















## CONCLUSIONS

- (1) The respondents in the naturally ventilated public apartments showed relatively high utilization of openings on both front and rear side of unit during the daytime (60-80%), whereas very few respondents in the air-conditioned private apartments open their doors/ windows (0-30%). In the public apartments, the occupants tend to open either window or door on each side of unit, but not both. The respondents in the old public apartments open their front door more than the front window during daytime, in contrast with the respondents in the new public apartments. In the case of rear opening, the respondents in both old and new public apartments tend to open the back door rather than back window. The average duration of opening doors/windows was 16-17 hours/day in the public apartments and less than 5 hours/day in the private apartments. Obtaining fresh air, letting wind enter, and obtaining cooling were the main reasons for respondents to open doors/windows, whereas concerns of privacy and security may be the reasons for them to close their doors/windows.
- (2) The diurnal indoor air temperature ranges in the selected apartments were smaller than that of the outdoor temperature, even for naturally ventilated apartments. It indicates that the ventilation rates in these apartments were not necessarily sufficient to change the indoor air even when the openings were utilized.
- (3) The occupants tend to perceive their thermal condition as 'hot', thus the preference for cooler indoor condition was evident. To improve their thermal comfort, the occupants in naturally ventilated apartments tend to increase indoor air speed to enhance skin evaporation by opening doors/windows. Fans were also utilized to further increase the air speed, especially during the nighttime. Correspondingly, most of the respondents regarded their sensation for air flow as 'high' and preferred 'no change' or 'more air flow' for the current air flow condition.
- (4) The results of multiple regression analyses implied that among the selected factors, the behavior of opening and closing doors/windows is affected not only by thermal sensations and preferences, but also building profiles and usage of cooling appliances. Major factors included 'size of balcony', 'size of corridor space', 'usage of fan', 'energy for cooling' and 'preferences for background noise'. In designing apartments, more attention should be drawn to the size of balcony and corridor space to encourage the occupants to more actively open their doors/windows.
- (5) In this study, air temperature, relative humidity, and globe temperature were measured during one week period. In the future study, the resulting indoor air flow and air change rates under the open/closed window conditions should be analyzed to further understand the occupants' adaptive behavior by opening windows.

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