

BOOK REVIEW

Review by Dr. Barry Richardson,
Associate Professor of Psychology,
University of Papua New Guinea.

Cross Cultural Studies in Cognition And Mathematics

David F. Lancy,
Academic Press, 1983.

David Lancy's book is highly readable. It is also informative. It is based on the "indigenous Mathematics Project" the bulk of which ran from 1977 to 1979 in Papua New Guinea. In those two years, Dr. Lancy and a team of researchers collected voluminous data from 10 selected sites in Papua New Guinea and the results come together in this important book.

Its importance is threefold. Firstly, it cannot fail to be of interest to educationists, sociologists, psychologists, and anthropologists. Such claims are often made but this one is true! Secondly, it describes research which is well conceived (in that qualitative data are well supported with real numbers) yet undeniably relevant to education planning -- particularly in developing countries such as Papua New Guinea. Thirdly, I think it demonstrates how disciplines such as those listed above have no real boundaries separating them and that a non-shallow treatment of a topic in one, will have to take account of the others.

Lancy interweaves theories and ideas from well known researchers and applies these ideas to the results of his data. For example, he looks at Piaget's developmental stages in some detail and neatly identifies the strengths and weaknesses therein by reference to his own data and those quite remote from cognition.

Lancy shows admirable sensitivity to an issue still very much alive in Papua New Guinea. The issue is what to do about "standards" in Papua New Guinea. Extremists on one side complain that Papua New Guinean students just don't think or don't work hard enough or just don't have any ability and those on the other side say that we must lower our sights, make allowances for second language problems, and forget Western standards; the tough guy vs bleeding heart dichotomy. Lancy supports a little bit of both viewpoints by finding fault with those who reject Western culture with trendy platitudes about preservation of culture. At the same time, he is critical of the PNG education system's goals (in-so-far as they are known) and methods. His criticisms are mostly well reasoned arguments supported by data.

At times, I felt that Lancy was in danger of suggesting that we should accept a new view of human cognition on the basis of data which really only support a modified view. Acknowledging that earlier theories tend to ignore the enormous influence of culture does not mean that the way Papua New Guineans think should become the focus of a new theory, particularly given the admittedly interesting but remote sample sites chosen by Lancy.

Chapter 2 -- The Digging Stick, the Steel Ax, and the Calculator -- describes the ten sites and gives a brief history of people and a sketch of contemporary life. The maps and photographs provide a welcome point of contact with the people rather than the "subjects".

The following chapters deal with the research rationale and data collection but they are not dry reading. The counting systems described in Chapter 5 are fascinating, as are the descriptions of children's games but more importantly, Lancy reports that 75% of these games focus on physical skills and 25% on fantasy and discovery. None appear to encourage strategy or probabilistic reasoning.

Such cultural differences between PNG and the Western world (and many others are reported) suggest something like a different "wiring up" of the brain as a consequence of activities during what Lancy calls Stage II. This stage roughly corresponds to Piaget's concrete operations stage and Lancy's Stage I, with Piaget's sensorimotor and preoperational stage. Like Piaget, Lancy suggests that stage I development is relatively unaffected by culture (though many would dispute this).

The suggestion that Stage II development is very much affected by culture is extremely important and received less

attention than it deserved. The principle of critical periods during which specific kinds of stimulation must be present for exploitation of potential are well known in animal studies but less well defined in humans. Lancy's data point to parallels in human cognitive development which were sufficient for more confident conclusions and recommendations than those made. Interestingly, he notes that paucity of challenge and variety (particularly in Stage II) seems to lead to poor cognitive performance in later years (by Western standards) but implies that "extra steps" in the PNG education system can compensate for what has been missed (p.204). Such an idea, if acted upon would require several years of schooling beyond that regarded as normal. There is not time for these "extra steps" in PNG is to keep pace with other countries (which of course, it can decide not to do) if such a strategy focuses on the wrong end of the education process anyway. If anything comes out clearly, it is that education must start earlier, whatever the aim and content.

In a concluding paragraph, Lancy says that Sir Julius Han's "There's no 'Melanesian Way' to pilot a plane" quote, meant that "... many aspects of Papua New Guinea's traditional cultures can and should be integrated into national life, but to the extent that this national life includes Western technology, the country must adopt the forms of education and cognition that go along with it" (p.210).

It is a pity that Westerners know more about planes and how to pilot them than they do about how to teach non-Westerners about such things. Lancy's work represents a significant step towards the reduction of Western ignorance which, regrettably, appears to be necessary before we can expect similar "progress" in Papua New Guineans.