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ESTIMATION OF PROPORTIONS OF VARIABILITY IN TWO-WAY NESTED RANDOM EFFECT MODEL

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SUMMARY

An accurate estimate of intraclass correlation coefficient (ICC) and its confidence interval is very important in order to interpret the proportion of variability accounted for by factors in an experiment correctly. This paper focuses on using ICC and its confidence interval to estimate proportions of variability in a two-way nested random effect model. The estimate of the ICC estimators was obtained using the analysis of variance method of computing variance components. The confidence interval was constructed and compared based on the interval width using Analysis of Variance (ANOVA) and Shrout and Fleiss (SF) methods. Dataset on weaning weights of progeny was used for numerical illustration. The results show that the proportion of variability due to error was greater than that of the main-factor and sub-factor respectively. Also, the ANOVA method was observed to be better than the SF method in constructing confidence interval for ICC because it gave the minimum width for the confidence interval. This implies that the ANOVA method provides precise confidence limits for the ICC estimators in estimating proportion of variability in a two-way nested classification.

Keywords and phrases: Analysis of variance; estimator; intraclass correlation coefficient; interval width; proportion of variability.

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