	1	49
4	7	7	50
5	0	0	72
6	0	0	41
7	10	10	35
8	10	10	65
9	3	0	52
10	10	7	67
11	11	10	47
12	10	10	50
13	9	10	41
14	5	4	42
15	3	1	36
16	2	1	57
17	9	10	44
18	10	9	48

Table 1 (*continued*)

Number	Original threshold (10-15 years ago)	Threshold now	Age at second test
Non-goitrous women (<i>cont.</i>)			
19	3	2	57
20	4	5	36
21	4	1	40
22	10	8	60
23	10	9	39
24	6	6	61
25	9	7	64
26	3	1	38
Non-goitrous men			
27	8	8	55
28	9	9	38
29	10	11	36
30	10	9	48
31	12	11	59
32	11	10	56
33	11	9	52
34	9	8	33
35	9	8	37
36	1	2	43
37	1	0	41
38	3	3	36
39	1	2	41
40	9	9	55
41	10	10	44
42	10	9	60
43	2	1	51
44	2	2	54
45	7	8	55
46	10	9	65
47	1	1	57
48	8	10	51
49	9	8	34
50	7	6	63
51	10	10	50
52	2	2	64
53	9	8	53
54	7	8	43
55	2	1	57
56	10	8	48
57	9	8	40
58	10	8	53
59	9	1	38
60	1	8	64
Goitrous women			
61	4	1	66
62	0	0	72
63	1	2	65
64	1	1	75
65	1	0	34
66	1	0	51
67	1	0	75
68	2	0	68
69	1	1	46

Table 1 (*continued*)

Number	Original threshold (10-15 years ago)	Threshold now	Age at second test
Goitrous women (<i>cont.</i>)			
70	1	0	61
71	1	0	52
72	1	0	59
73	2	0	58
74	2	0	74
75	3	6	42
76	3	4	51
77	3	0	56
78	4	0	38
79	7	9	44
80	8	8	51
81	8	9	58
82	8	6	53
83	8	10	36
84	8	8	41
85	8	9	35
86	9	8	64
87	9	9	68
88	9	10	58
89	10	9	63
90	10	9	40
91	10	8	51
92	10	10	56
93	10	9	51
94	10	10	59
95	10	10	61
96	10	10	42
97	10	9	61
98	10	8	46
99	10	9	67
100	11	9	57
101	11	8	57
102	11	10	50
103	11	10	60
104	11	10	69
Goitrous men			
105	10	8	47
106	9	9	41
107	9	10	48
108	7	9	46
109	6	8	55
110	1	0	64

not presumably indicate real improvement of sensitivity but are a consequence of the inaccuracy of the method. Two men (nos. 59 and 60) apparently changed their taster status (one from threshold 9 to 1 and the other from 1 to 8) but we cannot be sure of the correctness of the first measurements. The mean threshold deterioration in the whole sample was 0.6182 ± 0.1559 units, equivalent to a mean annual deterioration of 0.0468 ± 0.0118 units which is not significantly less than estimated. This corresponds to an annual increase in threshold concentration of about 3% on the previous year.

This overall long-term deterioration may be contrasted with the overall short-term

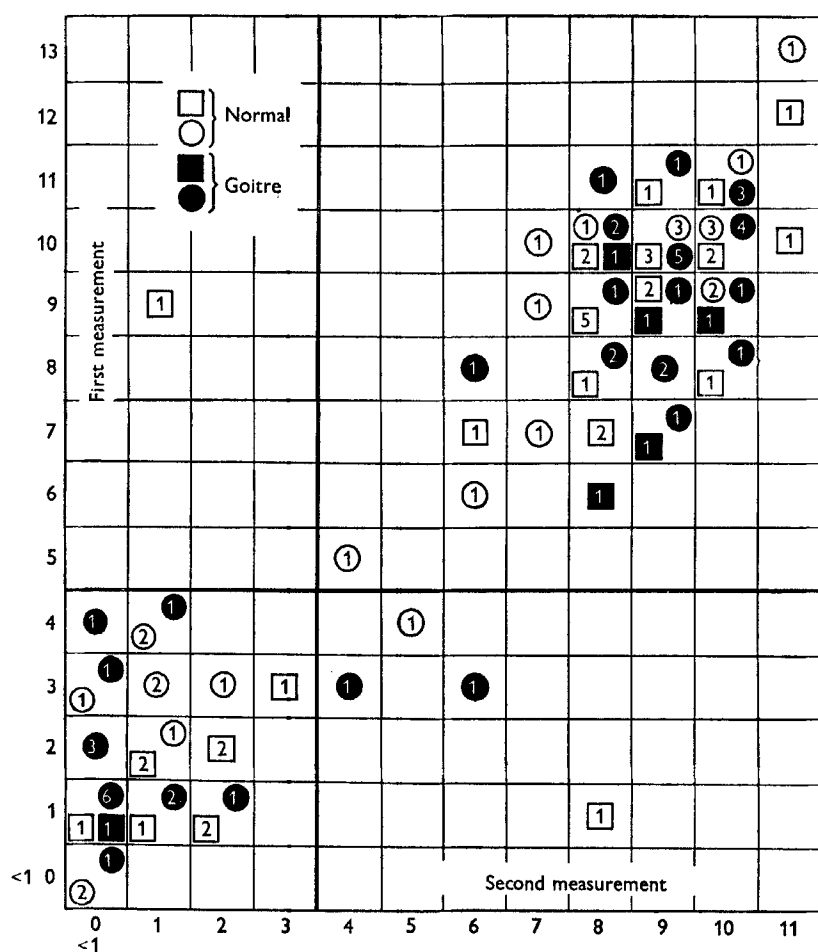


Fig. 1. Taste thresholds for phenylthiocarbamide (P.T.C.) of 108 people retested after 10-15 years (mean 13.19 years). Solution no. 1 contains 1.3 g. of P.T.C./l., no. 2 half this amount, etc.

Table 2. Differences in the deterioration of P.T.C.-sensitivity after 10-15 years, according to sex, age, thyroid condition and taster status

Compared groups and numbers	Annual mean threshold deterioration	Significance of difference (P)
	Dilution steps	
Non-goitrous women (26)	0.0758	0.012
Non-goitrous men (34)	0.0312	
First tested at age 47 and below (71)	0.0462	0.87
First tested at age 48 and above (39)	0.0487	
Non-goitrous women (26)	0.0758	0.09
Goitrous women (44)	0.0516	
Tasters (81)	0.448	0.69
Non-tasters (29)	0.0505	

improvement of P.T.C. thresholds observed in retests after a few days or weeks (Harris & Kalmus, 1949) which can be presumed to be a consequence of learning. Of forty-nine individuals thus retested, twenty-nine showed no change, eighteen improved and two deteriorated.

The rate of decline in sensitivity depends on sex—women, who are usually somewhat more sensitive than men, deteriorate more rapidly—but not on age, thyroid condition or taster status (Table 2). None of the measurements in this paper as yet warrants an alteration of the corrections proposed in respect of sex and age when determining the taster status (Kalmus, 1958).

SUMMARY

Individual P.T.C. sensitivity of adult people declines on the average by 0.0468 ± 0.0118 threshold units (log. to the base 2 of concentration) annually; this corresponds to a mean annual increase in threshold concentration of about 3 %. The deterioration is probably more rapid in women than in men, but age, thyroid condition and taster status do not affect its rate.

We are grateful to Miss S. Devereaux for repetition of the taste threshold measurements in thyroid patients, and to the Medical Research Council for a grant to one of us (W.R.T.).

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