The University of Edinburgh  
SCHOOL OF PHILOSOPHY, PSYCHOLOGY  
& LANGUAGE SCIENCES  

PSYCHOLOGY FINAL HONOURS  
DISSERTATION SUGGESTED TOPICS 2015-16  

**Topic Selection**  
Please look at the list of supervisors with their suggested topics, and get in touch with the supervisor using the specified contact method, to discuss possible projects.  

In terms of the process, you will need to make a ranked list of your preferred supervisors, and then submit your rankings on-line, by a deadline of 24th April, 2015. You need to rank your first six choices from 1 to 6, via the following link:  

https://edinburghppls.qualtrics.com/SE/?SID=SV_0DN1S4yGlr5t0Gx  

Students may work together in pairs on any project, and are encouraged to do so, but only in exceptional circumstances should this number be exceeded. In recent years, almost 40% of projects have been based on the student's own idea rather than a staff member. However, as with literature reviews, make sure you are choosing a topic which a staff member is willing to supervise.  

Dr Patrick Sturt  
Psychology 4 Course Organiser  
March 2015  

**Supervisors (with maximum number of students in brackets)**  

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<tr>
<th>Supervisors</th>
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<td>Prof Sharon Abrahams</td>
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<td>Dr Bonnie Auyeung</td>
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<td>Dr Thomas Bak</td>
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<td>Prof Tim Bates</td>
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<td>Dr Tom Booth</td>
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<td>Prof Holly Branigan</td>
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<td>Dr Nicolas Chevalier</td>
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<td>Dr Martin Corley</td>
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<td>Prof Sergio Della Sala</td>
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<td>Dr Catharine Gale</td>
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<td>Prof Robert Logie</td>
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<td>Dr Stephen Loughnan (8)</td>
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<td>Dr Andrea Martin (4)</td>
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<td>Dr Adam Moore (8)</td>
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<td>Dr Hugh Rabagliati (6)</td>
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<td>Dr Richard Shillcock (4)</td>
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<td>Dr Patrick Sturt (8)</td>
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<td>Dr Alex Weiss (8)</td>
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Below are some suggested research topics for dissertation projects. I am willing to discuss other areas within my discipline of clinical neuropsychology with a particular focus on executive and memory functions and the effects of aging or neurodegenerative disease. The projects listed below investigate the effect of normal aging. Anyone wishing to undertake a patient group project would need to access this group (e.g. via voluntary centres) independently.

1. Social Scenarios Test: Relationship to Executive Functions
A number of neurodegenerative diseases present with deficits in social cognition and executive functions. However the relationship between these functions is still unresolved. In this study we will use a newly developed test of social cognition The Social Scenarios Test, which measures affective and cognitive theory of mind in addition to understanding of social norms. The relationship of performance on this test to executive functions will be explored in healthy young and older participants.

References:

2. Social Scenarios Test: Relationship to Personality.
The social scenarios test is a newly developed measure, which assesses cognitive and affective theory of mind and understanding of social norms. The relationship between personality and performance on measures of social cognition is under-investigated.

A recent study by Freeth, Bullock & Milne (2013) found a positive correlation between social anxiety and autistic traits in a healthy UK student population, however the study did not include an objective measure of social cognitive abilities. Here we assess the relationship of personality measures including the Autism Spectrum Quotient (AQ), Empathy Quotient (EQ) and a Social Anxiety Scale to performance on this test in healthy younger adults.

References:

3. The Edinburgh Cognitive and Behavioural ALS Screen (ECAS)
This project will investigate a newly developed cognitive screening test for patients with neurodegenerative disease. The screen is a brief 20 minute interview which assesses executive and language functions, fluency, memory and visuospatial functions. This project will investigate further developments of the screen. Projects may including validating a new IPAD version of the test, assessing ease of usage in clinicians, test-retest reliability or investigating the relationship between objective (ECAS performance) and subjective (how the participant perceived their performance) measures of cognitive performance.
1. The relationship between parental-child interactions and infant social cognition

2. The relationship between social and spatial development in infants

3. Examination of social versus non-social looking preferences and face scanning patterns in infants

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**Reference:**

**DR BONNIE AUYEUNG**
Email: bonnie.auyeung@ed.ac.uk
Contact method: By email.

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**1.** The relationship between parental-child interactions and infant social cognition

**2.** The relationship between social and spatial development in infants

**3.** Examination of social versus non-social looking preferences and face scanning patterns in infants

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**DR THOMAS BAK**
Email: thomas.bak@ed.ac.uk
Contact method: Unfortunately, due to a previously arranged talk in Dublin I will not be able to attend the meeting on 26 March. However, I would be delighted to discuss personally the details of the projects with potentially interested students. If you would like to learn more about the project, please email me and we can arrange a meeting.

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All three projects I am offering this year are related to a recent paper, which appeared in January 2015 in “Cognition” and is based on two previous Y4 projects:

**Reference:**

The paper traces changes in cognitive function in students between the first and the final year of their study and examines to what extent they could be related to the study topic and, in particular, to studying foreign languages. The three projects I envisage would extend the questions of the paper, adding new tests and new experimental groups.

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1. **Are the differences between Y1 and Y4 students due to the intellectual stimulation of being at the university of rather due to natural maturation of executive functions?**
To answer this question we need to examine a comparison group of the same age, which is not at the university.

2. **Could the effects observed in language students be due to the stimulating experience of a year abroad that most of them complete?**
To answer this question we can examine students before and after a year abroad (which can but does not have to be connected with using a foreign language) and a comparable group of students who do not go away.

3. **Can we detect any differences between different student and non-student groups on measures of social cognition and emotional intelligence?**
How do executive functions and social cognition relate to each other and to the topic of study?

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**PROF TIM BATES**
Email: tim.bates@ed.ac.uk
Contact method: Drop by (F23) or email to arrange a convenient time.

1. Is self-control a bone, a muscle, or a belief?
High self-control accounts for much of success, and low self-control for much regrettable failure.

We will compare limited resource (Baumeister 2012), mindset (Job, Dweck, & Walton, 2010) and trait (Conscientiousness & effortful persistence Roberts) models of self-control.

You can find the Baumeister and Job articles online. This website explains why researchers are trying to find ways to raise control levels.

http://www.heckmanequation.org/heckman-equation-slideshow

2. Testing the incremental mindset theory of IQ
Unlike Nobel prize winner James Henchman (above), Carol Dweck (1998) has suggested that IQ is radically manipulable, by priming beliefs.

