Reading reflections

USP 570

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Week 7

* An new ‘Diamond’

Levinson and Krizek (2018 Chapter.11) introduced .

* Objectively measure subjective qualities

perceptual qualities

Ewing et al. (2006)

Ewing and Handy (2009)

Clemente and Ewing (2005)

This reaserch try to answer two questions:

1 which urban design qualities have significant effects on the average value of walkability and how much are the effects ?

2 Which factors among more than 100 physical features have significant effects on the average scores of urban design qulities and how much are the effects.

* Discussion: predetermined or prior information.

The risk of circular argument. the viewers are not randomly selected, the scenes are not randomly selected. the conclusion proved that the 48 clips followed a series of criteria, the raters have simular opinions on walkablity, and highly consistent with previous literatures. It doesn’t mean the results is wrong, but the methodology are qusetionable.

The results show the experts’ opinions on walkability are same with literatures

* FF design the Fractional Factorial Design

“A major use of fractional factorials is in screening experiments—experiments in which many factors are considered and the objective is to identify those factors that have large effects. Screening experiments are usually performed in the early stages of a project when many of the factors initially considered likely have little or no effect on the response. The factors identified as important are then investigated more thoroughly in subsequent experiments.”

On the contrary, this reaserch use FF design as a method of selecting treatment. “The sample allowed us to capture the main effects of each urban design quality on overall walkability, plus two-factor interaction effects.”

“Although we weren’t able to exactly match the fractional factorial design in all cases, following the design as close as possible resulted in the selection of clips that are distinctly different as the following figures illustrate. Where ratings for two or more clips matched factorial design equally well, clips were selected to maximize geographic diversity.”

“That is, knowledge of the AB interaction is more useful than knowledge of the main effect. A significant interaction will often mask the significance of main effects. These points are clearly indicated by the interaction plot in Figure 5.4. In the presence of significant interaction, the experimenter must usually examine the levels of one factor, say A, with levels of the other factors fixed to draw conclusions about the main effect of A.”

In a later paper, the authoers improved the method by fractional factorial design, a means 8 factors and 4 independent generators. With 48 observations, it has 16 runs and 3 replication.

A FF design is used to examine the effects of factors, is not used to select samples. A factor with fixed effect

“Care should be exercised in choosing the generators so that effects of potential interest are not aliased with each other. Each effect has 2p − 1 aliases. For moderately large values of k, we usually assume higher order interactions to be negligible, and this greatly simplifies the alias structure.”

The eight urban design qualities.

Author didn’t tell us how to select the facotors and the intercations. Anohter issue rised that the 48 clips are not randomly selected.

The researcher intentively select them from more than 200 clips in order to best “match” the combinations of high/low values. This method violate the design requirment and might be problematic. If some scenes don’t show obvious high or low values, a design including 3 levels of high/intermediate/low might better fit this study.

This is not FF design for measuring effects. It is selection of combination

* The Crossed Multilevel Design

The ‘cross-classified random effects models’ is one kinde of mixed models.

In one kind of 2-level model, there is two crossed random factors at Level 2.

Each observation at Level 1 is nested in the combination of these two random factors. These models need to be specified correctly to capture the effects of both random factors at Level 2.

* random factors and random effects

Moreover, researcher realized the rator are random factors

Fixed effect: The factor levels are selected so that their effects on the response are valid only for those factor levels. Random effect: The factor levels are selected at random from a large number of factor levels. The effects of these factor levels on the response are valid for all the factor levels in the population from which those were selected.

“Alternatively, the a treatments could be a random sample from a larger population of treatments. In this situation, we should like to be able to extend the conclusions (which are based on the sample of treatments) to all treatments in the population, whether or not they were explicitly considered in the analysis. Here, the are random variables, and knowledge about the particular ones investigated is relatively useless. Instead, we test hypotheses about the variability of the and try to estimate this variability. This is called the random effects model.”

“The Bayesian paradigm prescribes that the sample information be combined with the prior information using Bayes’ Theorem to obtain the posterior distribution . All inferences about are now based on the posterior distribution.”

# References

Clemente, Otto, and Reid Ewing. 2005. “Final Report-Identifying and Measuring Urban Design Qualities Related to Walkability.”

Ewing, Reid, and Susan Handy. 2009. “Measuring the Unmeasurable: Urban Design Qualities Related to Walkability.” *Journal of Urban Design* 14 (1). Taylor & Francis: 65–84.

Ewing, Reid, Susan Handy, Ross C Brownson, Otto Clemente, and Emily Winston. 2006. “Identifying and Measuring Urban Design Qualities Related to Walkability.” *Journal of Physical Activity and Health* 3 (s1): S223–S240.

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