



Odour-age associations: a pilot study of the Austrian Sensory Network

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Aim

There exists a vast scientific literature about associations of odours with various sensory perceptions like colour, taste, sound but also with emotions and feelings. However, when it comes to associations of odours with age groups no research can be found to our knowledge. This is despite the fact that also the flavours of many food products are designed for specific age groups. Therefore we hypothesised, that consumers are able to assign flavours to certain age groups.

Method & Material

To test this hypothesis we exposed 397 naive consumers to seven odours using smell strips and asked for their assignments to age groups, the liking of the odours and the familiarity with the odours. Consumers came from four different age groups (76 kids 3-10, 103 adolescents 11-20, 163 adults 21-65, 55 seniors 66+ years) and the seven different odours were: 'fruity citrus' (lemon oil), 'vanilla' (vanillin), 'floral' (linalool), 'spicy' (eugenol), 'confectionary' (isoamyl acetate), 'green' ((E,Z)-Nona-2,6-dienal) and 'nutty' (2-methoxy-3-methyl pyrazine). These seven odors have been chosen for several reasons: 1) to cover a variety of different flavour directions 2) they should cover associations throughout all age groups (based on preliminary studies) 3) the odors should be commonly known flavours or impact compounds. The number of odors was limited to seven not to overburden the untrained, naive participants. After sniffing the smell strips test persons were asked to answer questions on a questionnaire, which consisted of two parts. One part referred to the assignment: "Which age group comes first into your mind, when you smell this flavour? Choose one." (kids, adolescents, adults, seniors). And the other part asked for the liking and the familiarity of the odors. "I like the odor.", and "I know the odor." (Yes/No), followed by a request to describe the odor. The two parts were randomized. Here we only present the data of associative assignment and hedonic liking.

Results & Discussion

- Results of the total of 397 participants and of each age group are summarised in Table 1 to 5. Six out of seven odours were significantly assigned to an age group by the total of participants. These assignments are largely consistent throughout the single age groups of participants, although kids seem to be less discriminant than the other groups and the odor *fruity citrus* seems to be assigned differently by age groups.
- Confectionary and *vanilla* aroma was assigned to the kids group by majorities of 48 and 42%; *floral* and *spicy brown* to the adults group by majorities of 40 and 39%; and *green* and *nutty* by majorities of 44 and 53%. No odour was clearly assigned to the adolescent group. These percentages are significantly higher than the expected 25% by random. Only *fruity citrus* aroma was not clearly assigned to one of the four age groups by the total of participants. Only the group of adults clearly assigned it to the adolescent group (37%) (Tab.4) and adolescents to the kids group (36%) (Tab.3).
- The data reveal also a small gender effect. Female test persons assigned the *floral* odor more often to their own age group (50%) compared to the male group (34%). Women also tended to assign *vanilla* odor to kids more often (45%) than men (32%), and men assign *vanilla* more often to adolescents (30%) than women (19%) (Tab.4a and 4b).
- We also found a significant relation between liking and assignment. Odors with low liking scores are significantly more often assigned to the senior age group and odors with high liking scores are assigned to kids (Fig.1).
- An interesting, however not significant observation is, that seniors assign *fruity citrus* to adults and adolescents by the majority, adults to adolescents and adolescents to the kids, each age group to the younger group respectively. Only kids assign *fruity citrus* to their own group by the majority.

Tab.1: Assignments of seven odors to four age groups by all participants

	Confectionary	Floral	Fruity Citrus	Green	Nutty	Spicy Brown	Vanilla
Kids in %	48	13	27	9	9	19	42
Adolescents in %	23	19	31	10	11	17	27
Adults in %	17	40	27	37	27	39	22
Seniors in %	12	28	15	44	53	25	9
Liking of odor	73	65	85	40	19	78	87
Identification in %	74	59	88	61	45	82	80

n=397
% females = 56.4
Mean age = 30.5 years

Tab.2: Assignments of seven odors to four age groups by the kids group

	Confectionary	Floral	Fruity Citrus	Green	Nutty	Spicy Brown	Vanilla
Kids in %	38	21	36	18	14	29	46
Adolescents in %	20	22	24	14	11	25	25
Adults in %	24	33	25	29	20	29	16
Seniors in %	18	24	16	38	55	17	13
Liking of odor	83	71	96	55	28	78	92
Identification in %	62	51	76	54	43	80	75

n=76
% females = 48.7
Mean age = 8.6 years

Tab.3: Assignments of seven odors to four age groups by the adolescents group

	Confectionary	Floral	Fruity Citrus	Green	Nutty	Spicy Brown	Vanilla
Kids in %	56	8.7	34	10	9	29	40
Adolescents in %	19	15	26	8	13	17	39
Adults in %	14	38	23	36	30	36	16
Seniors in %	11	39	17	47	49	17	6
Liking of odors	70	58	77	32	8	83	88
Identification in %	79	56	86	68	40	84	80

n=103
% females = 43.7
Mean age = 14.2 years

Tab.4: Assignments of seven odors to four age groups by the adults group

	Confectionary	Floral	Fruity Citrus	Green	Nutty	Spicy Brown	Vanilla
Kids in %	53	11	22	5	6	9	41
Adolescents in %	24	18	37	7	8	7	23
Adults in %	14	45	29	39	30	47	27
Seniors in %	9	26	12	48	56	37	9
Liking of odor	67	65	85	38	18	75	83
Identification in %	83	69	93	64	46	85	85

