# School of Social Science & Psychology
## Summer Scholarships 2014/15

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**Project title 1:** The Psychophysiology of Gambling in Older Adulthood

**Supervisory team:** Dr Phoebe Bailey and Dr Craig Gonsalvez

**Contact information for supervisor**
Dr Phoebe Bailey (02) 9772 6230  p.bailey@uws.edu.au

**Project description**
A large Australian survey found that 29 per cent of 65-74 year olds had played gaming machines in the previous 12 months (S.A. Department for Families and Communities, 2005). Worryingly, older adults (aged 65+) have become a rapidly growing market for the gaming industry, including in Australia (for a review see Tse et al., 2012).

Gaming machines sometimes present gamblers with fake-wins which are 'wins' that amount to less than the original wager (i.e., losses disguised as wins). Thus, fakes wins have been shown to increase arousal or excitement relative to a loss, as indexed by heart rate and skin conductance (Wilkes et al., 2010).

According to socio-emotional selectivity theory (Carstensen et al., 1999), older adults place increasing emphasis on emotionally fulfilling goals, which results in a bias towards positive information and/or a neglect of negative information (see Peters et al., 2011). Relative to young, older adults might therefore attend less to losses and/or more to fake wins.

Socio-emotional selectivity theory also posits that age-related positivity is the result of conscious motivational processes. In line with this idea, some studies show that older adults with better cognitive functioning are more likely to experience the positivity effect (see Peters et al, 2011). Identifying between, and within, age group differences in responding to win and loss events might therefore identify why some older adults may be at increased risk in a gambling situation. Specifically, older adults with high relative to low cognitive functioning may respond more positively to fake wins as indexed by skin conductance and heart rate.

**Project Aims**
The primary aim of this research is to identify whether some older adults respond more positively to fake wins, and are thus more susceptible to this means of prolonging gambling.

**Project Methods**
With assistance from the supervisors, the student will recruit and test up to 20 young and 20 older adults. This number of participants will be sufficient to form a pilot study. Also note that Dr Bailey holds a registry with contact details for over 100 older volunteers who recently completed intelligence and cognitive screening tests. The student may use these scores to pre-select older adults who are high versus low in cognitive functioning.
The student will be trained to use a Biopac data acquisition system to measure changes in skin conductance and heart rate while participants play a computer-simulated gambling task. The gambling task will involve four conditions in which the frequency of occurrence of fake wins will be differentially manipulated. Participants will be allocated free credits so will lose no money of their own, but may win a food/entertainment voucher if they win on the gambling task.

The student will also be trained to assess cognitive functioning using the Mini-Mental State Examination (to screen for signs of dementia), the National Adult Reading Test (to determine full-scale IQ), and tests of memory and executive functioning.

The student will collect demographic information, and will ask participants to complete questionnaires that assess positivity.

Note that the supervisors will organise Ethics approval and ensure that all of the tasks are set up for when the student arrives to ensure that they can complete the project within the 8 weeks.

Data Analysis:

The supervisors will show the student how to enter and analyse the data in SPSS.

Opportunity for Skill Development

This project will equip the student with specialist psychological research skills. First, the student will receive training from Dr Bailey and Prof Gonsalvez in the measurement of two psychophysiological indices; heart rate and skin conductance. Second, the student will gain experience working with older adults. This type of experience in research, with populations other than first year students or young adults, is quite valuable. Third, the student will be involved with methods of statistical analysis that may be new to them. They will have the opportunity to be involved in all aspects of a research project, from the testing sessions to the final data analysis and write-up of results. Two conference presentations are planned (one on skin conductance and the other on HR at the APS or Australasian Psychophysiology Conference 2015). The student's name will be included as a minor author on the conference outputs, and also on an ensuing publication, should this occur. If the data are published, the student will also learn about various aspects of authorship, including how to select appropriate journals to submit to and how to respond to reviewer comments after peer-review. At all stages, the student will receive mentoring from two research active staff members, Dr Bailey and Prof Gonsalvez, facilitating interest and enrolment in future PG/HDR research.

