It contains values of B and V_0 for scores of liquids, all determined from straight-line plots, with many illustrations of the physical meaning of these constants.

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Rats Drink Less Cool Water: A Change in the Taste of Water?

Kapatos and Gold (*1*) have reported data of great importance for water intake—rats consumed less water when the water was cooled. These investigators state that some species, including man and rat, "lack water-sensitive taste receptors" so that the decrement in consumption of cool water in their study would necessarily have been mediated by nontaste, perhaps thermal, receptors. However, water does produce taste responses in man and rat under some conditions (*2, 3*). In addition, many fibers sensitive to taste are also sensitive to temperature (*4*). In the rat, most of these fibers sensitive to taste and temperature are responsive to cooling (*5*). This suggests that taste information might have helped to mediate the behavior observed by Kapatos and Gold, that is, cooling the water may have changed its taste.

The early failures to find responses to water in the rat chorda tympani taste nerve (*6*) apparently resulted because adaptation was not recognized as an important variable. Responses to water in the rat, as well as in other species, depend on the preceding adaptation state of the tongue (*3, 7*); that is, responses occur to water following NaCl or water following acid rather than to water per se. The taste of water has also been shown to be dependent on the adapting solution in man (*2*). Water following NaCl tastes bitter-sour, water following acid tastes sweet, and so forth.

In behavioral experiments the rat's tongue is adapted to saliva with a sodium content equivalent to 0.005 to 0.01*M* NaCl (*8*). Thus the fibers of interest for behavioral studies are those that respond to water following NaCl. Such fibers have not been observed in the rat chorda tympani but they have been observed in the rat glossopharyngeal nerve (*3, 9*).

Another source of information about water is potentially available in the taste system of the rat. Saliva stimulates NaCl-sensitive fibers. Water removes the saliva, producing decrements in these responses (*10*). Although we do not know if such decrements can mediate sensations, the possibility should not be overlooked.

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Bartoshuk appears to be suggesting that the reason thirsty rats drink more warm water than cool water may be that they prefer the taste of warm water. Until recently this preference explanation seemed unlikely, as thirsty rodents prefer cooling air (*1*) and cool metal (*2*). Furthermore, we obtain parallel suppressions of fluid intake whether we cool tap water, distilled water (*3*), or isotonic saline (*4*). Nevertheless, the possibility of a preference for warm fluids remained. We have recently completed preference studies and can now report on the preference for water as a function of water temperature and thirst (*5*).

Rats were given two-bowl, drinkometer-monitored preference tests. As we predicted, most rats deprived of water for 23⅔ hours preferred cool (6°C) to warm (36°C) water. Contrary to our prediction, the preference for cool water lasted only for the first 2 to 6 minutes of the 20-minute drinking session. After the first 2 to 6 minutes the preference shifted to warm water. By the end of the 20-minute preference test, intake of warm water exceeded that of cool water. Mendelson (*6*) has reported similar findings. In a variable-interval, bar-press situation, where very little water was actually consumed, thirsty rats pressed more for cool water, while in 20-minute, two-bowl preference tests warm water was preferred.

The initial preference for cool water is consistent with the preference by thirsty rodents for mouth cooling when no hydration is possible, as is the case in air-licking and licking cool metal. The subsequent shift to a preference for warm water could be responsible for the enhanced intake of warm water that we reported.

As Bartoshuk appears to suggest, suppression of water intake by cool water may be mediated by a preference for warm water. However, when only one water temperature is available on a given day, cool water suppression (relative to warm) begins immediately, that is, during the period of cool water preference (*4*). It is our suggestion that suppression of the intake of cool water is due to an increased capability of cool water to satiate thirst, rather than to an aversive taste.

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