The theory is highly influential (Google executive Eric Schmidt cites it). We will test how belief in improvability relates to IQ. Google scholar will link you into the citations of this study. Here’s a gentle introduction to the idea.

http://www.ted.com/talks/carol_dweck_the_power_of_believing_that_you_can_improve

3. Does wealth cause greed, or do cheats just lie about being wealthy?
While crime occurs more often among the poor, Piff etal (2012) recently reported a series of 6 studies all appearing to show that having money makes people into cheats (by causing greed). We will test replication of two or three of these simple studies.

Reference:

4. I am also open to projects on aesthetics or on genetics
We have resources for a wide range of twin studies: recent work includes optimism, g x SES effects on IQ, depression and conscientiousness, group favoritism, religion and IQ...).

DR TOM BOOTH
Email: tom.booth@ed.ac.uk
Contact method: Email to arrange an appointment to discuss projects.

The projects proposed cover the general research areas of psychometrics, cognitive aspects of survey responding, personality and criterion associations. There is some scope within these projects for students to add additional elements to the studies which they think will be of interest. Where possible, a guiding reference is provided and it is encouraged students have read this material prior to coming to discuss the projects. These projects are intended for students to work in pairs to collect data, but are broad enough to offer specific questions for individual write ups.

1. Personality and Criterion Outcomes: Are associations specific to the affective, behavioural, cognitive and desire (ABCD) content of items?
It has recently been suggested that, in the measurement of personality traits, more attention should be paid to the relative content of items in four areas; affective, behavioural, cognitive and desire. It has also been noted that, whilst theory might predict the relationships between...
personality traits and various outcomes should be present at a global level, some associations are very specific, going as far as being due to single items. This study would look to bridge these two ideas and ask how the criterion associations of personality traits are impacted by assessing personality using items designed and scored to represent the ABCD components. See:

2. Do you read what I read? A qualitative study of individuals understanding of questionnaire items and their response format.
The purpose of this study is to inform on how individuals understand self-report questionnaire items. The project will use “speak out loud” techniques and semi-structured interviews in an attempt to understand how individuals process the wording of items and the response scales used in survey research. We will focus on items common to personality questionnaires in particular, but also questions and response scales typical in health research. This study will draw on learning from an area of research known as cognitive aspects of survey methodology. See:

Reference:

3. Reading and Answering Questionnaires - Joint Project: Dr Martin Corley
This project will use eye-tracking methodology to investigate aspects of questionnaire responding, with respect to both the reading of items and the processing of response scales. There is scope within this broad topic for students to define their own projects. The project will be jointly supervised by Tom Booth and Martin Corley. We anticipate that two key focuses will be established, with a pair of students working on each; however there will be reasonable overlap in the collective project.

References:

4. Understanding response scales - Joint Project: Dr Alex Doumas
One of the most commonly used measures in psychological research is the rating scale (e.g., wherein one is asked to rate their experience on a scale of 1–7, or on a scale of not-frequently to frequently). Commonly these measures are treated as interval or ratio data for the purposes of analysis. This practice seems highly at odds with what we know about how humans represent magnitude. Specifically, human magnitude estimations seem logarithmic rather than linear. I am working with Tom Booth on a project to investigate human scale judgements.

5. Meta-analysis: Using ERPs to identify recollection and familiarity - Joint Project: Dr Alexa Morcom
When we recognise someone but cannot recall where or when we have met them, we are experiencing a nonspecific form of memory known as familiarity. Subjectively, this seems quite distinct from a vivid recollection of the previous event. But a central debate in the study of episodic memory in the last three decades has been whether these experiences are indeed based on two distinct underlying memory signals (1). Behavioural studies have been unable to adjudicate between dual- and single-process accounts, but growing acceptance of a dual process view is based on brain imaging evidence (1). Some of the most persuasive evidence comes from scalp-recorded event-related potentials (ERPs). ERPs to recognised items are typically more positive-going than ERPs to novel items, and familiarity is associated with positivity from 300 – 500 ms over the mid-frontal scalp, while recollection is associated with positivity from 500 – 800 ms over the left parietal scalp. These are widely
regarded as distinct neural signatures of recollection and familiarity and are also used as markers to detect occurrence of these processes. However, no meta-analysis has yet been done to establish the statistical consistency of these dissociable effects. You will conduct this meta-analysis. No previous experience of ERPs is required, nor of meta-analysis, but you should be comfortable with the statistical components of your courses so far and interested to learn something new (see 3 for a BPS ‘expert tutorial’ in meta-analysis).

References:
(Note: the implicit memory-related effect is a different one: focus on the familiarity- and recollection-related effects).

DR HOLLY BRANIGAN
Email: holly.branigan@ed.ac.uk
Contact method: By email.

1. Language imitation in young children's dialogue
Children's language development is affected by the language that they experience from their conversational partner, so that they tend to repeat the words and grammar that they hear. This tendency can be investigated to answer questions about children's syntactic representations (e.g., Messenger et al., 2012), but it could also be informative about the relationship between imitation and social factors (e.g., van Baaren et al., 2009). For example, language imitation may be related to a fundamental social drive for children to affiliate. Example projects in this strand include investigating whether children are more likely to imitate a partner when they have been primed with an affiliative goal (e.g., by seeing pictures that evoke affiliation) or when the partner is perceived to be more socially desirable. I am also happy to supervise other projects related to language processing (particularly language production) in children.

References:

2. Social modulation of language alignment
Human communication is inherently social, but psycholinguistic research has only recently started to consider the possible role of social factors in modulating language use. One interesting example is a study by Balcetis & Dale (2005) which found that social attitudes towards a conversational partner are powerful enough to modulate syntactic alignment, or the tendency to copy a partner's grammar, which has traditionally been considered to be automatic and independent from any social factors. Balcetis & Dale found that participants who interacted with a more likeable partner exhibited a bigger priming effect than those who interacted with a less likeable partner. Similarly, Branigan et al. (2011) showed that our perceptions about our conversational partner affects the extent to which we repeat their word choices (lexical alignment). Together, this evidence suggests that we are more likely to copy our partner if we have a positive social attitude towards them. In this project, we will investigate whether Balcetis & Dale's (2005) findings can be replicated and extended to lexical alignment.
3. How lexical imitation affects subjective ratings of interactions and conversational partners

Previous research suggests that the tendency to imitate each other serves as "social glue", fostering the formation of social bonds and priming prosocial attitudes and behaviours (Chartrand & Lakin, 2013). Interestingly, there is now evidence that convergence on language style leads to increased group cohesiveness and relationship stability (Ireland et al., 2011), while accent imitation increases positive attitudes towards an interlocutor (Adank et al., 2013). It is therefore possible that linguistic imitation plays an important role in establishing successful social interactions, and is a phenomenon more socially embedded than suggested by a mechanistic alignment account (Pickering & Garrod, 2004). In a recent study, we found that people who interacted with a partner that imitated their word use in a simple picture naming task rated the interaction as smoother. There was also an indication that participants liked their partner more, compared to the group where the partner did not imitate their word use (i.e., used different words). This project will examine whether these effects can be replicated and whether they are related to mood.

