

The University of Hong Kong
Department of Psychology

Departmental Seminar

***Frames of Reference in Spatial Cognition: Effects of
Sensory Inputs and Environmental Characteristics***

Date: May 9, 2014 (Friday)
Time: 3:00 p.m. – 4:00 p.m.
Venue: Room 8.13, 8/F The Jockey Club Tower, Centennial Campus,
HKU
Speaker: Dr. George S. W. Chan
McMaster University

Previous human behavioural research has provided support for the existence of different frames of reference utilized during spatial processing that can be dependent or independent of the observer. These are known respectively as egocentric and allocentric frames of reference. However, it has been difficult to dissociate these two different processes under realistic conditions. Importantly, how these frames of reference are specifically influenced by visual and non-visual information is not well understood. Therefore, we have now conducted several studies to evaluate spatial processing utilizing realistic and ecologically valid stimuli in environments of different scales, while systematically manipulating the visual and non-visual information available during learning. We demonstrated that non-visual information generated by actively walking through an environment leads to more egocentric processing, whereas the same visual motion information presented passively via video leads to more allocentric processing. Further, characteristics of the visual scene can also influence spatial processing. For instance, spatial information is encoded differently depending on the strength of the verbal identity of the features in the environment. Specifically, in a small room environment subjects' representations of corners (no clear verbal identity) were not

as strongly encoded relative to each other in comparison to familiar objects (clear verbal identity). Finally, we demonstrated differential influences of non-visual information dependent on whether the features in the visual scene were more allocentrically processed or egocentrically processed. Specifically, when features of object layouts were distinguishable by their identity, this led to more allocentric processing, whereas when features of object layouts were distinguishable by their relative position, this led to more egocentric processing. Further, non-visual information made available during spatial updating when the observer was changing viewpoints benefitted tasks focused on differentiating changes to objects' identity and less so for differentiating changes in relative object position.

