Group Creativity: Less Than the Sum of its Parts?

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Abstract

Differences between the creativity of a group and that of several individuals combined are investigated in a college course workshop setting. It was found that although students reported higher confidence following the group brainstorming session, twice as many unique ideas were generated when the students worked independently compared with when they worked as a group.

Introduction

We hypothesize that a group of individuals is more creative than an individual group. This will be supported if the number of unique ideas generated by the individual brainstorms is greater than the number of unique ideas generated by a group brainstorm. Mullen et al. found that individuals have higher productivity in brainstorming sessions than in a group[3]. Larey et al. also found that interactions during brainstorming sessions resulted in convergent tendencies and hindered divergent thought[2].

Methods

Over the course of two workshop sessions, group creativity was tested by comparing the number of unique ideas generated for the use of a ping pong ball and a paper clip. In the first week, students participated in group brainstorming to come up with ideas together; in the second week, students explored ideas individually. In addition to counting the number of unique ideas generated in each case, a survey was administered after each brainstorming session to further quantify the results of the investigation.

Results

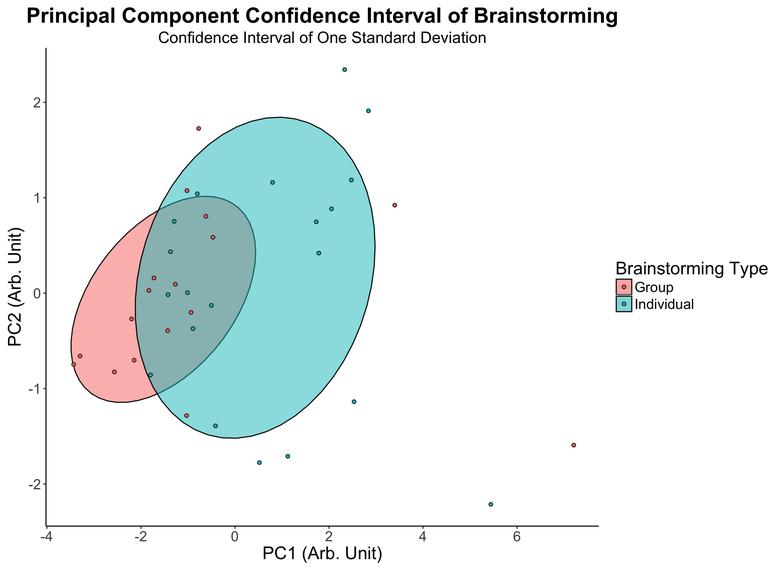

Figure 1: PCA Results

Principal component analysis (PCA) was completed on the survey data. PCA was selected as a way to reduce variables and check for correlation between the data. As seen in Figure 1, there is no distinction between PC1 and PC2. The overlap in confidence intervals suggests that there were no significant factors leading to a distinction in human perception of survey type. This test reinforces the negative hypothesis that students are receptive to differing brainstorming methods.

Shown in Figure 2, is the histogram representing confidence in the results submitted from students. The dashed lines represent the mean value for each brainstorming type. For each question's histogram, the mean value for group brainstorming was higher than that of individual brainstorming. This suggests that there may be a slight psychological effect from differing brainstorming methods.

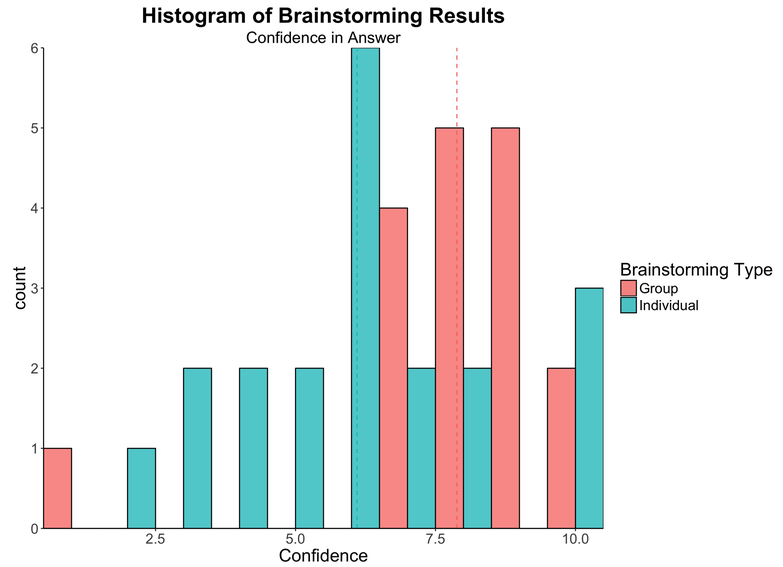

Figure 2: Histogram of Confidence Answers

	Average	SE
Independent	28	11
Group	14	4

Table 1: Brainstorming Type Submissions

There was double the amount of discrete suggestions in the individual brainstorming compared to the group brainstorming.
All data can be found online at https://github.com/AdamBriggs/Geometric-Optics-Data-Analysis.

References

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Conclusions

- Independent operation doubles a group's creativity.
- Students have more confidence in creative answers generated with a group.