References:

DR NICOLAS CHEVALIER
Email: nicolas.chevalier@ed.ac.uk
Contact method: By email.

I am prepared to supervise projects investigating how children and adults regulate their thoughts and actions. Potential subjects include (but are not limited to) processing of environmental information to decide what to do; decision on how to best control thoughts and actions based on task demands and available means; how more efficient control may rely on less control engagement in some situations. Projects include child and/or adult participants; however, projects with children need to be started early. I'm happy to discuss related topics with motivated students. Interested students should contact me by email.

References:
1. Comprehension of disfluent speech

It’s been known for a while that when speakers hesitate, for example saying “um”, “er”, or “like”, listeners’ comprehension processes are affected: They seem to change their predictions of what will be said, and they are more likely to remember hearing words that follow disfluencies. However, to date, our understanding of exactly how disfluencies affect both the processing and the eventual comprehension of messages is incomplete. I’m interested in supervising projects on a range of topics to do with this area, including:

- The ways in which disfluencies affect attention, using techniques based on phonetic discrimination tasks;
- What exactly constitutes a “disfluency”, using eyetracking or other methodologies;
- What listeners think of disfluent speakers, using experimental “games”.

2. The “Little Voice Inside Your Head”

We all experience an inner voice, but what is its relationship to overt speech? One set of studies suggests that our inner voice is like an “underspecified version” of our overt speech, which lacks in phonetic detail. I’m not sure that’s true; but showing that it isn’t is a tricky proposition! If you fancy a challenge, this is for you: It will probably involve fiendishly complicated tongue-twisters.


3. Reading and Answering Questionnaires (joint topic with Dr Tom Booth)

This project will use eye-tracking methodology to investigate aspects of questionnaire responding, with respect to both the reading of items and the processing of response scales. There is scope within this broad topic for students to define their own projects. The project will be jointly supervised by Tom Booth and Martin Corley. We anticipate that two key focuses will be established, with a pair of students working on each; however there will be reasonable overlap in the collective project.
References:

PROF SERGIO DELLA SALA
Email: sergio@ed.ac.uk
Contact method: By email.

1. Students’ own ideas
In addition to the following topics, I will be happy to discuss students’ own ideas for projects related to cognitive or experimental neuropsychology.

2. Where do we sit on a train on an airplane? Exploring pseudoneglect in real world
Normal people tend to analyse the left side of space better than the right. We all seem to prefer the left hemi-space to the right as a result of a different distribution of spatial attention in our brain. This project is aimed at finding out whether or not this bias applies to everyday tasks, like choosing a seat on a train or on an airplane.

References:

3. Context dependency, cognitive load, and material specificity in retroactive interference
Interfering effect of later processing on recall is known as retroactive interference. Context dependency implies that material learned in one environment may be more difficult to recall in a different environment. Cognitive load refers to the different effect produced by relatively easy vs relatively difficult interfering tasks. Material specificity refers to the effects produced by the similarity between the to-be-remember material and the interfering material. The role of these variables on retroactive interference has been little explored. Aim of this project is to find out whether or not any of these variables plays any role in retroactive interference effect whether any of these variables interact with delay.

References:

4. Short-term memory binding
Humans use temporary binding skills to comply with a number of requirements in everyday life, for instance when trying to keep track of whether we have just taken the blue round pill or the green oval pill. In experimental setting, this ability to remember colour and shape combinations is compared with the ability to remember sets of individual features, like sets of colours or sets of shapes. Unlike associative memory tests that are often used in clinical assessment there is no learning involved; the integrated combinations of colours and shapes have to be remembered for only a few seconds, and then they are changed on the next trial. Short-term memory binding tasks proved exempt from an effect of healthy ageing but showed a clear and specific effect in some forms of dementia, like Alzheimer's disease. This makes them a suitable cognitive marker for pathological ageing. This project aims at exploring the cognitive underpinnings of short-term memory binding.

References:

DR ALEX DOUMAS
Email: alex.doumas@ed.ac.uk
Contact method: Phone (0131 651 1328)

My research is focused on answering the questions: How do humans represent information, and how do we learn these representations? Specifically, I am interested in how humans learn relational concepts (like above, chases, or ameliorates) from real world examples, how we represent these concepts, and how we use these concepts in the service of solving problems. Understanding how humans represent and reason using relations is important because relational thinking—thinking that is constrained by the relational roles that objects play rather than simply the features of those objects—is a fundamental component of human cognition (e.g., Gentner, 2003; Holyoak, 2012). In fact, the ability to learn and reason about relations might be the primary difference between human and non-human animal cognition (Penn et al., 2008). Because relational thinking is ubiquitous in human cognition, my research has important implications within the broad field of cognitive science, as well as psychology, and education.

I have three ongoing projects that students may become involved with.

1. I am primarily interested in how children learn relational concepts. My primary research goals are to investigate what kinds of relational concepts children at various ages know, and what kinds of training will help them learn relations earlier and use these concepts more efficiently.
One of the most commonly used measures in psychological research is the rating scale (e.g., wherein one is asked to rate their experience on a scale of 1-7, or on a scale of not-frequently to frequently). Commonly these measures are treated as interval or ratio data for the purposes of analysis. This practice seems highly at odds with what we know about how humans represent magnitude. Specifically, human magnitude estimations seem logarithmic rather than linear. I am working with Tom Booth on a project to investigate human scale judgements.

Finally, I am happy to supervise students on other projects related to learning relational concepts and using relational concepts to solve problems. I am also happy to consult on any topics related to developmental work or to computation. Please contact me if you have a project in mind.

DR CATHARINE GALE  
Email: cgal@staffmail.ed.ac.uk  
Contact method: Email is best as I am not in Edinburgh full-time.

Below are two suggested research topics for dissertation projects. Both involve secondary analysis of data obtained from the UK Data Archive. This means that students would not have to collect their own data. Secondary data analysis saves time, but also has the advantage that the datasets are often much larger and of far higher quality than an individual researcher could assemble on their own. There are many useful research skills to be gained from secondary data analysis, including management of large datasets.

1. Personality and cognitive decline  
There is evidence that people who are higher in neuroticism or lower in conscientiousness have an increased risk of developing dementia in later life. More is known about the relationship between personality traits and normal cognitive ageing in older people. This project would use data from the English Longitudinal Study of Ageing to: a) examine the cross-sectional relationship between the Big Five personality traits and cognitive function in people aged 50 and over, b) investigate whether any of those personality traits are associated with change in cognitive function over time, and c) explore potential explanations for any associations.

