



Impact of Hotels' Energy Efficiency on Guests' Perceived Comfort

Xinyi Qian, PhD, Tourism Center; Katrina Nygaard, Humphrey School of Public Affairs; & Carl Samuelson, Michaels Energy

Background

- Research on hotel guest experience is abundant. Since 1990, interests in environmental sustainability and hotel guests' perceived comfort have grown. However, little research examines the effect of energy efficiency on guest comfort, which should be "the primary consideration in any hotel building project" (Energy Star 2008, p. 2).
- The **purpose** of this study is to understand if and how energy efficiency affects guest comfort. The relationship between hotels' energy efficiency measures and perceived guest comfort indicators was assessed.

Methodology

- Data Collection**
- Survey of guests in five mid-scale 3-star hotels, mid-May to mid-June, 2014 (n=125)
 - Energy efficiency data collected by Michaels Energy
- Content**
- Indicators of perceived comfort (e.g., bed comfort, temperature consistency, water pressure) were measured on a 7-point Likert scale
 - Whether guests would choose energy efficient hotels, assuming other criteria were comparable
 - Trip purpose (business or leisure)

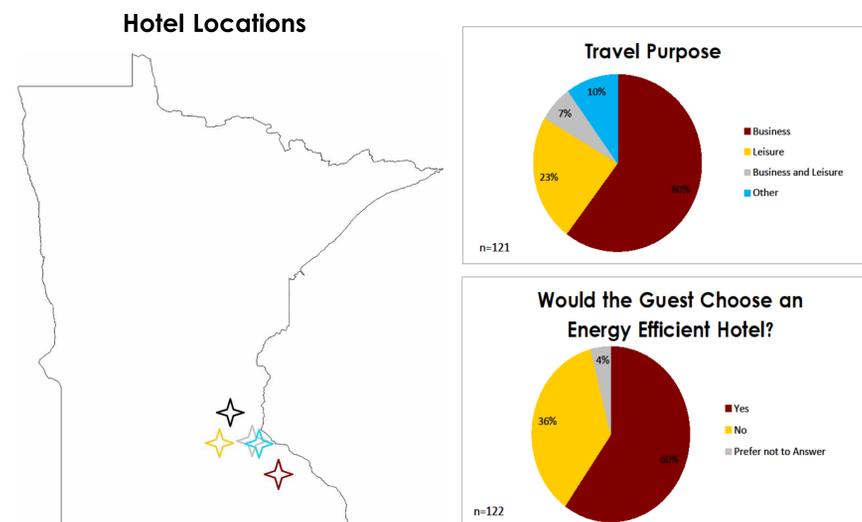
Energy efficiency measure	Perceived comfort indicator
EER: higher EER rating=quieter heating & cooling units that maintain more accurate temperature	Perceived temperature consistency
Exhaust fan rating: higher rating=drier air	Perceived air quality
Gas & electricity use	Perceived room comfort
Water temperature	Satisfaction with water temperature
Shower head flow	Satisfaction with water pressure
Water use	Perceived room comfort

Sampling Convenience sampling

Analysis Descriptive, t-test, ANOVA, ANCOVA in SPSS (version 22.0)

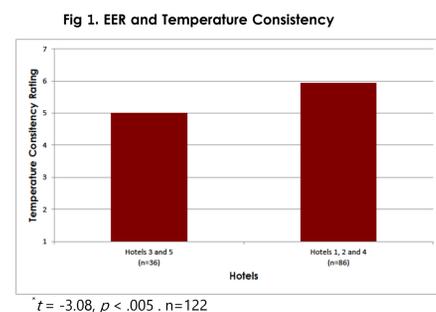
Results

Property Location & Guest Characteris-

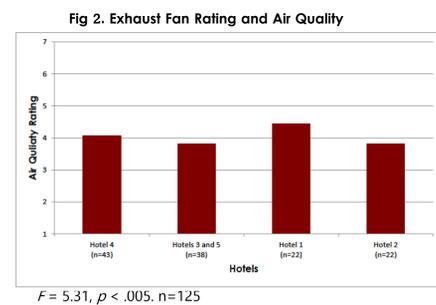


Energy Efficiency and Guest Comfort

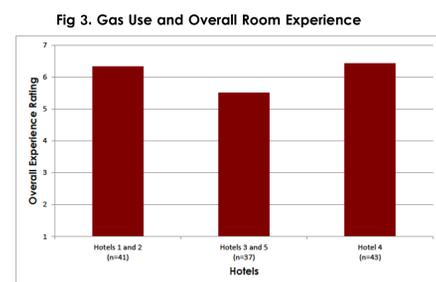
Of the seven efficiency measures tested, four had no significant effect on satisfaction or comfort: water temperature, shower head flow, water use and amount of electricity. Three other energy efficiency measures did significantly affect perceived comfort: energy efficient rating (EER), exhaust fan rating, and natural gas use.



Higher EER ratings → **Greater** perceived temperature consistency (Figure 1).



Higher AND **lower** exhaust fan ratings (i.e., dryer & more humid air) → **Better** perceived air quality (Figure 2).



Least AND **most** natural gas use → **Better** perceived room comfort (Figure 3).

Discussion

Management can change four areas with no significant impact on guests' perceived comfort:

- Reduce electricity use
- Lower water temperature
- Lower water pressure to "low-flow" status
- Reduce water consumption

EER: This project provided initial evidence for the effect of EER rating on perceived temperature consistency. Hotel owners can confidently invest in more efficient units, as the investment will reduce their energy bills and result in greater perceived temperature consistency.

Exhaust Fan Flow: Although significant, exhaust fan flow may not be sufficient enough to explain perceived air quality. Other variables, such as fan location and room tightness, also affect air quality but were not measured in this study.

Gas Usage: Management practices such as regular maintenance that reduce gas use will contribute to guest comfort as well.

Future Research

- Expand pilot study to survey additional hotels
- Collect more comprehensive technical data, such as exhaust fan location or window location, to better reflect hotels' energy efficiency measures and the effects on perceived comfort.
- Conduct the survey on both weekdays and weekends to access both business and leisure travelers; consider surveying on complimentary airport shuttles (where available).

Acknowledgements

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Partners The five hotels in which data collection took place

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