

Standardisation of statistical notation in the Proceedings of the Australian Physiological and Pharmacological Society

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The book by Ellis (1972), previously recommended as a guide for symbols and abbreviations, is superseded by Baron (1988), q.v.

The entries under "standard error", however, still suggest that some clarification is required before this work can be used to standardise statistical notation for the "*Proceedings*". The guide-lines that follow are intended to provide this clarification. In all respects other than in reference to the standard error the abbreviations recommended here are those of Baron (1988).

Abbreviation for number of observations. Use lower case (italic) *n*.

Abbreviation for probability. Upper case (italic) *P* should be used, rather than *p* (Pressure) or *p* (pico-).

Standard deviation and standard error. Authors should cite standard deviations when they are concerned to describe the variability of individual values about their mean. In such cases the data are likely to be descriptive rather than strictly experimental. Baron (1988) suggests SD or *s*; we prefer to use SD (N.B. A *change* - this differs from previously recommended s.d. (Ellis, 1972)).

Authors should cite standard errors when they are concerned to indicate the precision, as an estimate, of a particular statistic such as a mean. The preferred abbreviation is SE (*change*, no longer s.e.) in all cases where it is clear to which statistic the SE is referred, but (in accordance with the notation used in *Clinical and Experimental Pharmacology and Physiology*) authors may use SEM for the SE of a mean. When quoting a SE it is preferable to include *n*, the number of observations on which the SE is based (see below).

The use of \pm . It is normal practice, in the "*Proceedings*" and elsewhere, to use \pm to introduce a SE. In the "*Proceedings*" we will disregard the ruling against this usage in Baron (1988). This matter is discussed by Bliss (1967), who agrees that "in the recent literature" a term following a \pm sign is unambiguously a SE.

Inappropriate(?) SE. Authors should consider seriously their objective for including SE when these include variability that is not involved in the statistical test of significance used in the study, for example, the SE of means when the analysis uses a paired "*t*" test. In such cases it may be preferable to quote the SE of the mean difference as well as or instead of the individual SE.

Improper SE. Authors should remember that the precision of a statistic or a comparison between statistics will usually involve variability "between animals (experimental units)". A value of *n* that is inflated by the inclusion of multiple observations on the same animal (experimental unit) must not be used as the basis for calculating the SE, or for carrying out tests of significance, where the generalisation is between animals.

Baron, D.N. (1988) In: *Units, Symbols and Abbreviations*, ed. Baron, D.N., pp. 1-64. London: The Royal Society of Medicine.

Bliss, C.I. (1967) *Statistics in Biology*, p. 137. New York: McGraw-Hill.

Ellis, G. (1972) In: *Units, Symbols and Abbreviations*, ed. Ellis, G. Revised edition, pp. 1-36. London: The Royal Society of Medicine.