



InnoRenew CoE

Livade 6, 6310 Izola/Isola, Slovenia, T: +386 40 282 944, E: coe@innorenew.eu, www.innorenew.eu



The Use of Survey Questionnaires to Measure Attitudes and Behaviours Related to Sustainable Building Issues

Ana Slavec, PhD

ana.slavec@innorenew.eu

Background



- The building sector accounts for almost third of the global final energy consumption
- By understanding the behaviour of building users, we can help reduce their impact on the environment
- Survey methods are a popular method study occupant behaviour, but it is not clear what is their quality

Objectives of postdoctoral project „Using questionnaires to measure attitudes and behaviours of buildings users“

- Identify existing measurement instruments used to collect and understand the building users in the design process and post-occupancy evaluation
- Evaluate the validity and comprehensibility of existing instruments
- Design and assess improved survey questionnaires

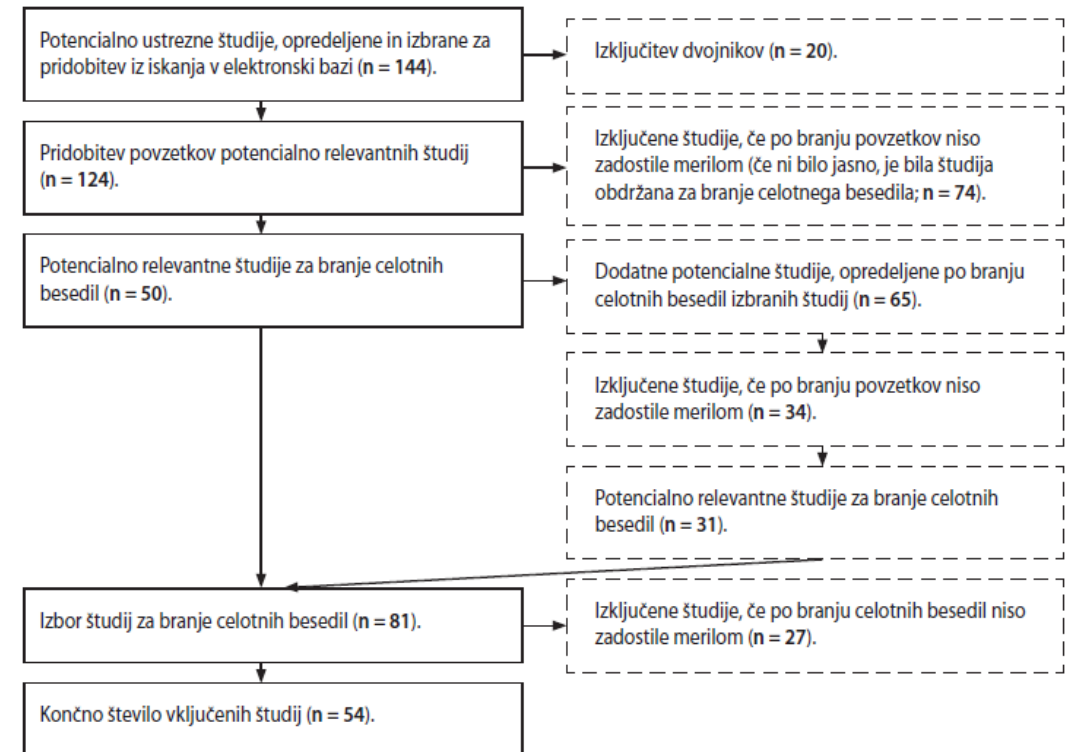
Funded by the Slovenian Research Agency (Z5-179)



Related study as part of a masters and dissertation project at the University of Ljubljana

54 studies included that met the criteria:

- Empirical quantitative studies focusing on satisfaction with the living environment, the place of residence and/or the neighbourhood
- Major focus on at least one of the following levels: residential unit, building or residential complex, or neighbourhood
- Focus on residential buildings
- Assessment of satisfaction with the living environment based on several aspects of the living environment based on self-assessment questionnaires
- Adult population, excluding patients and students



Source: [Smrke et al. 2018](#)

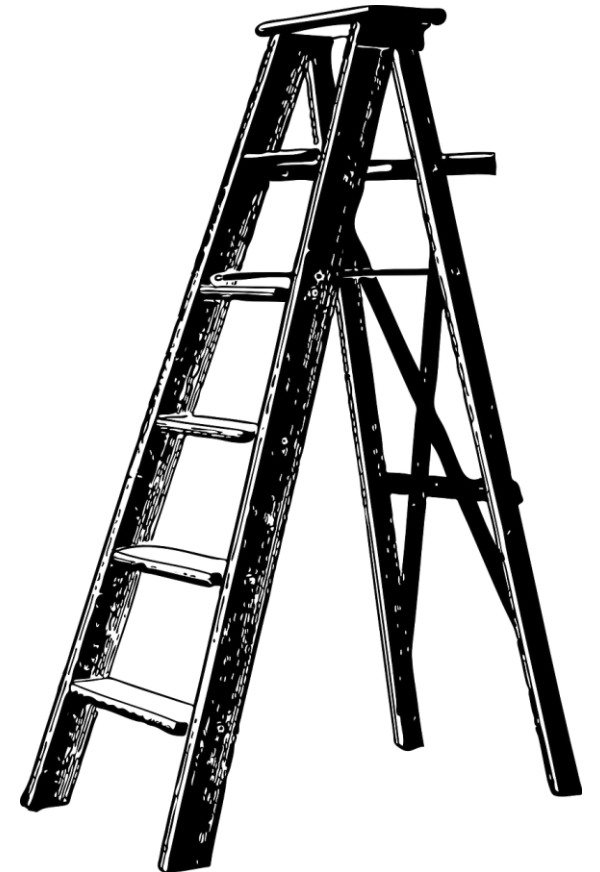
Systematic review of 54 studies (Smrke et al. 2018)