References:  

2. Psychological distress, socioeconomic status and risk of chronic disease  
People who score higher on measures of psychological distress tend to have a higher risk of dying prematurely. The reasons for this are not fully understood. There is some evidence that the adverse effects of psychological distress on physical health may be stronger in people who come from more socioeconomically disadvantaged backgrounds. This project would use data from Understanding Society, also known as the United Kingdom Household Longitudinal Study, to: a) examine the relationship between psychological distress, as measured by the General Health Questionnaire, and risk of developing chronic disease, such as cardiovascular disease, b) explore whether psychological distress has a more detrimental effect on disease risk in people from less advantaged socioeconomic backgrounds, and c) explore potential explanations for any associations.
Perceptual load in a tactile flanker task

In the tactile modality, the presence of tactile distractors can impair the detection and discrimination of tactile targets presented simultaneously (e.g. Evans & Craig, 1992; Soto-Faraco, Ronald, & Spence, 2004). In these studies, tactile stimuli (both target and distractors) were presented to both hands simultaneously. However, the mechanisms underlying within-hand and between-hand tactile selection might be different, given that a different pattern of tactile ERP modulations is obtained when the attentional selection is performed between the hands (c.f. Eimer & Forster, 2003a) or within the same hand (c.f. Eimer & Forster, 2003b). Aim of the present project is to investigate whether an analogous interference effect would emerge when target and distractors are presented to fingers of the same hand, establishing a within-hand tactile equivalent of the flanker task (Eriksen & Eriksen, 1974). Crucially, by manipulating the physical difference between the target and the distractors (high and low perceptual load conditions) it will be possible to evaluate whether the interference of incompatible distractors is reduced under high perceptual load condition, as postulated by the load theory of selective attention (Lavie, Hirst, de Fockert & Viding, 2004).

References:

Conflict monitoring across sensory modalities

The cognitive adaptation phenomenon can be observed in conflict tasks (Flanker task, Simon task, Stroop task) when the sequential analysis of trials is carried out (that is when the compatibility of both current and preceding trials are considered). Typically, the compatibility effect is reduced after the consecutive presentation of two incompatible trials (e.g. Gratton,
Coles, and Donchin, 1992). According to the response conflict monitoring hypothesis (Botvinick, Braver, Barch, Carter, and Cohen, 2001), the response conflict in the preceding trial elicit a stronger top-down control that improve performance in subsequent trials. The aim of this project is to test whether the mechanisms responsible for conflict monitoring operate in a supra-modal fashion, that is whether these conflict-adaptation effects will still be observed when stimuli of different sensory modalities are presented on successive trials.

References:

Space coding in touch
How do we code the location of a tactile stimulus that is presented to our body? While the primary somatosensory cortex encodes the location of a tactile stimulus on the skin surface independently of body location, higher level brain areas integrate this information with the location of the body in external space. Recent studies on tactile perception have shown that tactile stimuli are remapped from somatotopic to external space before they can be consciously perceived (Azanon & Soto-Faraco, 2008). However, little is known about the strength and characteristics of these reference frames. In this project, we will use the Simon task as a tool (Simon, 1969; for a recent review, see Hommel, 2010) to investigate the reference frames employed to encode tactile stimuli presented to our hands.

References

The effects of gaze and covert attention on tactile processing
When we direct our gaze to one of our hands (even when vision of the hand is prevented), the processing of tactile stimuli presented to the gazed hand is enhanced (Forster & Eimer, 2005). The effect of gaze on tactile processing is very similar to the ERP modulations of tactile stimuli that are usually found when participants covertly attend one of their hands while maintaining their gaze on a central fixation point. Furthermore, responses to tactile stimuli presented to the gazed hand are faster than those to the same tactile stimuli when presented to the other non gazed hand (c.f. Driver & Grossenbacher, 1996; Honoré, Bourdeaud'hui & Sparrow, 1989). The aim of this project is to systematically investigate the nature of this gaze effect and its links with covert tactile attention. Is the effect of gaze on tactile processing independent from endogenous attention? What happens when gaze and attention are simultaneously directed to different hands? Is the effect of gaze dependent on the availability of visual information (what happens when the hand is not visible?).

References:

PROF ROBERT LOGIE
1. Multiple cognitive subsystems
One view of cognition is that it comprises a general ability, as, for example, measured by intelligence tests, and that the overall capacity limit of this general ability varies from one person to another. Another view is that cognition comprises several different specific abilities, e.g. verbal, visual, spatial, motoric, learning, retrieval, planning, inhibition, task switching, reasoning, problem solving and doing two things at once. According to this view, each specific ability is supported by different overlapping networks in the brain, each of these abilities has its own capacity, and general cognitive ability is the sum of all of the individual specific capacities working together, with specific combinations of abilities selected according to the demands of a given task. This project will explore the relative merits of these contrasting views of human cognition.

References

2. Remembering to do things: Prospective Memory
Every memory function relies on remembering to carry out our intentions, whether it is to post a letter, meet a friend, turn up for a tutorial or take medicine. This ability is known as Prospective Memory. How we remember intentions at the appropriate time is not entirely understood, and it is known to decrease with age with laboratory tasks but not when tested in the home environment. This project would examine prospective memory in real and laboratory simulated prospective memory tasks, and could focus on healthy young adults, or compare different adult age groups.

References

3. Multitasking
The ability to plan and carry out multiple tasks, as well as to deal with interruptions is increasingly important in daily personal and working lives, yet there is poor understanding of how humans cope so well with multiple competing demands. This project will explore the aspects of cognition that are required for successful multitasking and whether continually swapping between different tasks is more or less effective than tackling and completing one task at a time.

References


4. Human and digital forgetting

Large capacity digital storage is becoming cheaper, and so people tend to store everything that they generate digitally, e.g. photos, texts, emails, and other personal information, and often do not edit or delete what is stored, regardless of whether the material is worth preserving or not. This means that messages, photos and text are stored that will never be used again, and it becomes increasingly difficult to find the item or information that we want to retrieve. This project will explore how people store and organise digital information, the solutions (if any) that they generate to manage the ever larger amounts of digital information that they accumulate daily, and how the use of external, digital storage affects the way that they use their biological memory abilities.

References


DR STEPHEN LOUGHAN

Email: steve.loughnan@staffmail.ed.ac.uk

Contact method: Email and I will set up a doodle poll to arrange a meeting.

I am interested to supervise projects on two broad topics: sexual objectification and income inequality.

1. Sexual objectification involves seeing or treating another person as if they were a sexual object and not a full human being. In recent years, researchers have looked at the 15 psychological processes and some of the consequences of being sexually objectified, as well as who engages in that objectification. Potential projects could examine why people objectify others, or the psychosocial consequences of being objectified.

