Cultural Independence of Mathematics: A Fact or A Myth?

Smita Sirker
Department of Philosophy
& School of Cognitive Science
Jadavpur University

When pursuit of some branch of knowledge stems from the lived life of a society or community, then there are bound to be some cross-fertilisation between the subject and the society. All human communities have expressions in songs and dances but each community sings and dances differently. In case of ancient mathematical practices, Wilder says that "The direction that mathematics takes in a culture is guided by the cultural needs or attributes – religious, philosophical, agricultural, navigational, industrial as well as mathematical – of the culture. The different directions taken by Greek and Chinese mathematics were determined by the primitive cultural conditions prevailing in these cultures during their prehistoric periods." [*Introduction to the Foundation of Mathematics*, p.296] In ancient, even medieval Indian society, mathematics was never considered as a purely abstract, esoteric enterprise. In Western tradition, mathematics emerged as an abstract discipline during the time of Plato via the Pythagoreans.

Bishop remarked "Mathematical ideas, like any other ideas, are humanly constructed. They have a cultural history" ['Western Mathematics: The Secret Weapon of Cultural Imperialism', p.52]. Diversification in mathematics suggests not only variations in the development of mathematical theories, but also diverse patterns of thinking involved in nurturing and developing these systems. Disagreements emerge when one of the reasons for such diversification suggests cultural differences, because mathematics has been viewed as same across all cultures. Researchers have long been interested to find out whether people across cultures and across different backgrounds share the same cognitive patterns of thought and reasoning. The question is, if cognitive differences are present in ways people across cultures form their world-view, then will the development of mathematics across cultures and even across social groups be the same? If the initial development of mathematics is motivated from the needs and functions of a society, then can mathematics grow in isolation, without any impact from the socio-cultural aspects of the community? Bishop says "… it is now possible to put forward the thesis that all cultures have generated mathematical ideas, just as all cultures have generated language, religion, morals, customs and kinship systems. Mathematics is now starting to be understood as a pan-cultural phenomenon" [2, p.53]. Empirical studies (Nisbett & Cheng; Luria; Cole & Scribner) across different groups (inter-culture, intra-culture, inter-society) have revealed the presence of cognitive differences in terms of: Categorisation and abstraction of the world; (ii) Geometric shape perception; (iii) Deduction and Inference; and (iv) Reasoning and problem solving.

In this presentation, I will try to discuss some of the cultural variations that emerge in the different cognitive tasks performed by people in different cultures.