

# Preference Analysis Methods in Cartographic Research. Map Reader Preference for Lettering Typefaces on printed Maps.

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## Abstract:

Our research team is examining the effectiveness of preference analysis for map evaluation. Preference analysis is a method used widely in consumer behaviour analysis (Gua, Liao, and Zhang, 2020). This method looks at users and how they react to options to determine which item from a group is most desirable. In the cartographic field we can look at this as a method for determining which map design choices cartographers make are more desirable to map reader. Map Design is a series of choices by the cartographer to create a spatial representation of data that in the end will aid map readers to understand the information provided. For a lot of cartographic research history, the evaluation for maps was done at deterministic level. Maps were designed for map reader use and effectiveness. The map design choices were tested on how the map reader understand the map and its information. Classic research like that of Flannery's perception of circle symbols on maps (Flannery, 1971, Gilman, 1981) work to find a value for perceptual adjustment for cartographer. This approach to map design research provided cartographer with valuable information to improve design for better map communication. The major drawback to this type of research stems from sampling and repeatability of the research. Flannery's idea of underestimation of circle size is correct but the exact value of underestimation is not constant for all map user and situations (Gilman, 1981). This led to the debate regarding whether variable perceptual process exist but should map design decision be influenced by them. This research acknowledges that a debate exists but takes no stand on whether a map design should or should not implement perceptual process known into map design.

To examine the effectiveness of Preference Analysis for map design research some type of research question needs to be identified. For this project the research team chose to look at the typeface choice for map design. We are using the term typeface choice and not font specifically to allow lettering on the map to be at different sizes in the same typeface. In this project we are examining typeface choice. There are two primary factors being looked at in this study, typeface family and kerning. Starting with typeface family most taxonomies of typeface use four families of typeface: serif, sans serif, decorative, and cursive. Typefaces over time have used either serif or sans serif. Many maps do use typeface that would be categorized as decorative or cursive. The common term used for this lettering is calligraphy. In cartography you can see calligraphy in titles of maps or for large area phenomena i.e. oceans, seas and deserts. In this study there will be no map title or area labelling. In the study will select 4 commonly used serif and four sans serif typefaces to test. The number of Typefaces constantly growing so this is not an exhaust test of all typefaces. The typeface family variable can be addressed as "ending stroke" since serif family typeface use ending strokes on letters while the sans serif family do not. A second typeface variable to examine will be kerning. Kerning is the process of varying the letter spacing in words to make them appear better. Typefaces use kerning by having specific letter spacing for specific letter pairs. Common kerning pairs are: "LT", "LV", "LY", "TA", "P", "Ta", "VA", "Yo", "Ya", "PA", "VA", "To", "T", "P", "F", "AY". For typefaces you can use them with or without kerning so this factor will be examined.

The methodology for the research will be using and test booklet approach. Subjects will go through the subject consent process and follow giving consent the test booklet will be given to the subject. They will proceed through a series of trials at their own pace. Each trial will consist of two tasks. The first task asks the student to determine how many maps on the page have a target symbol. The possible answer will be 0, 1, 2, 3, 4 depending on the trial. This task is assigned to make sure subjects look at all four maps. The second task will have the students select their preferred map. Subjects will be asked to take a moment to look at the maps and choose the one they like best. Each trial will have four maps on the page. Two maps using a serif typeface and two maps using sans serif typeface. The two serif typeface maps will have one with kerning on and one with kerning off. The two sans serif maps will have the same pattern of one with kerning and the second without kerning. The typeface and kerning option will be randomized by combination and location on the page. At the end of the experiment subject will be debriefed on the goal of the research. The test booklet will be

collected and subject responses digitized. Each trail will be coded for fonts used, kerning on and off and location of each four map combination locations. The results of the search task both the answer given and the correct answer. The hypothesis of this research project is that typeface family and kerning will have no effect of subject's map preference. A series of preference analysis methods will be run on the data set to test this hypothesis.

## References

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