- 19 out did not report what is the source of the questionnaire or how it was developed, 18 developed their own questions, others adapted (9) or used (8) existing scales.
- They included from 3 to 107 aspects of living conditions (28.6 on average) which were in form of a list of aspects (n=29) or statements (n=14) except for 4 studies.
- The most popular format is a 5-point Likert scale (n=21).
- 30 did not report any reliability measures, only 20 studies (17 different questionnaires) reported Cronbach alpha.
- Only 25 studies (23 questionnaires) reported some kind of procedure for evaluating the internal structure.
- Only 19 studies (17 questionnaire) checked external validity.



Extension of Smrke et al. 2018 with evaluation of additional survey quality aspects

- Data collection (sampling, response rate, survey mode)
- Pre-testing of instrument
- Characteristics of the **response scale** (evaluative dimension, polarity) **and its labels** (verbal labels, number of fixed reference points, order of labels, symmetry, neutral alternative, don't know option)
 - Saris & Gallhofer (2017): [Estimation of the effect of measurement characteristics on the quality of survey questions.](#)
 - DeCastellarnau (2018): [A classification of response scale characteristics that affect data quality: a literature review.](#)



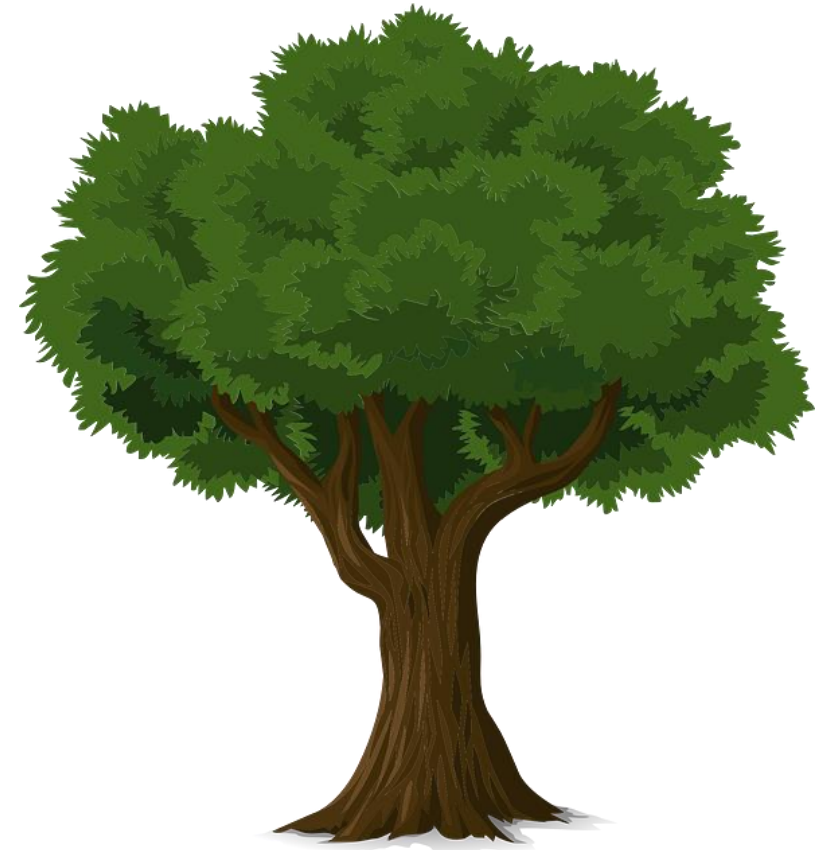
Response scale characteristics

- Most use item specific (e.g. satisfaction) not agree/disagree scales
- Bipolar scales are more frequent than unipolar scales and they are mostly symmetric
- In most items, labels are only partially labelled
- Most scales do not have fixed reference points
- Almost all scales are ordered from negative to positive
- Neutral alternative is rarely explicitly provided
- In most cases it is not clear if a Don't know option was offered



Consideration of environmental aspects

- Only a few studies included indoor (thermal) comfort and even less energy consumption
- For a better overview of environmental aspects, the literature review should be expanded with additional keywords (not limited on residential satisfaction)



Future research directions

- Extension of literature review to include concepts beyond satisfaction and non-residential buildings
- Development of improved survey questionnaire and implementation of two case studies
- Future project on socio-psychological aspects of long-term high-impact decision-making & reducing the carbon footprint of building construction and its supply chain (with colleagues from University of Graz)





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Thank you for your attention. Any questions?