Our Speaker

Dr Jim Stone started his work at the University of Sheffield as a Research Fellow in 2000 after gaining a BSc in Psychology and Pharmacology and an MSc in Knowledge Based Systems. He became a Reader in Psychology in 2003. His principal interests are computational principles underpinning visual perception and the relationship between learning and evolution. He is the author of books such as ‘Seeing’ which he co-authored with John Frisby.

The Eye: An Un-Intelligent Design

Abstract: Charles Darwin described the eye as, “an organ of extreme perfection”, and when he considered how natural selection could have produced such a complex organ, he confessed to experiencing “a cold shudder”. However, even though the eye is almost perfect in some respects (i.e. transmission of Shannon information), the eye’s overall design is far from perfect. Specifically, these imperfections include a lousy lens, fuzzy focusing, risible resolution, thriftless photoreceptors, crummy colour focus (chromatic aberration), a blind spot, and a back-to-front retina. These imperfections will be briefly described, with an eye on just how intelligent the designer of such an instrument would have to be.
**Poster Abstracts:**

1: Title: How can the patient experience for nystagmus patients be improved? – a patient perspective  
Authors: Helen Griffiths, Anne Bjerre, Gemma Arblaster, Sophie Fox, Vienna-Jay Burchell, Faith Kerekes  
Academic Unit of Ophthalmology and Orthoptics, University of Sheffield, Sheffield.  

**Aim:** To present patient recommendations for improved care for nystagmus patients.  
**Methods:** Orthoptic students led discussions with nystagmus patients and their families at the Nystagmus Network open day were undertaken. Themes were identified for improved care and additional advice that would have, in the patient’s / carer’s view, increased the value of orthoptic input for nystagmus patients.  
**Results:** There was a general consensus that standardised information provided and improved care is needed. The following common themes were identified: Further information about the condition; likely difficulties to be faced at different ages; educational support and recommendation of support groups. Better communication and clinician awareness of impact on quality of life. It was established that a guide for student orthoptists and clinicians is required and is currently being produced.  
**Conclusion:** The importance of service users in the evaluation and development of services is highlighted by the results of this study.

2: Title: Living with nystagmus - the patient’s perspective.  
Authors: Arblaster GE, Griffiths HJ, Bjerre A, Coughlan A, Darley L, Gibbings N, Mather F, Mc Courtney R, OBriain F, Robertson D.  
Academic Unit of Ophthalmology and Orthoptics, University of Sheffield, Sheffield.  

**Aim:** To present patient reported information about living with nystagmus.  
**Methods:** Ten Orthoptic students and three Lecturers in Orthoptics, who are also practicing Orthoptists, attended the Nystagmus Network Open Day, 2015. Students and staff interacted with parents, families and people with nystagmus of a range of ages and discussed the issues they experienced relating to aspects of daily living. Information from the patient’s perspective was collated immediately afterwards and analysed for common themes.  
**Results:** When describing living with nystagmus and the difficulties they experienced with aspects of daily living, common themes were described by children and adults with nystagmus and their families. These themes were mobility and navigation, employment, social interactions, other people’s knowledge and understanding of nystagmus, technology, changes over time and confidence.  
**Conclusion:** Information from patients with nystagmus and from their families about how their daily life is affected by nystagmus can be helpful in identifying specific areas that may benefit from intervention and support. Issues that affect daily life are likely to change over time. Using technology can significantly improve the daily lives of patients with nystagmus.

3: Title: Changing depth cue reliance by playing videogames  
Authors: David Buckley, Philip A. Duke and Helen Davis  
Academic Unit of Ophthalmology & Orthoptics & School of Psychology, University of Leicester.  

We tested the cue reliance of regular videogame players (VGP, N=21) and those who do not play (NVGP, N=13). We used stimuli where stereo, texture and outline cues sometimes conflicted (Buckley & Frisby, 1993) and found VGP relied more on stereo cues in cue-conflict stimuli than NVGP. This finding seems counterintuitive, as videogames are rich in monocular not binocular depth cues. We then took a group of NVGP (N=14) and measured their cue reliance before and after playing videogames, one game was rich in monocular cues (QUAKE) the other was not (TETRIS). Games were played on a monitor at the same distance as the cue.
reliance test. We found that 30 minutes of playing either game changed the cue reliance in the
direction of VGPs. The cue content of the games appeared unimportant and we suggest the
changes are simply due to adaptations to the display distance. We discuss our findings in
context of Shah et al (2000) who found stereo cue reliance similar to our VGP group in
laparoscopic surgeons and Rosser et al (2012) who found improved performance on a
laparoscopic surgery trainer if preceded by 6 minutes of videogame play.

