

Annett M. A classification of hand preference by association analysis.
Brit. J. Psychol. 61:303-21, 1970.
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An association analysis was made of the responses of young adults to a hand preference questionnaire. Many patterns of preference were distinguished and there were no marked differences between adjacent classes. These findings are believed to demonstrate that hand preference is distributed continuously and not discretely. When it is necessary to classify handedness, the preference continuum can be divided at several levels of discrimination. A second study of hand preference and manual speed showed that it is possible to order the main preference groups for asymmetry of manual skill. Some of the problems in studies of laterality are examined as possible consequences of the treatment of a continuous distribution as if it were discrete. [The *Social Sciences Citation Index*® (SSCI)® indicates that this paper has been cited in over 185 publications since 1970.]

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"My research on laterality began almost by accident when my plans to continue doctoral work on conceptual thinking were not supported. It was relatively easy to collect data on hand preference by questionnaire on an occasional and part-time basis when my children were small, and my husband's developing career enabled me to collect data in several places: Oxford, Sheffield, Aberdeen, and Hull. At the University of Hull, I was appointed honorary research associate and offered the facilities necessary for seeking external funding. The cited work was supported by the Medical Research Council, UK.

"During the 1960s, I used whatever opportunities came my way to collect data from large and complete samples of students, schoolchildren, and recruits, in groups where volunteer effects would be absent or minimal. I wanted to know what proportion of the population is consistently left-handed

for all important actions and what proportion is mixed-handed, preferring the right hand for some and the left hand for other actions. About 30 percent of subjects in several samples were found to be mixed-handed, and three to four percent consistently left-handed. It seemed to me extraordinary, and it still does, that the fact that about one-third of the population is mixed-handed is generally ignored in laterality research.

"By the late 1960s, with questionnaire data on over 2,000 subjects, an analysis could be made of patterns of mixed-handedness. The question was whether it is possible to make clear distinctions between mixed-handers, to say that some are *really* right-handers and some are *really* left-handers. At the suggestion of J.P.N. Phillips, the technique used was association analysis, as developed by botanists^{1,2} interested in meaningful distinctions in plant ecology. A computer program was written for me by M.J. Norman, of the University of Hull, Sub-Department of Computation. The analysis produced a multitude of patterns, and no evidence of any hitherto obscure subdivision. The item most correlated with all others turned out to be hammering, with writing only just behind.

"The analysis was an important stage in the development of my Right Shift Theory,³ since it convinced me that hand preferences are distributed continuously, and it led to the discovery that the continuum of preference can be reliably coordinated with the continuum differences between the hands in skill. The coordination, first demonstrated in the cited paper, was confirmed in later work, and is the foundation of several further discoveries, summarized in a book just completed.⁴

"The paper is most often cited for its appendix, the questionnaire. It is occasionally cited as evidence for the continuity of the hand preference distribution, but this uncomfortable fact is still not accommodated in most current approaches to laterality."

1. Williams W T & Lambert J M. Multivariate methods in plant ecology. I. Association-analysis in plant communities. *J. Ecology* 47:83-101, 1959.
2. Williams W T. Citation Classic. Commentary on *J. Ecology* 47:83-101, 1959. *Current Contents/Agriculture, Biology & Environmental Sciences* 13(16):16, 19 April 1982.
3. Annett M. The distribution of manual asymmetry. *Brit. J. Psychol.* 63:343-58, 1972. (Cited 100 times.)
4. *Left, right, hand and brain: the Right Shift Theory*. Submitted for publication.