Students are required to have the following skills to apply

The student should be enrolled in Bachelor of Psychology, Bachelor of Arts (Psychology), or Bachelor of Sciences (Psychology)
Project Title 2: Improving Assessment of Psychology Practicum Competencies in Field Placements

Supervisory team: Prof Craig Gonsalvez & Mr Robert Brockman

Contact information for Supervisor: Professor Craig Gonsalvez (02) 47360185 c.gonsalvez@uws.edu.au

Project Description

Recent developments in competency-based pedagogies have drastically changed professional training in psychology and other professions. Competency-based approaches have attained wide acceptance within academic and professional circles but progress is hampered by major inadequacies in relation to competency assessment. Specifically, a range of biases including halo and leniency biases affect ratings of practicum competencies, with these problems being evident in psychology and other allied health disciplines. The problem has been identified as a priority issue in strategic plans of Government and key funding bodies including the Office of Learning and Teaching. Over the past 5 years, Prof Gonsalvez has been the leader of two OLT projects, both multi-site projects designed to examine the nature of problem and to enhance the reliability and validity of assessment of practicum competencies. This context provides an excellent opportunity for a high-achieving student to observe and indeed become embedded in a range of research activities that relate to applied research.

In addition to satisfying outcomes for the student concerned, the project will also add to the and in future OLT and similar initiatives.

Project Aims

The broad aim is to improve the reliability and validity of supervisors' ratings of competencies attained by clinical psychology trainees. Specifically, the objectives will include;

1. determine if supervisor ratings of trainee competencies during earlier placements will predict ratings on subsequent placements and
2. examine the dimensional structure of competency ratings.
3. to provide the student with a research experience that will foster positive attitudes toward research and the scientific method (e.g., interest, engagement, the scientist-practitioner mindset and to equip the student with a research knowledge and skills.

Project Methods
Participants and data: In order to achieve Objectives 1 and 2, the project will use data already
acquired in 2013 from a previous multi-site project. A total of 400 end-placement ratings attained by students on the Clinical Psychology Practicum Competencies Rating Scale (CYPRS) across 4 placements will form the primary data set for the project. The CYPRS comprises 50 items distributed across 10 different domains.

Method: Ratings acquired by a group of trainees (N=60) across all 4 placements will be analysed (e.g., through multiple regression analyses) to determine whether and which variables (including scores on earlier placements) could predict competency scores on subsequent placements. The analyses will also determine whether predictions are influenced by competency domain and/or other variables. The competency scores will also be subjected to factor and cluster analyses (hierarchical discrimination) to determine which competencies congregate together as higher order clusters.

The student's involvement in the use of archival data will provide useful knowledge and skills but within a somewhat narrow context. To ensure a holistic research experience, and to achieve Objective 3, the student will ALSO be involved in the recently funded project (ID14-3639), a prospective initiative that aims to design a new instrument comprising a catalogue of vignettes to assess competencies (see below for details).

Finally, the inclusion of a junior researcher (Robert Brockman) as a second supervisor in a multi-site project such as this will serve a valuable mentoring function and contribute to his development as an academic and researcher.

**Opportunities for Skill Development**

Improved knowledge and skills: Knowledge about ethical issues in conducting research, contributing drafts sections of an ethics proposal, conducting literature reviews on the topic, tools and strategies to manage data, tools to organize and integrating research findings including use of Endnote, data analyses including use of SPSS.

Enhanced attitudes and relationship competencies: improved awareness of the scientist practitioner mindset and of importance of relationship competencies in team-based research These outcomes will be achieved by having the student work closely with the Project Officer, and the two supervisors, and sit in on research and evaluation meetings of the larger team, and maintain an experiential log indicating analyses and evaluation of research process and outcomes.

The results of the project will be presented as two conference presentations/posters at the 2015 APS Conference, with the student's name as a minor author. The first will deal with Objective 1 and the second poster will deal with Objective 2.

In addition, depending on the student's level of contribution, it is possible that the student's name is included as a minor author on a publication.

