2.13 Concluding remarks

PERMDISP is designed to test the null hypothesis of no differences in dispersions among *a priori* groups. Although this may be the only goal in some cases, PERMDISP can also provide a useful companion test to PERMANOVA in order to clarify the nature of multivariate effects on the basis of a chosen resemblance measure.

Table 2.1 provides a synopsis of the logical inferences arising from the outcomes of PERMDISP and PERMANOVA for the one-way (single-factor) case. Three of the four scenarios yield a clear inferential outcome; the fourth leaves some uncertainty for interpretation. Namely, if both PERMDISP and PERMANOVA tests are significant, we will know that dispersion effects occur, but we may not necessarily know if location effects are also present. Examining ordination plots and the relative sizes of within and between-group resemblances will be important here, but it is undoubtedly true that there is scope for further work on the implications of a significant outcome for the PERMDISP test on the structure and interpretation of the associated PERMANOVA tests. Finally, in more complex designs with crossed or nested factors, several different PERMDISP analyses may be needed (e.g., at different levels in the design) in order to clarify dispersion effects, if any.

Scenario	*PERMANOVA*	*PERMDISP*	*Inference*
1	Not significant	Not significant	No location or dispersion effects
2	Significant	Not significant	Location effect only
3	Not significant	Significant	Dispersion effect only
4	Significant	Significant	Dispersion effect and perhaps (although not necessarily) a location effect as well.

Table 2.1. Outcomes and potential inferences to be drawn from joint analyses done using PERMANOVA and PERMDISP for the one-way case.

Revision #1
Created 10 August 2022 10:59:00 by Arden
Updated 10 August 2022 11:03:25 by Arden