

On a distance between the attitude of two subjects with respect to a third

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Abstract

The paper deals with three possibilities of measuring the distance between the attitude of two subjects with respect to the attitude of a third subject or to a prescription stated by formal or informal groups of subjects.

An expression which respects the the definition of distance between two groups or a subject and a group is given. Let $I_1 = \{a, b\}$ and $I_2 = \{c, d\}$ be two sets, we define the following distance index:

$$D(I_1, I_2) = D(\{a, b\}, \{c, d\}) = \begin{cases} \min[|a - c|, |b - c|, |a - d|, |b - d|] & \text{se } I_1 \cap I_2 = \emptyset \\ 0 & \text{otherwise} \end{cases}$$

This expression is not a metric, it will be shown that starting from this one three distance functions can be constructed, with reference to the case where $I_2 = \{c\}$, that is where the second set reduces to a single element.

These metrics will be given the symbol $d_i(a, b; c)$, $i \in \{1, 2, 3\}$ and assume the respective forms:

$$d_1(a, b; c) = \frac{1}{2} (|a - c| + |b - c| + |a - b|),$$

the first of them,

$$d_2(a, b; c) = \frac{2|a - b|}{|a - b| + |a - c| + |b - c|},$$

the second, and

$$d_3(a, b; c) = \frac{|a - b| (|a - c| + |b - c| - |a - b|)}{\sqrt{4(a - b)^2 + (|a - c| + |b - c| - |a - b|)^2}},$$

the third one.

It will be shown that they obey to the axioms for metrics, and a simple example for each of them is reported.

References

- Carol L. Gohm (2003). Mood Regulation and Emotional Intelligence: Individual Differences. American Psychological Association
- Drew Westen, Robert Rosenthal (2003). Quantifying Construct Validity: Two Simple Measures. American Psychological Association