**Students are required to have the following skills to apply**
The student should be enrolled in Bachelor of Psychology, Bachelor of Arts
(Psychology) or Bachelor of Sciences (Psychology). Interest in clinical or applied research.
Project Title 3: Identifying Best Practices in Police Recruit Training

Supervisory team: Professor Karl Roberts & Dr Nicole Asquith

Contact information for Supervisor:
Professor Karl Roberts   (02) 9772 6494   karl.roberts@uws.edu.au

Project Description

As part of the growing trend towards a professionalization agenda in Australasia, police organisations are increasingly partnering with higher education institutions to create degree pathway programs for recruit training. This summer research internship will contribute to the Policing program's review of recruit curricula in order to identify the core and critical learning outcomes required for contemporary policing, and document best practice model for structuring practitioner and academic learning. This will be a standalone project (attributable to the student) that adds to existing research and academic program development undertaken within the School, and will contribute to the development of the UWS tender for NSW Police Force recruit training. The student will be required to liaise with policing organisations within the region, source public and institutional documents relating to police curricula (including assessment strategies and hurdle requirements) and document the training landscape for policing organisations in the region. Where possible, the student will also integrate international best practices into the final report for stakeholders. It is expected that in addition to enhancing the UWS tender, this project will lead to a jointly-authored article for either the Journal of Criminal Justice Education, or Australasian Policing (depending on the findings generated from this summer internship project).

Project Aims

1. To identify and document current Australasian (and where available, international) police training curricula
2. To undertake a preliminary review of the research literature on the professionalization agenda in policing, and the role that higher education institutions play in police training
3. To identify the core and critical components of police recruit curricula

Project Methods

The student will be engaged in desktop research that will require them to map out current police recruit curricula, and undertake a gap and strengths analysis of the sourced data. The student will work with the supervisors to:

1. Liaise with Australasian policing services and their training centres/academies/colleges
2. Develop a research design and sampling frame for the required data (e.g., learning guides, lecture outline, assessment questions, and case
3. Undertake a comprehensive review of public documents on police training and policies and practices

**Opportunities for Skill Development**

1. In addition to building the student's academic skills in identifying, documenting and analysing grey policy and practice literature, the student will be provided with two opportunities to build skills and research networks.

2. Liaison with Australasian policing researchers and practitioner

3. Building rapport with, and sourcing documents from, policing practitioners

4. Publication and Dissemination of Research Outputs

5. Development of a formal SWOT analysis for distribution to research informants.

6. Development of co-authored paper with supervisors (for the Journal of Criminal Justice Education and/or Australasian Policing)

7. Contribute to the proposal developed for UWS' bid for NSWPFS training

**Students are required to have the following skills to apply**

Ideally applicants should be in their final year of their undergraduate degree with a plan to apply for Honours in 2015 in Policing and Criminal Justice, or with a policing focus in Criminology.

It will require a student with high level communication skills in order to liaise with police training centres and academies and an ability to extract critical information on police recruit curricula. With guidance from the supervisors, this source material will be synthesised as a SWOT Analysis of police training and education.

Supervisory team: Dr Laura Schatz & Dr Rae Dufty-Jones

Contact information for Supervisor: Dr Laura Schatz (02) 47360083 l.schatz@uws.edu.au

Project Description

This project will analyse economic change impacting Sydney's peri-urban regions. Despite metropolitan economies often being presented as singular identities, research has shown that peri-urban regions in Australia's major metropolitan centres have experienced distinct and significant demographic and economic change (see, for instance, Sinclair & Bunker, 2012 and Houston, 2005). However, little is known about the specific characteristics of this change, particularly change occurring since the turn of the twenty-first century. We have, as yet, little sense of exactly how trajectories of economic change differ first between peri-urban regions and their greater metropolitan regions and second within regions in the peri-urban sphere. This analysis is essential if we are to understand the regional economic trajectories of peri-urban Sydney and to provide business, policy-makers and planners in peri-urban areas with an awareness, based on economic analysis, of the industrial and labour force competitive advantages and socio-economic weaknesses of their regions.

This project will form part of a larger project examining the economic change in greater metropolitan Sydney and builds on a paper presented by Dufty-Jones and Schatz at the 2014 Peri-Urban Conference (hosted by UWS). The student project will focus on the following research questions: How has the employment and industry structure of Sydney's peri-urban regions changed? What does this mean for peri-urban Sydney's economic future?

This project will involve undertaking shift-share analysis at the SA3 level within the peri-urban regions of Greater Metropolitan Sydney. The substantial nature of the data set means that there is potential for an honours project to stem from this Summer Research Scholarship as well as a larger nationally competitive project.