2. Economic inequality is currently at historically high levels. The impact of inequality at a macro-social level is well documented. How this impacts our psychology however, is not. Potential projects would examine how inequality changes the way people think and feel in social situations.

References:


3. The relationship between people and animals is somewhat paradoxical; most of us report loving animals and eating animals. How do people psychologically negotiate this problem? How do they deal with the emotional conflict that can arise when thinking about their consumption behaviours? Potential projects could look at the emotional and cognitive factors at play when people eat meat and/or think about animals.

Reference:

**DR MICHELLE LUCIANO**

Email: michelle.luciano@ed.ac.uk

Contact method: By email

I am interested in the genetic and environmental determinants of behaviour and am willing to supervise any projects studying individual differences, particularly in the areas of cognition, personality, well-being and mood. I have previously supervised projects on, for instance, personality, diet, and eating behaviour, and mate selection. For those accessing existing data sets there will be an emphasis on more complex statistical modelling. Please get in touch to discuss your ideas or any coinciding interests and we can map out a project.

Potential project:
“Internet Addiction”: Can it be explained by endophenotypes of drug addiction? Impulsivity and sensation-seeking are key behavioural traits involved in the transition of drug use to drug addiction; neuroimaging studies show that these traits are related to dopamine dysfunction, brain metabolism and structure, and as such they are known as endophenotypes, i.e., they lie on the pathway between biological process and resulting behaviour (Jupp and Dalley, 2014). This project will examine whether endophenotypes for substance addiction are relevant to behavioural addiction, in this case, internet addiction, a relatively recently defined phenomenon that some argue should be considered a mental disorder, like gambling (Pies, 2009; Van Rooij and Prause, 2014). There is some evidence that shows impulsivity and executive dysfunction are characteristic of both internet addicts and alcohol dependent subjects (Zhou et al, 2014), suggesting similar neurobiological antecedents for both types of addiction. This study will examine this possibility in a population based sample, using pertinent endophenotypes of substance addiction and exploring various models of internet addiction. There is scope to extend the project to personality traits and/or other addictive behaviours.

Some References of Interest


Van Rooij, A.J., Prause, N. A critical review of “Internet addiction” criteria with suggestions


**DR ANDREA MARTIN**

Email: [andrea.martin@ed.ac.uk](mailto:andrea.martin@ed.ac.uk)

Contact method: By email:

1. **Memory during sentence comprehension and production**

Understanding a sentence often relies on forming dependencies between words and phrases that are separated in time and space by other words and phrases. This simple fact points to a crucial role of memory in sentence production and comprehension. Recent research in my lab has used event-related brain potentials (ERPs) to try to understand how representation formation during ongoing processing interacts with information that is already stored in memory. A Y4 dissertation project could carry out experiments that extend that research, or could use behavioural tasks to extend the paradigm to sentence production. If you are interested in carrying out an ERP study, a minimum of two students must work together to collect the data. Collecting ERP data will require solid commitment to the project, and you would benefit from starting as early as possible.

References:


2. **Memory during dialogue**

During dialogue, we form memories of what was said, but also of who said what. How do we keep similar information, especially when produced by different speakers, separate and accessible for future use? This project focuses on the methodological edge of psycholinguistic research with an aim to modify existing comprehension and production paradigms to study language behaviour between two people.

References:


**DR ADAM MOORE**

Email: [amoore23@staffmail.ed.ac.uk](mailto:amoore23@staffmail.ed.ac.uk)

Contact method: Direct email and then interview/discussion about interests, etc. if there are too many slotted for a particular project.

1. **The Role of Intelligence and Personality in the Foundations of Moral Intuition.**

This project examines whether or not individual differences in moral intuition, measured by the Moral Foundations Questionnaire, are predicted in theoretically meaningful ways from a combination of fluid intelligence, personality, and resistance to intuitive illusions.

References:

2. Working Memory Capacity and Fluency Effects: Is Subjective Difficulty Calibrated by Ability?

This project will investigate whether or not individual differences in working memory capacity predict susceptibility to fluency effects – the finding that making a task seem subjectively more difficult causes people to switch from System 1 to System 2 thinking, and conversely, that subjective feelings of ease lure people into using System 1 thinking to solve problems.

References:
Alter & Oppenheimer. (2008). Uniting the tribes of fluency to form a metacognitive nation. 
Kane & Engle. (2002). The role of prefrontal cortex in working-memory capacity, executive attention, and general fluid intelligence: An individual-differences perspective. 

3. Morality, Politics, and Intelligence.

This project investigates the extent to which individual differences explain political beliefs better than, or in addition to, political orientation, personality, and IQ.

References:
Huebner, Dwyer, & Hauser (2009). The role of emotion in moral psychology. 
*Personality and Individual Differences*, 50, 621-625.

DR ALEXA MORCOM
Email: alexa.morcom@ed.ac.uk
Contact method: By email

My main research interest is in memory: basic memory mechanisms, and how memory changes as we age. For more details see my website:

http://www.ppls.ed.ac.uk/people/alexa-morcom

In both areas of interest, projects are possible examining how episodic memory changes in ageing, or advancing understanding of how it works in young adults. Student input into the project topic is encouraged.
In general, it’s recommended you work with a dissertation partner. This is particularly important for projects on ageing, because of the greater demands in terms of data collection. Dissertation partners usually have different dissertation topics addressing related questions (e.g. one in young adults, one ageing project, or two related ageing projects).

1. Meta-analysis: Using ERPs to identify recollection and familiarity (co-supervised by Dr Tom Booth)
When we recognise someone but cannot recall where or when we have met them, we are experiencing a nonspecific form of memory known as familiarity. Subjectively, this seems quite distinct from a vivid recollection of the previous event. But a central debate in the study of episodic memory in the last three decades has been whether these experiences are indeed based on two distinct underlying memory signals (1). Behavioural studies have been unable to adjudicate between dual- and single-process accounts, but growing acceptance of a dual process view is based on brain imaging evidence (1). Some of the most persuasive evidence comes from scalp-recorded event-related potentials (ERPs). ERPs to recognised items are typically more positive-going than ERPs to novel items, and familiarity is associated with positivity from 300 – 500 ms over the mid-frontal scalp, while recollection is associated with positivity from 500 – 800 ms over the left parietal scalp. These are widely regarded as distinct neural signatures of recollection and familiarity and are also used as markers to detect occurrence of these processes. However, no meta-analysis has yet been done to establish the statistical consistency of these dissociable effects.
You will conduct this meta-analysis. No previous experience of ERPs is required, nor of meta-analysis, but you should be comfortable with the statistical components of your courses so far and interested to learn something new (see 3 for a BPS ‘expert tutorial’ in meta-analysis).

