

# Editorial

From the beginning, and one can go back as far as the work of Francis Galton of London, research in gerontology has been influenced by quantitative methodology which tries to measure, quantify and objectify constructs. Quantitative methodology has always been a favoured approach in gerontological research. Generally, successful research has not been de facto the result of the decision to adopt quantitative methodology. Many examples of early research in aging – and these comments apply also to contemporary studies – have methodological deficiencies which are sufficiently significant to invalidate the results and therefore the conclusions of the research. Research in gerontology, having no witness group, has often had recourse to inappropriate methods: for example, using cross-sectional design to study the effects of aging, while estimating the effects of cohorts, and relying on a limited number of subjects, the selection of whom has been dubious; not sufficiently taking into account conflicting variables; considering the elderly as a perfectly homogeneous group; using variables and measures chosen originally for use with young adults and statistical analysis inappropriate to the questions being studied. These methodological deficiencies bring into question the internal and external validity of these studies and were considered sufficiently important and prevalent to be documented (e.g., Maddox & Campbell, 1985; Schaie, Campbell, Meredith, & Rawlings, 1988) so that researchers could adopt a more rigorous methodology.

These methodological questions are important when evaluating the significance of a research project or the value of the results. As this field of study has developed, major improvements have taken place. However, certain methodological deficiencies are still found too frequently today. New problems have also arisen as research in aging uses more and more complex rules and refined methods. It is important to document these deficiencies more thoroughly and better methods of analysis need to be developed to produce higher quality research. The six articles in this special issue of the *Canadian Journal on Aging* on quantitative methodology each consider one particular aspect of the subject. However, this special issue does not attempt in any way to offer global coverage of the topic.

From the beginning, research on aging has faced a fundamental problem – quantifying the constructs which are essential to this area of study, not to mention the difficulty of defining them. Since this is a fundamental problem, it is not surprising that three of the six articles in this special issue deal with this question. Réjean Hébert, Gina Bravo and Louis Voyer, in the only French article in the issue, give us a pertinent reminder that several options are available. These options are, however, not all equally valuable. In many cases, researchers have unfortunately used constructs and measures designed for use with a population of young adults. We should question this practice, except in cases where researchers have from the start demon-

strated that these measures are appropriate. For example, in the case of depression, it is clear that the Beck Depression Inventory (Beck, Rush, Shaw, & Emery, 1979) has been used frequently in work relating to the elderly. There was no proof that this measure was reliable or valid for the study of this age group. We had to wait for the research of Gallagher, Nies and Thompson (1982) to confirm that this instrument retained these psychometrics qualities despite the fact that the Beck Depression Inventory was not conceived or validated for the elderly. Generally, as we shall see, results are not equally good, since researchers have used methods inappropriate for research on the elderly. A second option is to develop constructs and measures specifically for the elderly. This option, although desirable, may under certain conditions prove long and tedious, not to mention the fact that it may not be possible to compare results obtained in this way with those of previous studies. Moreover, there is a real danger of proliferation of instruments of measurement. This last comment does not imply, however, that researchers should be restricted to existing measures, especially as many owe their *raison d'être* to the fact that they are frequently used. Frequency of use should not discourage researchers from developing more appropriate methods. The third option would be to use already existing instruments of measurement but to ensure their accuracy and validity. On this last point, it is important to make sure that an instrument measures effectively the construct which it claims to measure. Two articles address this question.

In their article Lynn Kelly, Jane Know and William Gekoski remind us of the existence of a problem in measuring the concept of locus of control. Among the many available instruments, many of which were not set up for use with the elderly, is the Desired Control Measure of Reid and Ziegler (1980). According to the authors, it is not clear whether this instrument effectively measures locus of control. Since up till now there has been no attempt to establish a link between this instrument and other validated measures of locus of control, it was not possible to determine the validity of this instrument. After comparison with Levinson's three dimensional scale, the authors conclude that the Desired Control Measure does not measure locus of control but perhaps another construct, that is self-satisfaction. In their article, Barbara Collins and Andrée Tellier note that the existing measures for evaluating conceptual flexibility, such as the VVT index, are not all necessarily appropriate for use with the elderly. Their aim is to derive a new index from the VVT and to specifically validate it for the elderly by relating it to another external criterion. The authors show that the original VVT index is not an adequate measure of flexibility. These articles by Kelly, Know and Gekoski, and by Collins and Tellier clearly show the problem of measuring constructs which are specific to the elderly, and the necessity of verifying empirically the correctness of the instruments available for work with this group.

