Method to test spatial structures of spatial terms

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Introduction

When the structure of a spatial term; *above, below, left, right,* etc, is tested, a rating task is used (Crawford, Regier, and Huttenlocher, 2000; Hayward and Tarr, 1995). This task is very easy to perform and less tiring for participants. In addition, it is suitable for investigating areas or locations of boundaries of spatial terms. Kojima and Kusumi (2002), however, pointed out that the task does not entail relative relations between spatial points. Thus they used Thurstone's law of comparative judgment (case V) instead. This method still does not imply the locations of boundaries of spatial terms by itself, i.e. appropriate fit patterns of spatial terms have been kept intangible.

In this study, I suggest a systematical combination of both the methods in order to investigate spatial structures of spatial terms and make fit patterns of them.

Method

I performed two psychological experiments. The basic method in both experiments was the same as follows. Stimuli were generated by computer and presented on a CRT at a viewing distance of approximately 115cm. For each trial, the instruction word (a Japanese spatial term, ue 'above') would first appear in the center of the screen for 1000ms in order to arouse a participant's attention to the center of the screen and to remind him/her what word he/she should judge or compare. Then, in experiment 1, a black square (1°×1° side) was centered as a reference object, and one black dot (0.12°×0.12° diameter) was randomly presented as a target object, occupying 45 fixed positions that were located 45 lattice points in the screen. A participant was required to judge whether the location of the dot was applicable to ue in relation to the reference object. In experiment 2, a black square was centered as a reference object, and two black dots were randomly presented as target objects, occupying 45 fixed positions as in experiment 1. A participant was required to compare the locations of the two dots in relation to the reference object, and to choose the dot more applicable to ue.

Results and Discussion

The data of the first experiment consisted of two rating values (0 or 1). The average judged value in each location was calculated based on them. The data of the second experiment were the paired comparison data. They were processed and scaled by Thurstone's law of comparative judgment (case V). I tried to combine these data by multiplication between judged value and scaled value in the same location (Fig.1).

By this method, we can depict in one fit pattern figure not only the locations of boundaries but also the relative relations between the locations.
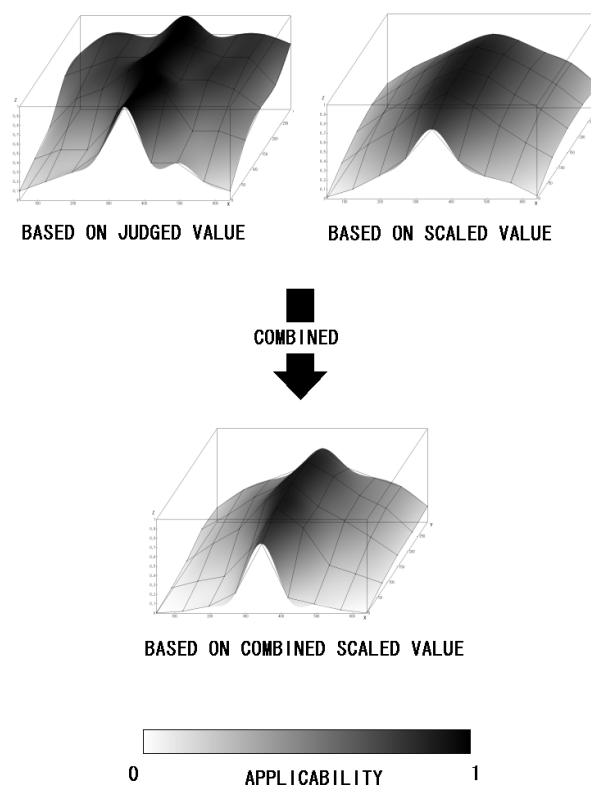

Figure 1: The fit patterns of ue by each method

Acknowledgments

References

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