The project is located in the Urban Research Centre in the School of Social Sciences and Psychology. The project fits within one of the key research aims of the Centre - "Economies and Regional Infrastructure"- and advances the Centre's "keen and vested interest in understanding urban and regional dynamics in Greater Western Sydney, and remit to provide service to the region and its people." It also draws on the expertise of the two supervisors in research in regional development and economic change.

Project Aims

To analyze how the employment and industry structure of Sydney's peri-urban regions changed between 2001-2011; and
To consider what this change means for the economic sustainability of peri-urban
Project Methods

The method used in this project is a shift-share analysis. A shift-share analysis provides a useful tool for examining economic change and its regionally specific differences. Most importantly for the purposes of this research, it can reveal how change at the macroeconomic scale is differentially experienced by individual regions. It can also identify which industries in a region over time have a competitive advantage and which ones are experiencing structural decline (Blakely and Green Leigh, 2010).

In this project, the student will be contributing to the conduct of a series of shift-share analyses at the SA3 geographic scale for Sydney's peri-urban regions. There will be three stages to the project over the 8 week period:

Stage 1 (3 weeks)
Alongside with and supervised by Dr's Schatz and Dufty-Jones, the student will source, collect and organize (in Excel) the relevant labour force, occupational status and industry employment data from the quinquennial Census of Population and Housing conducted by the Australian Bureau of Statistics from 2001-2011.

Stage 2 (3 weeks)
The following 3 weeks will be used by the student to conduct the shift-share analysis of the SA3 areas in the three inland peri-urban regions. This stage of the project will be closely supervised and assisted by Dr's Schatz and Dufty-Jones.

Stage 3 (2 weeks)
The final 2 weeks will be used by the student to complete a report on their analysis and findings from this research and to make a series of conclusions and recommendations based on the analysis and findings during the last two weeks. Dr's Schatz and Dufty-Jones will supervise this stage and provide feedback on drafts of the report.

Opportunities for Skill Development

The student will develop skills in quantitative data preparation and analysis and, more particularly, an understanding of how to use ASS data in conducting shift-share analyses.

The student will also have the opportunity to be a co-author on a journal article for the journal Geographical Research that is anticipated to result from this project.

Students are required to have the following skills to apply

This project would suit a student with interest in economic issues.

The project would be best suited for a student who is at the end of their second or in their third year of studies.
It would be helpful if the student has taken unit 101591 'Economics of Cities and Regions', but it is not essential.
Project Title 6: The Role of Evaluative Conditioning in Infant Word Learning

Supervisory team: Dr Gabrielle Weidemann, Dr Paola Escudero & Dr Rachel Robbins

Contact information for Supervisor:
Dr Gabrielle Weidemann   (02) 9772 6669  g.weidemann@uws.edu.au

Project Description

Previous research has shown that infants show a preference for individuals who they have previously seen speaking with infant directed speech (IDS) which is not present for those previously seen speaking with adult directed speech (ADS; Schachner & Hannon, 2011). Furthermore, the presence of positive affect in IDS not only makes infants like the speaker more, but it also attracts their attention to so each sounds (Benders, 2013) and may be one of the reasons why IDS enhances infant's ability to discriminate speech sounds (Liu, Kuhl, & Tsao, 2003). We do not yet know whether affect serves to facilitate the learning of word-object associations.

The proposed student project is a part of a larger body of research investigating the role of associative learning in the development of social cognition. This larger project is a collaboration between researchers in the School of Social Sciences and Psychology, UWS (Dr. Gabrielle Weidemann & Dr. Rachel Robbins), at the MARCS Institute (Dr. Paola Escudero), the School of Psychology at the University of New South Wales (Dr. Jenny Richmond) and the Department of Psychology, University of California (Prof. Scott Johnson). Initial pilot work for this project has shown that simply pairing an emotional face with a coloured geometric shape can influence infants' preference for the shape on a behavioural choice test and that the development of this preference is influenced by the pattern of infant looking during the exposure phase. This change in preference for a stimulus following the pairing of an initially neutral conditioned stimulus (CS) with a positive or negative unconditioned stimulus (US) is known as associative learning of evaluations, or evaluative conditioning (Hofmann, De Houwer, Perugini, Baeyens, & Crombez, 2010), and has been studied extensively in adults.

