

# The value of European and African institutional partnerships in applied sport management research. The case of head load carrying by African Xhosa females

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## Aim of paper

In this case the Sport Programmes at the University of Abertay, Scotland, UK and the Cape Peninsula University of Technology, South Africa collaborated on a research project whose aim was to focus on the physiological, biomechanical and perceptual factors that impact on African Xhosa females during head load carrying, as well to test the 'free ride' hypothesis, that suggests head loading is more efficient method than back loading, and test these two conditions in two groups of women who differed only in their experience of head load carriage.

## Research questions

Academic and research partnerships between European and African universities have the potential to make profound contributions to knowledge creation, along with skills and capacity development. This is most apparent when diverse expertise can be focused on a meaningful applied research project that seeks to answer questions that are unanswered or where previous studies were arguably limited and the results questionable. In many parts of the world, including Africa, South America and Asia, heavy loads are regularly carried on the head by females, however what little research has been done on this phenomenon has used small subject numbers, and many of the results appear to be contradictory.

## Literature review

For a variety of reasons (historical, economic, and cultural) relatively heavy loads are carried predominantly by females on the head in much of the developing world. In particular, women across Africa regularly employ some form of head load carriage, to transport essential items such as water, firewood and general necessities for daily living. The practice of head load carrying by African females is currently being challenged at Government level in South Africa, based on the possibility of perceived harm to the individual. This view was stated at the First International African Conference on Gender, Transport and Development 2006, which declared: "Head-load carrying is detrimental to health"; although this position statement was not based on known scientific evidence.

It has been suggested, however, that the head load method of load carriage is particularly efficient, and the so called 'free ride' hypothesis has been proposed indicating that African women can carry loads up to 20% of body mass with no additional energy cost Maloiy et al. (1986), Charteris et al. (1989a; 1989b). This data is somewhat contradictory and confounded by very small sample sizes. On the one hand Maloiy et al. (1986), Charteris et al. (1989a; 1989b), and Nag and Sen (1978) have all presented data, based on samples of 4-6 participants,

suggesting that head-loading is an extremely efficient method of load carriage whilst on the other hand Datta and Ramanathan (1971) have argued, based on 6 participants, that it is less efficient than back-loading. It was of concern that the participant numbers for these studies was small, and thus the extrapolation of these findings to broader populations questionable and unverified.

### **Research design and proposed data analysis**

Thirty two Xhosa women, thirteen with at least ten years experience of head load carriage (EXP) eleven with no experience of head load carriage (NON) and eight with some experience in childhood but no recent experience (INT), were recruited to take part in the study. The participants walked on a treadmill at a self selected walking speed, based on an habituation session during which the women accustomed themselves to treadmill walking, carrying loads in two different conditions, either in a basket on their head or in a backpack.

All participants gave informed consent for their participation in the study which had received ethical approval through standard institutional review procedures at both the University of Abertay Dundee and Cape Peninsula University of Technology.

### **Discussion of progress**

Due to the shortcomings of previous studies and the need to address broader issues regarding women, an international institutional research collaboration was implemented, that emphasised project planning, process management and communication, underpinned by a memorandum of understanding. Initial outputs indicate that with more robust participant numbers, and more reliable technology that head loading on Xhosa females results in higher energy cost when compared to back loading. The present study indicates that, on average: the relative economy of head load carriage in these African women is much less than previously reported, there appears to be no physiological advantage to head load carrying over back loading, that back-loading shows some tendency to be more economical, that very few women could carry very heavy loads on their heads and that greater loads could be carried on the back than on the head.

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