Supplementary methods

Auditory stimuli

We used piano tones in the range of 264-528 Hz. The duration of each tone was 1 second and the tones were presented consecutively. Lower tones always preceded the higher ones. With these tone sequences 4 different intervals were designed (minor second, major second, minor third, and major third). In total 64 tone intervals were randomly presented 6 times (2 times no taste and 4 times taste conditions). Reaction time was measured as the interval from the end of tone two to the start of the button press.

Indirect Stroop test

In principle, two different strategies can be used to assess synesthesia with adapted Stroop-tasks: 1) manipulation of the inducer and registration of significant changes in the threshold or other perceptual aspects of the concurrent modality (here taste); 2) manipulation of the concurrent modality and registration of changes in perceptual aspects of the inducer. Although method 1 is the classical method for testing synesthesia, the second (indirect) method was applied for the following reasons:

1. Eminent researchers in the field of taste perception are aware of the fact that taste perception threshold measurements are associated with fundamental problems at least in the context of single subject measurements (Matlin M.W. & Foley H.J., Sensation and Perception, Allyn & Bacon, Boston, 1997, pp. 425-442). These measurements and the associated thresholds are intra- and inter-individually highly variable. These variabilities are due to many aspects including the application method, time of day, menstruation phase (ES is female), activation, and several cognitive factors.
2. The most problematic part of taste perception is that cognitive factors substantially influence taste perception measurements. A typical example is that particular chemical substances evoke different taste perceptions in relation to associated visual stimuli (e.g., artificial strawberry tastes in brown carrier substances evoke the perception of tasting vanilla whereas the same strawberry taste in a pink carrier evokes the perception of strawberry tastes).
3. A third problematic point is that taste threshold measurements are extremely time consuming based on the fact that repeated exposure to different tastes demands sufficient pauses between taste applications to neutralize taste perception and allowing taste receptors to return to baseline activity.
4. In addition, we suspect that using method 1 would not disprove the conceptual-priming explanation (which would be the alternative explanation for our findings). If conceptual-priming were the explanation, hearing a particular tone interval would evoke the association of a particular taste concept. Thus, this concept would influence taste perception thresholds.
5. A further issue worth mentioning is that by applying method 1, attention is strongly focussed on taste perception (dependent variable), whereas in the reported Stroop experiment, attention is focused on tone intervals (inducer) and not on taste perception. This focus on taste perception makes conceptual priming even more likely.
6. At least one important paper about synesthesia has used a very similar strategy (Smilek et al., 2001, J Cog Neurosc, 13, 930-936). These authors are using the same arguments and experimental design as we do. They demonstrated that the perception of the inducing stimuli (digit perception) is influenced by the concurrent perception (colour perception).