References

Episodic memory and episodic memory in ageing
Conscious long-term memory for specific events is one of the abilities most affected by ageing. Older adult’ episodic memory is characterised by problems remembering details and associations between items (2-5). Importantly, older people are prone not only to failing to remember unique events, but also to false memories, that is, mistakenly ‘remembering’ events that did not happen.

Background reference

Project 2. Controlled memory search
A little studied aspect of episodic memory is the search process – how do people retrieve the information they seek? Strategic aspects of memory function show a prominent decline in normal ageing and are thought to reflect a decline in executive function (see 4). But findings of studies of memory search have been mixed (5). Most such research has involved neuroimaging as memory search is difficult to study behaviourally (e.g. 5). We need to know how retrieval cues are processed before anything is retrieved. But Jacoby et al.’s (6) innovative ‘Memory for foils’ behavioural paradigm is an exception. Their findings, like our earlier ERP study (discussed in 5), suggested age-related differences that may contribute to the age-related decline in recollection and increase in false memory.
You will aim to replicate and extend Jacoby et al's (2005) study following 5. A novel manipulation would be to determine the impact of external cues as a form of environmental support (4). This will also tell us something interesting about memory cueing in healthy young adults.

References:

Project 3. Ageing, meaning and false memory.
Why do older adults mistake novel items for similar ones they have encountered before? A number of studies have shown that they over-use general gist information and under-use item-specific detail, for example recalling that they saw a cat but not its colour or type. This can be explained by failures to remember the detail and use it (with control) to oppose misleading gist (7). We recently replicated and extended earlier findings suggesting the semantic information plays a critical role (8). However it is still unclear whether older adults are vulnerable to meaning specifically, or whether their memories are less distinctive whatever dimension (conceptual, perceptual) is assessed.
Possible designs for this project are a) to examine false memory for pre-experimentally meaningless stimuli in young and older adults or b) examine interference from perceptual aspects of meaningful stimuli. It may also be helpful to control how much older and younger adults use explicit verbal labelling when encoding items (‘semantic categorisation’ – see 8).

References:

Project 4. ‘Environmental support’ of older adults’ memory using schemas
A major theory of cognitive ageing claims that ‘environmental support’ can help older adults’ episodic memory (see 4). But findings have been inconsistent regarding the benefits of support by strategic instruction (10). Recent work suggests that new events which are consistent with pre-existing knowledge may be easier to remember for older adults, giving rise to the concept of ‘schematic support’ (2). This means that prior knowledge is used to assist memory.
This project will follow up a previous Y4 dissertation project which aimed to extend Castel’s study (9) with an additional manipulation based on the SLIMM model of how schemas support memory in young adults (10). The results partially replicated those of Castel (9) and suggest a need for further work on older, and younger, adults’ memory for novel information. It may be of interest to determine whether older adults also pay a price for schematic support in terms of false memory based on gist (see Project 3).

References:

DR CANDICE MOREY
Email: cmorey@staffmail.ed.ac.uk
Contact method: Arrange meeting by email.

1. How do visual memories differ from acoustic memories?
When you hear words spoken and see objects in your environment, these pieces of information enter your mind via distinct perceptual systems, and can be mentally represented with visual or acoustic detail. How do memories coded as sounds and memories coded as pictures differ from each other? Most especially, are these sorts of memories vulnerable to interference from the same sources? I would be happy to talk with prospective students about various options for comparing visual and acoustic memories. Possible methods include analysis of accuracy and response time on memory tasks, along with analysis of eye movements. It is possible for your project to have a developmental component, comparing memory performance of young adults with memory performance in either healthy elderly or child participants.

References

2. How are visual and verbal details linked together?
It is frequently necessary to remember the association between pieces of information coming from two different sensory streams (e.g., the name that goes with a person you meet for the first time). How do these pieces of information become bound together, and how does this process differ when features are multi-modal (e.g., aural and visual) compared with uni-modal (e.g., two associated visual features)? Possible methods include analysis of accuracy and response time on memory tasks along with analysis of eye movements. It is possible for your project to have a developmental component, comparing memory performance of young adults with memory performance in either healthy elderly or child participants.

References

DR RENE MOTTUS
Email: rene.mottus@ed.ac.uk
Contact method: By email

1. Personality variation over time and physical exercise
Personality variation does not exist only between individuals but also within individuals over time and in relation to situational circumstances and individuals' activities. This project would attempt to capture daily variability in personality manifestations and link this with physical activity. Measurement would be based on smartphones.

Reference:

2. Personality variation over time and alcohol use
Personality variation does not exist only between individuals but also within individuals over
time and in relation to situational circumstances and individuals' activities. This project would attempt to capture daily variability in personality manifestations and link this with alcohol use. Measurement would be based on smartphones.

3. Age differences in personality variation
Personality variation does not exist only between individuals but also within individuals over time and in relation to situational circumstances and individuals' activities. One would expect, however, that within-individual variability decreases as people get older. This could at least partly be because people's environments become increasingly stable and more matched to their inherent dispositions. This study would attempt to investigate age-differences in within-individual personality variation. Daily variability in personality manifestations would be measured using smartphones.

References:

4. Personality variation among couples
Personality variation does not exist only between individuals but also within individuals over time and in relation to situational circumstances and individuals' activities. One hitherto unstudied question is whether personality variability is similar among people living together such as couples. Although couples' static personality trait-levels display only a small tendency of being similar, it seems possible that that their daily personality variations are at least to some extent synchronous. Daily variability in personality manifestations would be measured using smartphones.

References:

DR MANTE NIEUWLAND
E-mail: m.nieuwland@ed.ac.uk
Contact method: By email to set up an appointment.

I am prepared to supervise Final Honours projects investigating various aspects of sentence comprehension and sentence memory. In addition to the project proposals below, I am happy to supervise any other projects in the area of language comprehension if the project is interesting and feasible.

1. The role of temporal terms ('before', 'after') in sentence comprehension. Temporal terms allow people to describe events in a non-chronological order (Before Event2, Event1), but does this come at a cost? This project will examine sentence verification times and sentence memory for chronological and non-chronological sentences

Reference:

2. Do people need to belief a sentence in order to comprehend it? What is the role of sentence truth-value and sentence informativeness on memory?

References:


3. Understanding the meaning of pronouns (e.g., he/she) involves memory processes, given that pronouns refer back to previously mentioned entities.

This project will examine whether understanding the meaning of a pronoun has an effect on subsequent memory.

Reference:

DR ANTJE NUTHMANN
Email: Antje.Nuthmann@ed.ac.uk
Contact method: Via email to arrange a meeting; away 16 April - 21 April

My current research interests include perceptual, oculomotor and cognitive control in everyday visual-cognitive tasks like scene perception, object-in-scene search, and reading. I approach these issues with experimental, corpus-analytical, and computational modelling techniques. Because human visual perception involves active information seeking via eye movements, I use eye tracking as my primary behavioural method. As the proposed projects involve eye tracking, students will learn how to collect such data with an eye tracker (technical equipment), and how to process and analyse the data.