n=163
% females = 67.5
Mean age = 36.0 years

Tab.4a: Assignments of seven odors to four age groups by the male adults group

	Confectionary	Floral	Fruity Citrus	Green	Nutty	Spicy Brown	Vanilla
Kids in %	51	15	25	8	6	9	32
Adolescents in %	23	23	42	2	2	9	30
Adults in %	19	34	26	34	40	49	28
Seniors in %	8	28	8	57	53	32	9
Liking of odor	72	60	87	34	23	64	79
Identification in %	79	64	94	57	51	79	83

n=53
% females = 0.0
Mean age = 39.9 years

Tab.4b: Assignments of seven odors to four age groups by the female adults group

	Confectionary	Floral	Fruity Citrus	Green	Nutty	Spicy Brown	Vanilla
Kids in %	54	9.09	21	4	6	9	45
Adolescents in %	25	16.4	35	10	11	5	19
Adults in %	12	50	31	42	25	45	28
Seniors in %	10	24.5	14	45	57	40	9
Preference in %	65	67.3	84	40	15	80	85
Identification in %	85	71.8	93	67	44	87	86

n=110
% females = 100.0
Mean age = 34.1 years

Tab.5: Assignments of seven odors to four age groups by the seniors group

	Confectionary	Floral	Fruity Citrus	Green	Nutty	Spicy Brown	Vanilla
Kids in %	33	16	16	9	7	13	40
Adolescents in %	33	22	31	15	16	33	24
Adults in %	24	42	33	45	25	38	25
Seniors in %	11	20	20	31	51	16	11
Liking of odor	80	69	85	42	35	82	91
Identification in %	56	45	73	49	51	69	69

n=55
% females = 56.4
Mean age = 75.2 years

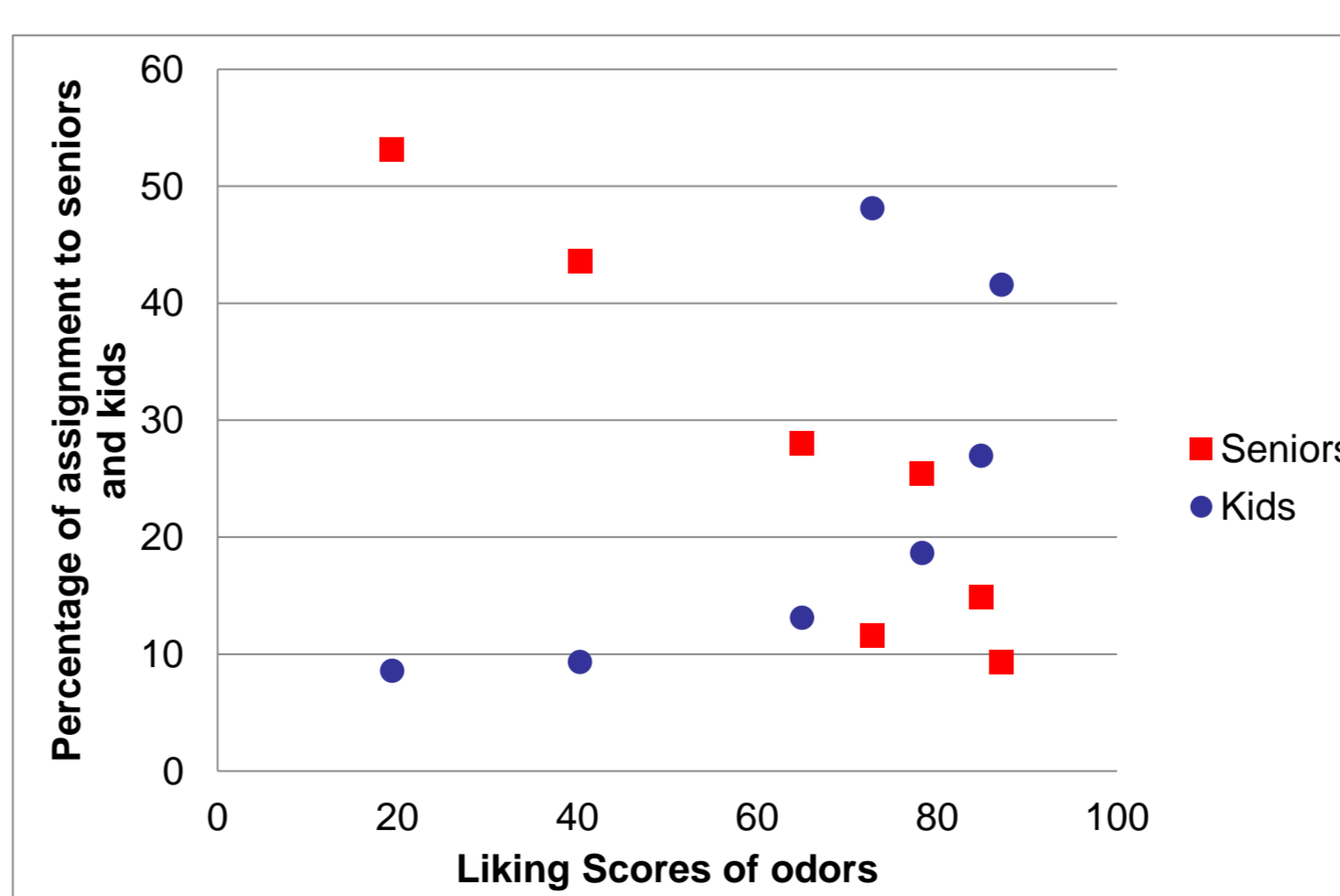


Fig. 1: Relations between liking scores of seven odors and the percentage of their assignment to the seniors and kids group

Conclusion & Outlook

This explorative pilot study implies that associative assignments of odors to age groups exist. However, it has to be shown in future research that the observed associations are stable over larger samples from one population and several other odors should also be tested, since in this pilot study only seven odors were used. Crosscultural effects may also be expected and explored in a larger test design.