EXPERIMENT 2

Experiment 1 obtained two negative results—absence of set-size effect and no imputation about missing information in examination performance. To check the generality of these two findings and to further study cognitive algebra in task performance, Experiment 2 required school teachers to predict performance in three types of competition, namely, puzzle solving, vocal music, and drawing-painting. Since academic and nonacademic tasks yield evidence for different cognitive algebra (Srivastava, 1984; Surber, in press), these three nonacademic tasks were studied systematically.

Method

Stimuli and Designs

Descriptions of stimulus persons were prepared in same way as in Experiment 1. Motivation was defined as "one's willingness to do well in contest, prior practice, effort during competition, concentration, seriousness, and attempt to do one's best". Ability to solve puzzles was defined as intelligence, brightness, and creativity of each participant. Musical ability referred to tenderness and clarity of voice of each participant (Srivastava, 1984). Painting ability referred to creativity, intelligence, and imagination of each participant. Both motivation and ability information were
described along a 7-point scale: Extremely low, very much below average, below average, average, above average, very much above average and extremely high.

There were two stimulus designs. Design 1 was a 2 x 3 x 3 (Set-size of motivation information x Motivation x Ability). The set-size factor had one or three identical pieces of motivation information, and the levels of motivation and ability were very much below average, average, and very much above average. This design generated descriptions of 18 stimulus persons. Design 2 had just one piece of information about ability corresponding to the levels of ability in Design 1.

In addition to these 21 stimulus descriptions, there were 9 filler and end anchor descriptions and 10 practice descriptions. They included levels more extreme than those used in the regular description of stimulus students. They were intended to enable the subject to use the entire scale in uniform manner.

Procedure

The procedure was similar to that in previous experiment. Teachers were told that 30 ten-year-olds were to participate in a competition organized by the school. The three types of competitions were puzzle solving, vocal music, and drawing-painting. These three types of task were presented to different groups of subjects.
After practice session, the subjects rated the stimulus descriptions three times in different shuffled orders. Data for all the three trials of judgment were coded and analyzed. On the completion of the experiment, the experimenter thanked the subjects for their cooperation in the experiment.

Subjects

Subjects were 60 (30 male and 30 female) middle school teachers drawn from eight Central Schools of Delhi: Kendriya Vidyalaya, I.N.A. Colony; Kendriya Vidyalaya, Cantt. 1; Kendriya Vidyalaya, Cantt. 2; Kendriya Vidyalaya, R.K. Puram, Sector IV; Kendriya Vidyalaya, R.K. Puram, Sector VIII; Kendriya Vidyalaya, Indian Institute of Technology, New Delhi; Kendriya Vidyalaya, Janakpuri; and Vishesh Kendriya Vidyalaya, Janakpuri. They were randomly divided into three groups and were given one of the three competition tasks. The mean age of the subjects in puzzle solving, vocal music, and drawing-painting competition tasks were 32 years 15 days, 34 years 6 months 19 days, and 33 years 3 months 29 days with the respective ranges of 25 years 9 months to 42 years 3 months, 23 years 6 months to 47 years 3 months, and 22 years 10 months to 45 years 3 months. Each subject spent around 40 minutes on the experimental task.

Results

Effect of Set-Size of Motivation Information

Figure 3 presents Set-size x Motivation, Set-size x Ability, and Motivation x Ability effects from Design 1. According to set-size equation (i.e., Equation 6), the curve based on three pieces of information should have steeper slope than that
Figure 3. Factorial plots of Set-size of Motivation Information x Motivation, Set-size of Motivation x Ability, and Motivation x Ability effects from Experiment 2.
based on one piece of information. This trend seems to be present in the left graph of Figure 2. In the overall analysis of variance (Appendix C), the Set-size x Motivation interaction was highly significant $F(2,108) = 6.83, p < .01$.

A closer examination, however, discloses that the set-size effect is restricted to only positive information. That is, three positive observations produced more polar response than one positive information. Because of this, the main effect of set-size was also significant $F(1,54) = 9.24, p < .01$. It may be stated, therefore, that the set-size effect holds only with positive information in case of school teachers.

The center graph of Figure 2 presents a distinguishing test between adding and averaging rule. The two curves have a tendency to converge, $F(2,108) = 4.15, p < .05$. This convergence implies that addition of positive value of motivation to negative value of ability has raised the response much more than when it was added to the positive value of ability. This result is in accord with the averaging hypothesis.

The right graph presents Motivation x Ability effect on competition performance. The three curves are nearly parallel. However, there are end effects at the lower, left and the upper, right points of the curve. The lowest point is too low and the highest point is too high. This produced deviations from parallelism pattern, $F(4,216) = 6.14, p < .01$. The deviations
from parallelism are, however, minor. They do not seem to require any serious qualification on the averaging rule.

Another view of the above mentioned results can be had from Figure 4 which has combined factorial plot of data from Set-sizes 1 and 3. Two points stand out clearly. First, the set-size effect is bigger at very much above average level of motivation than at average or very much below average level of motivation. This agrees with the interpretations made earlier that school teachers are more influenced by three positive pieces of information than one positive piece of information. Second, the top two curves have a tendency to converge as required by the averaging hypothesis (Singh & Bhargava, 1982 a).

**Imputations**

The dashed curve of Figure 4 represents judgments based on information about ability alone. This curve crosses over the two center curves convincingly, \( F(4,216) = 70.49 \). Since the two curves did not differ significantly, \( F(2,108) = 2.42 \), it can be said that teachers did not make any imputation about missing information. It should be again emphasized that test between adding and averaging rules based on neutral pieces of information can not be always expected to yield clear diagnosis of the rule underlying judgment.
Figure 4. Combined factorial plot of Motivation x Ability effect from Set-sizes 1 and 3 conditions of Experiment 2.
Task and Sex of Subject Differences

In overall analysis of variance (Appendix C), there was not any moderating effect of the tasks or sex of subjects. It can be concluded, therefore, that the results of present experiment are generalizable to both male and female teachers and to three types of competition situations.

Discussion

Experiment 2 obtained two main results. First, set-size of information affects teachers' judgment only in positive condition. In other words, three positive opinions produced more polar response than one positive opinion. This result indicates that the set-size effect holds true only in restricted conditions with teachers. Furthermore, it is operative in case of nonacademic tasks.

Second, there was no evidence of any imputation about missing information. The curve based on ability information alone crossed over curves based on ability and average pieces of motivation information. This result is similar to the one obtained in Experiment 1. It may be stated, therefore, that teachers make no imputation about missing information.