ting of the oculo-motor system leading to an improvement in high-order visuo-spatial representation able to ameliorate neglect.

B19

INTERHEMISPHERIC COLLABORATION: EFFECTS OF MIXING STIMULUS FORMAT *Urvi Patel, Joseph Hellige; University of Southern California* – The present research examined the effects of mixing stimulus format on interhemispheric collaboration. Observers were presented with three stimuli, two located above the point of eye fixation (one to each visual field) and the third located below the point of fixation (to one visual field). Observers indicated whether the bottom stimulus represented the same numeric quantity as either of the top two stimuli. In the digits only condition, all three stimuli were digits and in the dots only condition, all three stimuli were dice-like dot patterns. In the mixed format condition, two digits appeared in the upper locations and a dot pattern appeared in the lower location. In order to compare the benefits and costs of distributing information across the two hemispheres, the critical comparison involved trials on which the two matching stimuli project to the same visual field (within-hemisphere trials) versus trials on which the two matching stimuli project to opposite visual fields (between-hemisphere trials). For both reaction time and error rates there was a within hemisphere advantage for the digits only condition and for the mixed format condition, despite the fact that this task could not be performed on the basis of physical identity. In contrast, there was a between hemisphere advantage for the dots only condition, despite the fact that this task could be performed on the basis of physical identity. This pattern of results indicates that the benefits of spreading processing across both hemispheres do not necessarily increase as the task becomes more complex or demanding.

B21

CONTINUOUS FLASH SUPPRESSION: STRONG DICHOPTIC MASKING CAN REDUCES NEGATIVE AFTERIMAGE *Naotsugu Tsuchiya, Christof Koch; California Institute of Technology* – Visual illusions that produce perceptual suppression despite constant retinal input, such as masking, binocular rivalry, and flash suppression, are used to study the neuronal correlates of consciousness. Here we report on a novel perceptual suppression technique, continuous flash suppression (CFS): continuously flashing different images at around 10Hz into one eye can suppress a constant image presented to the other eye in a reliable and sustained manner. Unlike flash suppression, it does not require pre-exposure of the target stimuli to achieve reliable disappearance, making CFS attractive for studies that require complete unawareness of the target. First, we compared the mean initial suppression duration without pre-exposure of the target (n=17) using binocular rivalry and CFS. The suppression lasted only 4.3 sec in binocular rivalry, while it was prolonged into 56.0 sec in CFS, increase of more than 10-fold. Using this tool, we re-examined the question of the neuronal sites underlying the perception of negative afterimages. Though it is widely believed that afterimages originate among retinal neurons, we show that the subjective rating of strength of the afterimages of colored isoluminant Gabor patches was reduced almost by half when the inducing image was masked with CFS (but was physically present throughout the adaptation period on the retina). Further experiments showed that the stronger the suppression of the adapting stimuli, the larger the reduction of afterimage intensity. Our results imply that the representation of negative afterimages must involve structures that have access to input from both eyes.

B23

PARIETAL MEDIATION OF ATTENTIONAL SELECTION IN COMPETITIVE VISUAL DISPLAYS *Jason Mattingley, Christopher Chambers, Natasha Janko, Mark Stokes; School of Behavioural Science* – Typical visual scenes contain more information than can be used to guide behaviour. Mechanisms of selective attention enhance neural processing of the most relevant stimuli, while simultaneously suppressing distracting information. Multiple lines of evidence suggest that the human parietal cortex is vital for attentional control, but the role of specific subregions in mediating competitive selection is unclear. The present study used transcranial magnetic stimulation (TMS) to determine the role of the inferior and superior parietal cortex in visual selective attention. Participants undertook a localization task in which a visual target could occur alone or with competing distractors in the opposite hemifield. Event-related TMS was delivered during the first 300ms of target processing, over the superior parietal lobule (SPL), angular gyrus (AG) or supramarginal gyrus (SMG) of the right hemisphere. Results indicated that disruption of the SPL and SMG reduced attentional competition. Specifically, TMS of these regions 120ms after target onset improved perception of targets in the right hemifield, but only when the targets occurred with contralateral distractors. These results indicate that TMS selectively impaired distractor processing, thus reducing attentional competition between visual representations. The early involvement of the SPL and SMG places these regions in an ideal position to modulate sensory processing in visual cortex, thus determining which stimuli will win the competition for selection.

B25

DYNAMICS OF MOTION PERCEPTION IN OBJECT-SELECTIVE ATTENTION *Peng Wang, Zu Xiang Liu, Lin Chen; Key Lab of Cognitive Science, Graduate School & Institute of Biophysics, Chinese Academy of Sciences* – It was reported that when subjects attended to motion defined object, the attention effects to the irrelevant color in the object would activate the same area as the its sensory onset do, with a few tens of milliseconds lag (Schoenfeld et al., 2003). Then it would be interesting to investigate the reverse: when subjects were directed to attend objects cued by color, how are the dynamics of sensory onset and attention modulation of motion. In this study, subjects were directed to view a set of randomly distributed gratings and perform a task related to their color, when event related potentials (ERP) were recorded. The gratings may be stationary or moving in various trials. The result from nine subjects showed that the temporal relationship between sensory onset and attention modulation of motion was similar as color, but differed in span. Dipole fitting suggested the anatomical sensory-attention relationship in motion was not same as color, which still need to be confirmed by further MRI test. Acknowledgement: This work was supported in part by the Ministry of Science and Technology of China (2004CB318101) and the Chinese Academy of Sciences (KGCX2-SW-101). Reference: Schoenfeld, M. A., Tempelmann, C., Martinez, A., Hopf, J. M., Sattler, C., Heinze, H. J., et al. (2003). Dynamics of feature binding during object-selective attention. Proc Natl Acad Sci U S A, 100(20), 11806-11811.

B27

COLOR SINGLETONS DISRUPT THE PREVIEW BENEFIT OF VISUAL MARKING *Yong Bu[1], Qi Zhu[2], Ke Zhou[1], Jia Liu[1]; [1]The Key Lab of Cognitive Science, Graduate School & Institute of Biophysics, Chinese Academy of Science, [2]Department of Psychology, Beijing University* – If a subset of distractors is previewed before the target and the remaining distractors, search efficiency is greatly improved. The process that eliminates old items from search is called visual marking. Recent studies show that the color change of old items impairs the preview benefit, suggesting that the inhibition on the location of old items can be overridden by bottom-up visual changes. Here we ask whether bottom-up visual changes occurring at an un-marked location can disrupt visual marking as well. To answer this question, we orthogonally manipulated locations where bottom-up changes could occur by either changing the color of all old items or changing the color of a new item (i.e. a color singleton) in a 2x2 design. Consistent with the previous reports, the reaction time was significant delayed when the color of old items changed, compared to when the color did not change. Further, the reaction time was significantly longer when a color singleton appeared, suggesting that the disruptive bottom-up visual changes are not necessarily location-specific. Most importantly, a significant two-way interaction of color change of old items by appearance of a color singleton revealed that when a color singleton was present, the color change of old items did not further disrupt