Evaluative conditioning in early development remains unexplored and its potential implications for social cognitive development in infancy have never been assessed. This larger project aims to test the hypothesis that associative learning, in the form of evaluative conditioning, underlies social and language learning early in life.

The experiment will be conducted at the MARCS Institute Babylab and would employ a familiarization phase in which infants are exposed to an object naming video paradigm with two different objects named. One of the objects will be named by an actress in the video with obvious positive emotional affect in the voice and face of the actress and the other will be named with neutral affect. Infants will then be given a visual preference test for looking at the two different objects. This will be followed by a behavioural choice test in which the infants will be presented with both objects and their choice of object to interact with will be recorded (Harnlin, Wynn, & Bloom, 2007). This will be followed by an assessment of word learning accuracy in which infants will be presented with six assessment trials. The two
objects will appear side-by-side (2 trials) and each object will be presented with a picture of a cat (4 trials), with the left-right position of the stimuli counterbalanced. The child will hear the same actress saying one of the trained words or the word "cat" within two sentences (i.e. "Where's the X?" and "Look at the X?"), produced with a neutral, inquisitive intonation. The trials with the word "cat" will precede those with the trained words to make sure the child is able to perform the task with a familiar word and to induce a word-object association setting (Fennel & Waxman, 2010). Preferential looking at the correct object will be taken as an index of word learning accuracy. It is hypothesised that infants will show a preference for the object paired with positive affect and that this will also result in more accurate word learning.

**Project Aims**

1. To investigate 18- to 20-month old infants' object preference as a result of object-affect pairings.
2. Word learning accuracy as a function of object-affect associations

**Project Methods**

Thirty 18- to 20-month old children will be presented with two thirty second videos of an actress naming two different objects, in one of the videos there will be obvious positive affect in voice and face but the other will be affect neutral. An attention-getter will be presented prior to each video in order to draw the children's gaze to the presentation screen. Children will sit on their caregiver's lap in front of a table with a computer screen and a Tobii eye-tracker, which will record the children's eye movements. From the control room the student will control the experiment, initiating each trial once the child's gaze was fixated on the attention-getter.

**Opportunities for Skill Development**

This project will allow the student to: gain an understanding of theories of child development and also associative learning; to assist in preparing experimental materials; to conduct an infant experiment; to organize and analyze behavioural and eye gaze data, and to write up the research for publication. The student will also develop knowledge in the field of developmental psychology, and principles of infant testing and eye tracking.

The student will be trained in the MARCS Babylab participant booking system. They will become familiar with the software used to develop the experiment (e.g. E-Prime) and with the testing hardware (i.e. Tobii eye-tracker). The student will be extensively trained in the protocol of experimentation with infant participants and will develop valuable and sought-after skills in the set-up and running of an infant and child eye-tracking experiment. They will develop skills in the processing of data extraction and data organization using Microsoft Excel and will gain experience using SPSS for data analysis. In addition, expertise in presenting the research in written and oral form will be developed.

Importantly, the student will have exposure to the School of Social Sciences and Psychology research environment as well as MARCS BabyLab, providing insight
into the broad scope of psychological research. They will have the experience of working within a team and will develop important interpersonal and team-based skills.

**Students are required to have the following skills to apply**

It is a requirement that students will be enrolled in Bachelor of Arts (Psychology), Bachelor of Social Science (Psychology), or Bachelor of Psychology. The student will need to complete a NSW Working with Children check. They will also need to provide a vaccination record card with evidence of their current vaccination status. If these vaccinations do not meet the requirement set by the MARCS BabyLab, the student will need to acquire the necessary vaccinations.
Project Title 7: Police Curriculum and Policing Vulnerability

Supervisory team: Dr Nicole Asquith & Dr Isabelle Bartkowiak-Theron

Contact information for Supervisor:
Dr Nicole Asquith (02) 97726102

Project Description
Educating police about vulnerable populations is complex, and if done badly, can aggravate estranged relationships between policing organisations and the communities they service. Police training has traditionally dealt with vulnerability as a problem to be solved with special-timely and confusing systems and processes. In police training, recruits are required to learn about 'special' communities who may be susceptible to increased vulnerability in the criminal justice system. These training opportunities are limited, with an increasing array of vulnerable groups demanding inclusion (and allocated 'set' time) in police training curricula. Policing services are beginning to recognise that this 'silo' approach to diversity training is unsustainable. The proposed Research Internship will investigate the various ways in which Australasian policing services train their recruits about vulnerability.

