

學生：戴聞      指導老師：黃從仁

標題：Interactions between Statistical Summary Perception and Statistical Learning: A Computational Model

摘要：

To efficiently process overwhelming information from viewing, human visual system can not only compute summary statistics of a scene (e.g., mean size of objects) but also learn statistical regularities in that scene. However, these two automatic, statistical processes have been reported to interfere each other (Zhao, Ngo, McKendrick, & Turk-Browne, 2011, Psychological Science) and the cause of such an interference is not entirely clear yet. Here we propose that the observed interference is resulted from a conflict between relatively distributed spatial attention demanded by statistical summary perception and relatively localized spatial attention demanded by statistical learning. We implemented a computational model to illustrate that distributed attention for statistical summary perception could impair statistical learning of local regularities, which, once learned, could capture attention and thus bias estimates of global summary statistics incorrectly toward local statistics. Our computer simulations successfully replicated findings in the statistical learning literature and various mutual interference phenomena reported by Zhao et al. (2011). The proposed model offers insight into how attention may mediate both statistical processes and provides several experimentally testable predictions, such as no interference between statistical summary perception and statistical learning of global scene regularities.