1. On the (un)importance of foveal vision during visual search in real-world scenes

Visual search—looking for a specific item or object in a visual scene—plays an integral role in our daily life. Intuition may suggest that visual search crucially relies on our high-acuity foveal vision. Indeed, foveal vision was found to be necessary when searching for a target letter in alphanumeric displays (Bertera & Rayner, 2000). In contrast, foveal vision was not necessary to correctly locate and identify medium-sized target objects in natural scenes (Nuthmann, 2014). As a first attempt to reconcile these seemingly conflicting findings, this project will combine design features from both paradigms such that observers search for the letter “T” embedded in greyscale pictures of real-world scenes. The main factor to manipulate is the presence vs. absence of foveal vision; the absence of foveal vision will be simulated using the gaze-contingent Moving Mask technique. In addition, we will manipulate the size of the target letter.

References:


2. Effects of target size on the visual span during search in real-world scenes

Visual span denotes the region around the current point of gaze from which viewers can take in “useful” information when viewing a scene or searching for a target object in the scene. In this experiment, we will measure the size of the visual span during a scene search task using the gaze-contingent moving window paradigm. The idea is to degrade scene information outside of the window that moves with the observer’s eyes. The general logic is to reduce the size of the window to find the smallest window that still supports normal search behaviour. The specific aim of the project is to test whether visual span size depends on target size (Nuthmann, 2013, for speculations). To facilitate the target size manipulation, we will use
context-free letter targets as in Project 1. To assess visual-span size, the target size manipulation (small vs. large) will be crossed with 3 different window sizes (plus no-window control conditions).

References:

3. Eye-movement control during reading (2 projects)
When reading a line of text, our eyes do not move smoothly along the text, but make short and rapid movements (saccades) intermixed with stops (fixations) lasting about 200 ms. During fixations, the eyes remain relatively still and visual information is extracted from the text. The projects will contribute to what is called a (correlational) corpus study with a quasi-experimental design (cf., Kliegl et al., 2004). That is, subjects will be reading some 150 single sentences forming the Edinburgh Sentence Corpus (ESC) with no explicit experimental manipulation. For each word of the ESC, information about word length and word frequency is available. Some word predictability norms are also available, to which project students may contribute. The eye-movement data will reveal on which word, or even letter within a word, readers fixate. Students are expected to study relevant literature and decide on a question and/or type of analysis they want to test with the collected eye-movement data. To give an example, the project could investigate how fixation times vary as a function of word properties, using multiple regression analysis (cf., Kliegl et al., 2004).

References:

PROF MARTIN PICKERING
Email: martin.pickering@ed.ac.uk
Contact method: By email.

Having a conversation is something we do every day and yet we still know very little about how our cognitive system can manage it. Most research in psychology of language focuses on how we speak or how we process what others say, but understanding conversation requires bridging the two, and one way of doing this is to test two speakers instead of an individual speaker or an individual listener. Project 1 and 2 below take this approach. Project 3 looks at one core component of smooth conversations: the ability to anticipate when the current speaker will stop speaking.

1. Imagining what you are saying
What happens if I imagine you speaking while I am preparing to speak? In previous work, we showed that when we imagine that somebody is speaking at the same time as we are, our language production system undergoes increased interference (even if we cannot hear the other person speaking at all; Gambi, Van de Cavey, & Pickering, 2015). In other words, we
take longer to start speaking if we know that another person is speaking at the same time as us. We think this happens because we cannot help but representing the fact that somebody intends to speak, which could help explaining why people rarely speak at the same time in conversation. But can we do more? Can we also represent what somebody is about to say (e.g., are they going to talk about food, furniture, or some other semantic category)?. This project will build on our previous study and test whether speakers can, after all, form more detailed “images” of their partners’ speech when they are given information about what their partners will say in advance.

Reference:

2. Speaking as one
A remarkable phenomenon that happens in conversation is people completing one another’s utterances. This phenomenon is interesting because one speaker seems able to anticipate and coordinate with what the other is about to say in real time. In this project, we’ll ask pairs of participants to jointly describe a simple action depicted on a picture. One person will start the description and the other will finish it off, trying to leave no silent gap in between (i.e., as if the whole description had been made by a single speaker). By comparing this situation to individually produced descriptions, we’ll test whether coordination of utterances between speakers is similar to coordination of utterances within speakers.
Reference:

3. Anticipating when you’ll stop speaking.
Across languages, people take turns speaking with a median latency of 0 to 200 ms (Stivers et al. 2009). This suggests that they do not simply wait for another person to stop speaking, but they try to actively anticipate when they will stop. One hypothesis is that they can do this by guessing the content of the speaker’s utterance (for example, forming a rough estimate of how many more words they are going to utter; De Ruiter, Mitterer, & Enfield, 2006). This project investigates what type of information listeners can use to make these guesses.

References:

4. Social aspects of alignment
People tend to repeat each other’s choices of words and grammar in a way that appears to underlie communicative success (Pickering & Garrod, 2004). To what extent is this tendency affected by social factors? Do interlocutors tend to like partners more if they repeat aspects of their utterances? And are people more likely to align with people who they appear to have more in common with? This project will combine work in social psychology and the psychology of language using experiments that measure the causes and effects of linguistic repetition.

Reference:

DR HUGH RABAGLIATI
Email: hugh.rabagliati@ed.ac.uk
Contact method: By email

My lab works on how children learn language, with a particular focus on meaning: How children learn the meanings of words, and how they learn the procedures for mapping complex thoughts to structured sentences. More broadly, I am interested in conceptual development (which can interact with language development, and pose fun questions about linguistic relativity) and cognitive development. Typically we assess questions about these domains by recording children's explicit responses to questions while also monitoring eye movements as a more implicit measure of understanding.

While a lot of our research involves testing children, we also ask questions that are easier to answer by testing adults, for example, the role of conscious awareness in understanding language.

I am only likely to supervise a few projects this year. Some example projects are below, but I'm always happy to chat with motivated students who want to design their own project. Developmental work is typically arduous: Recruiting and testing children takes a lot of time. Project students will therefore be expected to muck in in the lab, helping everyone in recruitment, testing and data processing. This means starting research early, i.e., get in touch as soon as you can. If you haven't read any of my papers, you can find them on our lab website: http://www.psy.ed.ac.uk/homepages/the-rab-lab/)
1. Language processing in adults
What role(s) does conscious awareness play in how we understand language? In this project, students will use techniques like masked priming and continuous flash suppression to test whether information that is recovered from unconsciously presented words is combined together to create sentence level meanings.