The proposed Summer Research Internship builds on and contributes to the supervisors' established research and education agendas in this field. In particular, this project will consist of a standalone study (attributable to the student), which will contribute to an essential component the supervisors' ARC Discovery Grant submission in March 2015, and will be written up in a co-authored journal article. The wider project, Policing Difference, Policing Vulnerability aims to investigate how vulnerability is addressed in the policing process, with a particular focus on frontline policing and strategic policy in an age of globalisation, human rights, and increased diversification of society. We suggest that when vulnerability is recognised as multiple and layered, and its ubiquity in the criminal justice system is acknowledged, policing organisations are better placed to respond in ways that do not further exacerbate entrenched cultural barriers. Instead, vulnerability should shape what police 'do' everyday; and not just in those encounters where officers believe the victim or offender are a member of an identified 'at risk' social group. This approach to vulnerable people policing transforms vulnerability from a specific attribute of some groups into a set of individual, social and institutional relationships that are best managed through a human rights discourse.

Project Aims
1. To identify and document current Australasian police training approaches to vulnerable (or 'at risk') victims and offenders
2. To synthesise this data as a formal SWOT analysis
3. To identify good and bad practices in relation to police training on vulnerability and contribute to the debate about police training, diversity and vulnerability in the criminal justice system

Project Methods
The student will be engaged in desktop research that will require them to map out current practices in relation to police training on vulnerability and undertake a gap...
and strengths analysis of the sourced data. The student will work with the supervisors to:

1. Liaise with Australasian policing services and their training centres/academies/colleges
2. Develop a research design and sampling frame for the required data (eg learning guides, lecture outline, assessment questions, and case scenarios)
3. Undertake a comprehensive review of public documents on police training and policies and practices relating to vulnerability in policing

Opportunities for Skill Development

1. In addition to building the student's academic skills in identifying, documenting and analysing grey policy and practice literature, the student will be provided with two opportunities to build skills and research networks.
2. Liaison with Australasian policing researcher and practitioner
3. Building rapport with, and sourcing documents from, policing practitioners
4. Networking with practitioners and scholars at the inaugural Policing Vulnerability symposium at the University of Tasmania November 2014 (if intern has been selected and is available)
5. Publication and Dissemination of Research Outputs
6. Development of a formal SWOT analysis for distribution to research informants
7. Development of co-authored papers with supervisors (one peer-reviewed TILES Briefing paper, and one article for the Journal of Criminal Justice Education)

Students are required to have the following skills to apply

Ideally applicants should be in their final year of their undergraduate degree with a plan to apply for Honours in 2015 in Policing and Criminal Justice, or with a policing focus in Criminology.

It will require a student with high level communication skills in order to liaise with police training centres and academies and an ability to extract critical information on the requirements of policing organisations to teach recruits about vulnerable populations. With guidance from the supervisors, this source material will be synthesised as a SWOT Analysis of police training and education.
Project Title 8: Investigating Timing and Rhythmicity in Upper and Lower Limbs Using a Newly Developed Tapping Device

Supervisory team: Dr Ahmed Moustafa & A/Prof Peter Keller

Contact information for Supervisor:
Dr Ahmed Moustafa (02) 9772 6847  a.moustafa@uws.edu.au

Project Description
This project within a larger project investigating the neural substrates of upper and lower limb control utilising brain imaging.

A novel measurement device has been approved funding and is currently in the development stage with a technical team at UWS. It will be completed before the commencement of the '14/'15 Summer internship program. The newly developed tapping device will measure timing, synchronicity, trajectory, and force of foot and hand taps. By using the tapping device, we will measure how people learn to synchronise food and hand taps with presented audio stimuli. Participants will include healthy controls and patients with basal ganglia dysfunction. Testing of healthy controls will take place at UWS, while testing of patients will be primarily conducted at the Brain and Mind Research Institute (BMRI).

Participants will be recruited via fliers on campus and around Bankstown. The project will reveal for the first time whether the brain controls hand and foot movements in a similar or different fashion. This question has theoretical implications and potential practical applications.