These problems of measurement take on a particular dimension for researchers in the French language. If it is questionable whether an instrument designed for research on young adults should be used for research on

the elderly, it is doubly questionable whether an instrument designed for research on anglophones should be used for francophones. Hébert, Bravo and Voyer, in their article, come up against this problem and propose systematic steps for translating an instrument in gerontology. The steps proposed involve the selection of the most accurate instrument in the English language, its translation into French and back into English, a review of the translations by a committee, a pretest, and examination of the fidelity of the test, and further testing and retesting. Hébert, Bravo and Voyer's article has the merit of permitting the French researcher to work in his own milieu and of obtaining an instrument which is valid for use with an aging population.

The last three articles which make up the special issue consider other aspects of quantitative methodology. Although research in gerontology is a relatively recent development, certain aspects have been the subject of numerous studies. The difficulty which emerges is to decide if the knowledge accumulated is sufficient for us to draw an adequate conclusion for a given phenomenon. The traditional method is to prepare a survey of the studies, generally in the form of a review of the literature. Pierre Foisy considers such a review, although necessary, to be of limited value since authors generally are content with listing studies which either support or reject a phenomenon under study. It is clear that the quality of studies reviewed varies and the studies have differing statistical significance. To ignore this fact would lead to invalid conclusions, according to Foisy.

Foisy considers that meta-analysis allows us to take into account the disparities between studies and constitutes the best method when making a synthesis of studies on a particular theme. He uses meta-analysis to estimate the effect of aging on intentional memory for spatial locations in small-scale space. Although the results of this study appear to demonstrate that with advancing age that type of memory diminishes, Foisy recalls that several conflicting variables which were not controlled for could explain these results. He suggests that future research in this area of spatial memory should take into account these exogenous variables, such as level of education, general intellectual performance and visual acuity.

John Hirdes and Stephen Brown note that an important development in quantitative research has been an increase in the use of longitudinal studies to examine physical, psychological and social changes in the process of aging. Despite the significant costs of these studies, there are about 30 longitudinal studies either completed or shortly to be completed. When the time comes to estimate the effects of aging, it is preferable to use longitudinal studies since transverse studies, which are frequently used, estimate the differences in cohorts rather than changes attributable to aging. Aside from the costs associated with this kind of research, researchers face specific statistical problems, for example, how to treat such a complex body of facts. Moreover, longitudinal studies are characterized by heightened attrition since some subjects die during the course of a study, others cannot be contacted or are no longer interested in participating. This article proposes a

novel statistical approach for analysing longitudinal facts and in particular offers a way of treating the facts following attrition of subjects.

Over the years, researchers have operationalized new variables in an attempt to explain phenomena associated with aging. For example, recently an extensive literature has appeared on a new problem – the burden of caregiving. Numerous studies have tried to document the results for caregivers of caring for an aged person who is suffering from lack of autonomy or dementia, as well as to find the variables most often associated with this burden. Generally, the explanations remain incomplete. Researchers have been led to look for other explanatory variables. In the case of the care burden, one of these new variables is composed of the positive effects associated with the task of caregiving. In the last article in this issue, Carole Cohen and colleagues, after reviewing the differing concepts and measures associated with these positive effects, describe a single measure of satisfaction with caregiving. In the opinion of the authors, the positive aspects of caregiving must be better documented in order to obtain a greater understanding of this problem. This call for a search for or development of new variables will no doubt have a favourable spinoff in other areas of research in gerontology.

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