4: Title: Design and validation of a new portable crowded Lea number visual acuity test.
Authors: Adele Kirkland, Anne Bjerre

Aim: Validate a crowded Lea number test and compare to the crowded logMAR test.
Methods: A Lea number booklet was designed on the principle of the crowded logMAR test
comprising of 4 numbers within a crowding bar at each visual acuity (VA) level. Optotypes
ranged between 0.800 to -0.100 logMAR decreasing in 0.100 logMAR steps. 32 participants
(mean age 20.4±1.5 years) with no ocular disease had right and left VA randomly assessed
using the crowded Lea number and crowded logMAR tests at 3m on two separate visits without
refractive correction.
Results: Mean VA was significantly worse with crowded Lea numbers (p<0.0001) resembling a
mean difference of <4 optotypes. Test-retest variability was 0.270 and 0.234 logMAR for
crowded Lea number and crowded logMAR respectively. Coefficient of agreement between
tests was 0.185 logMAR.
Conclusion: Crowded Lea number test is repeatable and produced on average lower VA (< 1
line) than crowded logMAR.

5. Title: Retrospective review of occlusion treatment for intermittent exotropia
Authors: Lindsey Hughes, Gemma Arblaster
Sheffield Teaching Hospitals NHS Foundation Trust, Sheffield.

Aims: To evaluate the effect of occlusion treatment on the control of the intermittent exotropia
and identify common features that had a successful or unsuccessful outcome.

Methods: A retrospective case note review of all patients who had completed occlusion
treatment to try and improve the control of their intermittent exotropia was undertaken. Patient
demographic data was extracted. Patients were divided into a treatment success or failure
group. Success was defined as either an improvement in the control of the deviation on cover
test at near or distance, evidence of improved binocular function at near or distance, or parental
report of improved control of the deviation. The size of the primary position deviation was also
compared at near and distance.

Results: Twenty two subjects were included in the analysis, occlusion treatment was
successful in 17 patients and a failure in 5 patients. Clinical characteristics of both the success
and failure group are described. The outcome measures most commonly seen in the success
group was improved control on the distance cover test (65%), improved control on the near
cover test (59%), improved binocular functions at near (41%), improved binocular functions in
the distance and parental report of improvement (both 35%). If success was achieved in any of
the outcome measures at the final treatment visit this was maintained when occlusion treatment
was stopped and at the final visit (p<0.05). Those in the success group had a significant
reduction in their distance deviation (p<0.05) and no significant change in their near deviation.

Conclusion: Due to the small numbers in this study it is not yet possible to identify features that
predict a successful or unsuccessful outcome from occlusion treatment in intermittent exotropia.
Oclusion treatment can improve the control of intermittent exotropia and should be considered
as a conservative treatment option. For those that achieve success, it is maintained and the
distance angle of deviation is significantly reduced.
6. Title: Measuring the Near Point of Accommodation; Comparison of the Conventional and Modified Push-Up Methods.

Authors: Hareem Esmail, Gemma Arblaster

Academic Unit of Ophthalmology and Orthoptics, University of Sheffield.

Aims: To compare the conventional and modified methods of measuring the near point of accommodation subjectively with the RAF rule.

Methods: The near point of accommodation was measured subjectively three times using both the conventional method (clear to blur) and the modified method (blur to clear) in 32 participants. Monocular and binocular testing was performed and all testing was counterbalanced. Participants were divided into a naive and an expert group based on their experience of blur and clear. All participants were asked which end point they found easier to judge, either the clear target starting to blur (conventional method) or the blurred target becoming clear (modified method).

Results: The modified method of measuring the near point of accommodation subjectively using the RAF rule gave higher results, mean = 0.73cm, compared to the conventional method, meaning the near point was further away from the patient. This was statistically significant for monocular measurements (p<0.05), binocular measurements (p<0.001) and when all results were combined (p<0.01). The two methods had a high correlation and there was no difference between the standard deviation of the two methods (p>0.05). The near point of accommodation results for the naive and expert groups were not statistically significantly different (p>0.05), yet most participants found the end point of the test easier to judge with the modified method (blurred target becoming clear).

Conclusion: When measuring the near point of accommodation subjectively using the RAF rule, both the conventional and modified methods give a consistent measurement, which correlates with the results from the other method. However, the results will be different and the two methods shouldn’t be used interchangeably. Most participants found the end point of the test easier to judge when the blurred target was moved to become clear (modified method), regardless of their experience of clear and blur. This suggests that using the modified method when measuring the near point of accommodation with the RAF rule should be considered rather than the conventional method.