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Comparing temperature and acoustic satisfaction in 60 radiant and all-air buildings

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Abstract

There is little knowledge from occupied buildings of the impact of radiant heating and cooling systems on indoor environmental quality aspects such as thermal comfort, indoor air quality, and acoustics. We present indoor environmental quality survey results from 3,892 respondents in 60 office buildings located in North America; 34 of which used all-air systems and 26 of which used radiant systems as the primary conditioning system. In the current study, we present the survey results of 1,645 occupants in buildings with radiant systems. To our knowledge, this is the largest dataset used in a comparison of occupant satisfaction in radiant buildings. We used an existing database to extract a subset of occupant responses from all-air buildings whose key characteristics match those radiant buildings. The results indicate that radiant and all-air spaces have equal indoor environmental quality, including acoustic satisfaction, with a tendency towards improved temperature satisfaction in radiant buildings.

Graphical abstract

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