Reference:

2. Language development
a) Language comprehension
How do children learn to understand sentences? One possibility is that they learn via prediction: They constantly make guesses about what they will hear next, and then revise their internal grammars whenever there is a mismatch. In this project, we would use eye tracking to examine whether young (3-5 year old) children really make predictions about upcoming words, and if so, what sort of predictions they make? For instance, do they predict the sounds of upcoming words? This work is potentially important for understanding why some children have difficulty acquiring language.

Reference:

b) Language production
A critical component of carrying on a conversation is ensuring that you speak in a clear and understandable way. For instance, if you were planning to meet a friend, you would not tell them to meet you outside the coffee shop, because Edinburgh is full of coffee shops. Rather, you would need to specify the exact shop. Children learning to talk need to master this task and, as anyone has ever had a conversation with a young child can attest, they do not always succeed. We are interested in studying why children have difficulty monitoring the comprehensibility of their speech.

Reference:

c) Linguistic and conceptual development (incl. relativity)
Language provides a code for teaching complex thoughts. How do children take advantage of this code? Studies in this area can examine a) what types of explanations children like to listen to, and b) whether learning about the structure of a language can help teach children something about the world.

Reference:
1. **Eye-tracking a class of students** (One individual project available only)
The student will use a very novel technique to assess where people are looking during a lecture. A Y1 Psychology lecture will be presented on film. At certain points in the film, a grid of letters and numbers (e.g. j1, j2, j3, …) will flash onto the whole screen for 120 msec. The members of the audience will be required to write down the item on the grid that they could see (thus capturing where they were looking at that instant). The student will gather in the record of all the items seen by each audience member during the film, along with details of where each person was sitting, plus other questionnaire data. The student, together with the supervisor, will work out the points in the lecture at which the grid should appear, so as to test hypotheses about how an audience responds to particular aspects of the lecture and the lecturer’s behaviour. The student will be required to supervise production of the film, decide on the points at which to record fixations, hand-input a lot of data from response sheets, represent the data graphically, and analyse the data using inferential statistics. The student will be required to read up on the issues surrounding audience attention.

**Indicative bibliography:**

2. **Characterising the work of a clinical psychology practice** (One individual project available only)
The student will work with a clinical psychologist in a private practice in Edinburgh to carry out a piece of research that characterizes the individual therapy being carried out in the practice. Four previous projects there have all looked at different aspects of clients’ involvement, using closed-case files (and a questionnaire study in one project) and asking questions such as how clients manage their own involvement with the practice, periodicity of appointments and length of treatment, and conduct of EMDR (Eye Movement Desensitization and Reprocessing therapy), and sex differences in therapy. The precise topics will be agreed in discussion between the therapist, the student and the internal supervisor (RCS). (All four previous projects are in the process of being written up for a journal.) The student will gain an insight into the workings of a practice, and may make a contribution in terms of published research. The student will probably be required to assess closed case files, input data, carry out some descriptive and inferential statistics, and read up on the literature surrounding a particular issue in therapy (to be determined).

**Indicative bibliography to be announced.**

3. **Scene searching and the cortical hemispheres** (One individual project available only)
The student will use a very new technique for exploring visual scene searching and the processing preferences of the cortical hemispheres. This novel technique (devised here in Edinburgh this last year) allows the participant to search two different scenes simultaneously with different respective hemispheres. The student will learn to use the Eyelink-1000 eye tracker. Stimulus materials will need to be generated from an existing set, possibly with some graphical adjustments. The student will discuss with the supervisor the nature of the hemisphere-specific processing that will be investigated; it might be the effects of colour, blurring, eye-level in street scenes, and so on. The student will run the experiment on a number of people (to be decided), and will be responsible for organizing the data and testing the hypothesis decided upon regarding hemispheric preferences in scene viewing.

**Indicative bibliography:**
4. Scene searching and the effects of hemispheric stimulation (One individual project available only)

The student will use a brand new technique for exploring the effects of asymmetric hemispheric stimulation on visual scene searching. This novel technique requires the participant to stimulate one or other of the cortical hemispheres using a hand-held buzzer. Stimulation of the hand affects the contralateral hemisphere. We will investigate how the asymmetric stimulation affects the search behaviour of scenes. The student will learn to use the Eyelink-1000 eye tracker. Stimulus materials will need to be generated from an existing set, possibly with some graphical adjustments. The student will run the experiment on a number of people (to be decided), and will be responsible for organizing the data and testing the hypothesis decided upon regarding asymmetric hemispheric stimulation in scene viewing.

Indicative bibliography:

DR PATRICK STURT
Email: Patrick.sturt@ed.ac.uk
Contact method: By email

1. Processing of mathematical expressions
In daily life, human cognition often requires the processing of information that has a hierarchical structure. This project will explore how people process hierarchically structured mathematical expressions, such as $2 + 3 \times 5$. The project may use reaction-time recording, a priming methodology, or eye-tracking.

References:
Scheepers, C., and Sturt, P. (2013). Bi-directional syntactic priming across cognitive domains: From arithmetic to language and back. (Manuscript; available from Patrick Sturt)

2. Interference in number agreement processes
In many languages, including English, the number of a sentence subject has to agree with its verb: we can say The labels were white but not The label were white. Recent work has shown that the way we process number agreement is affected intervening words, so, for example, The label on the bottles were white causes less processing difficulty than The label on the bottle were white, even though both of these sentences are ungrammatical. One interpretation of this phenomenon is that it reflects memory retrieval interference: in other words, at the verb were, the word bottles interferes with the retrieval of label. However, there are many unresolved questions relating to this: for example, does interference only affect ungrammatical sentences? Do similar interference effects occur for different types of linguistic relations? This project will use either a reading time methodology, or eye-tracking, to answer one of these questions.

Reference:

Projects 3 and 4
In addition to the above projects, I would be happy to supervise any project within a wide range of topics in language processing. These could include studies on how we resolve the referent of a pronoun, how the structure of a sentence affects how deeply it is processed, and many others, which you could discuss with me before submitting your choices. I would
also welcome students who wish to pursue their own ideas for projects, as long as they are on a topic that I am qualified to supervise. It would also be possible to conduct a replication study of an existing piece of research.

**DR ALEXANDER WEISS**

Email: alex.weiss@ed.ac.uk

Contact method: By email to set up an appointment

Students choosing me as their dissertation supervisor will be required to devise their own dissertation project. I am willing to supervise feasible dissertations that focus on topics such as human or nonhuman animal personality, animal behaviour, evolutionary psychology, health psychology, and aging. Please see me before you decide to select me as it is important that we discuss the potential feasibility of a project or any pitfalls.