Project Aims

1. To investigate whether there are significant differences in timing and rhythmicity between upper and lower limbs in healthy controls
2. To investigate whether basal ganglia damage interferes with timing and rhythmicity of upper and lower limb movement
3. To investigate which movement parameters (trajectory, timing or either) change as healthy controls and patients learn to synchronise responses.

Project Methods
This project will utilize a novel finger- and foot-tapping paradigm developed by A/Prof Keller and Dr.Moustafa.

Participants will be seated in front of a table wearing headphones, and will be required to tap (with either a finger or foot) along to a sequence of auditory tones presented by a computer. Tapping will be executed with each hand and foot separately (dominant and non-dominant) across a series of counterbalanced blocks. Each trial within a block will consist of a sequence of 60 tones. There will be 10 trials per block. The timing of the sequence tones will be governed by a computer algorithm that allows the computer to adapt to the participant's tap timing. Different degrees of adaptivity will be adopted in separate experimental conditions,
allowing different degrees of dynamic cooperativity to be simulated. This method
(which has been used in several published studies by Keller) permits the
participant's level of sensorimotor synchronisation skill to be thoroughly tested and
enables the quantitative assessment of the effectiveness of underlying timing
mechanisms.

The student will be responsible for recruiting participants, running the testing
procedure, and analyzing the data under the supervision of A/Prof. Keller and Dr.
Moustafa.

Opportunities for Skill Development

The student will develop the important skill of how to appropriately interact with
participants, provide clear instructions for how the experimental procedure will run,
and allow opportunity for questions afterward. The student will learn how to analyse
the data, as well as running appropriate statistical analyses. Additionally, the
student will learn how to interpret the results and formulate a written scholarly
report.

Students are required to have the following skills to apply

The student should be enrolled in a B. Psychology degree at UWS, and be in
their third year of study.
Project Title 9: Eye Movement Sequence Analysis

Supervisory team: Dr Tamara Watson

Contact information for Supervisor:
Dr Tamara Watson (02) 9772 6006  t.watson@uws.edu.au

Project Description
When looking at a visual scene we are constantly making eye movements. We need to make eye movements to build up a complete understanding of the visual environment. There are many factors that determine when a person will make an eye movement and where they will look. Psychologists are interested in what we can learn from quantifying differences between the eye movements people make around a scene. For example, it has been established that participants with autism will spend less time looking at the eye region of a face [1].

Commonly used analysis measures pre-specify areas of interest and simply establish things like how long a person spent looking within that region or whether their first eye movement was directed towards that region. This kind of analysis presupposes where the participant will look and often disregards fine detail about when participants looked within the region of interest. It cannot capture subtle differences between eye movement patterns through time.

A recent innovation has applied a genetic sequencing algorithm to the analysis of pairs of eye movement sequences [2]. This method enables us to quantify more subtle differences in looking strategy by establishing how similar two sets of eye movement sequences are. This allows us to establish subtle differences in looking pattern in the absence of a global difference according to traditional analysis methods. This strategy has so far only been applied to pairs of eye movement sequences and therefore doesn't allow us to draw conclusions about differences between groups of people.

This project will explore whether this sequence analysis strategy can be expanded to more flexibly accommodate standard eye tracking study designs. It will also explore whether there are other analysis methods that could also be applied in a novel way to eye movement data to extract a more detailed understanding of patterns of eye movements.


Project Aims
The development of a flexible method for establishing the quantitative similarity between sequences of eye movements. This is an exploratory project: what is implemented will depend on the options uncovered by the student.
Project Methods

1. Using existing sequence analysis methods as a starting point, the student will research possible enhancements to extend the utility of the current Scan Match toolbox. This toolbox is implemented in Matlab and is available as open source code.

2. The student will also research possible alternative methodologies, (looking across disciplines) for analyzing sequence data.

3. Using existing example eye tracking data the student will implement enhancements or begin implementation of new analysis methodology in Matlab.

Opportunities for Skill Development
The internship student will have the opportunity to identify novel data analysis solutions and apply modelling skills to real data. They will have the opportunity to improve/practice programming in the Matlab environment.

Students are required to have the following skills to apply
Students should have basic familiarity with Matlab and computational modelling. It is anticipated that students who completed the first year of a Bachelor of Engineering would meet the requirements of this project.