PSYCHE

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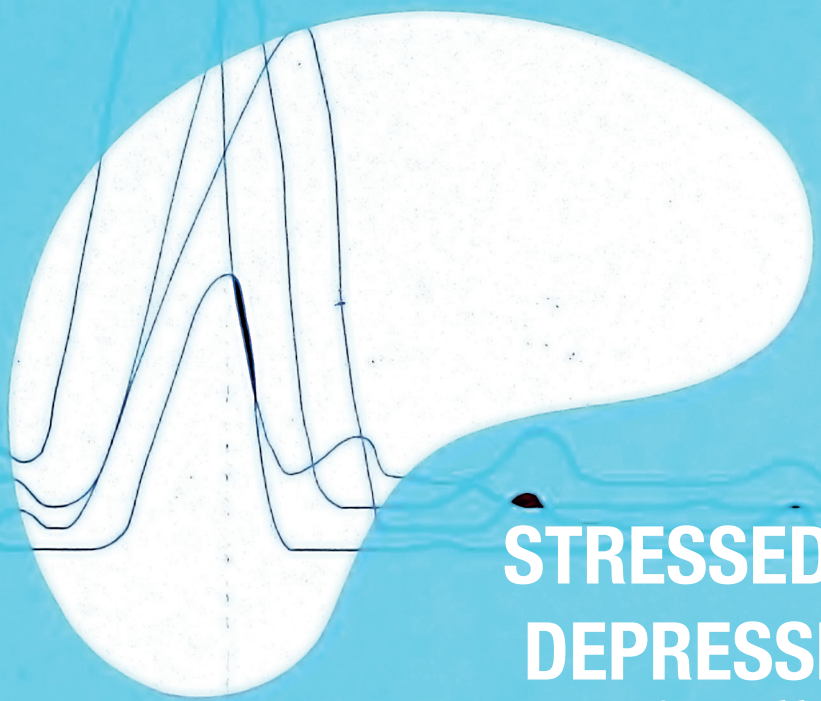

STRESSED & DEPRESSED

A review of mental health in Chinese high schools

fMRI: FRIEND OR FOE?

Weighing up evidence for using neuroimages in court

ALSO:

A chat with Professor Robin Dunbar

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"editor's correspondence

I AM delighted to present the very first issue of *Psyche* (two syllables!), the University of Bristol's new psychology magazine.

Psyche aims to encourage science writing by students and elucidation of academic research for the layperson.

This issue is fascinating, pithy. and should engage psychology enthusiasts of all kinds. The range of exciting articles fall broadly into two topics: cognitive biases and mental health.

Readers will also find a summary of a recent departmental seminar by Professor Robin Dunbar, followed by a short interview.

A point of interest: Prof. Dunbar informed us that there was a publication called *Stimulus* while he was a PhD student at Bristol!

Acknowledgements
I would like to thank the contributors, who range from undergraduates to university lecturers. As well, I am deeply grateful to the editorial team for their help with this publication.

The cover image is taken from a poster on electroconvulsive therapy.

Finally, a heartful thank you goes to the faculty and staff at the School of Experimental Psychology. Psyche is kindly supported by departmental funds.

Future Directions
Articles for the next issue will be accepted on a rolling basis; the next deadline will be announced soon.

Lastly, we accept letters to the editor. If you have anything to say about the following articles, let us know.

Enjoy! — *JL*

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The threat *of* NEUROSCIENCE *in the* COURTROOM

HOW much responsibility can we give ourselves for our actions? When a defence can show a criminal wasn't under complete control of their actions at the time, such as due to a mental illness, their punishment is often less severe. The question of free will is long-standing within moral philosophy and neuroscience. In recent years it has even crept into the word of law.

2009 was the first year functional magnetic resonance imaging (fMRI) was used as evidence in court. This occurred when Brian Dugan pleaded for a verdict of not guilty by reason of insanity (NGRI) for murder. His defence supplied a scan of his brain, to argue that Dugan was not in complete control of his actions as the result of his mental illness: psychopathy. Since then, there have been concerns and criticisms over the use of such 'neuro-evidence' in court.

The first concern arises from the fact that neuroimages, including those produced by fMRI, may have undue influence over the jury's decision.

For example, presenting a brain scan which supposedly shows that a person has psychopathic personality disorder may have more influence on the jury than a psychological report which tells them the same thing. This likely stems from the belief that neuroscience is a 'harder' science, and therefore should be treated as having more credible than it deserves.

There is also a large gap in laypeople's understanding of what fMRI actually shows. Contrary to popular opinion, it shows changes in blood oxygen levels, rather than direct 'neural activity'.

These concerns are grounded in scientific research. For instance, people gave more credence to scientific summaries which were accompanied by neuroimages than ones which were accompanied by graphs (McCabe & Castel, 2008). Likewise, mock jurors who were presented with anatomical brain images were more likely to reach a verdict of NGRI (Gurley & Markus, 2008), and execution rates of psychopaths were lower when the jury was given neuroimaging evidence (Greene & Cahill, 2011). This is probably due to

a false understanding of how imaging works, with the participants putting neuroimaging on a pedestal above other forms of evidence.

Another controversy rests in the use of fMRI as lie detectors. In another mock trial, lie detection using fMRI was much more persuasive to the jury than the use of other, much better established, technologies such as polygraphs (McCabe et al., 2011). This may be down to the participants' misbeliefs that neuroscience is able to 'see directly inside the brain' and measure the neural activity going on. Some people are even pushing for fMRI lie detection to be used as evidence in courts.

There are now two companies (No Lie MRI Inc and Cephos Corporation) offering the service of lie detection using fMRI. The problem, however, is that even within the scientific community, the reliability of fMRI to determine truthfulness is still hotly debated.

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Despite the ongoing debate, it is clear that the neuro-evidence is becoming ever more pervasive within courtrooms. As a result, the future will require a better understanding of neuroscience on the part of jurors and judges. Is neuroscience safe to use in the courtroom? The jury is still out.

Robert Udale
PhD Student

Want to know more?

http://news.sciencemag.org/scienceinsider/2009/11/fmri-evidence-u.html

www.cephoscorp.com

www.noliemri.com

Brain image taken with permission from Amy Davis Roth.

Metaphor in the mind

THE word "metaphor" probably takes you back to your secondary school English classes. If you studied from the same short story anthology that I did, it was a pretty safe bet that any puzzling aspect of any text, from a rippling pond to the flight of a pigeon, was a metaphor for "growing up".

Metaphor is not just a literary device. In some form or another, it appears in practically any utterance you produce, however mundane and devoid of flowery language. The way human language is structured is deeply rooted in metaphor, which perhaps underlies some aspects of our capacity for abstract thought itself.

In the 1980s, George Lakoff and Mark Johnson pointed out that many concepts central to our lives are linguistically constructed around sets of metaphors following a particular theme. For example, in English, love is a journey (consider the expression "this relationship isn't going anywhere", or "we'll have to go our separate ways"), while time is money ("I wasted half the morning", "she *spent* twenty minutes waiting").

Concepts can also be expressed using more than one metaphorical theme; for instance, love is a war and a patient as well as a journey:

"He fought to win her over."

"They have a strong, healthy relationship."

The metaphorical underpinnings of conceptualisation are not limited to grand concepts of great human importance, like love and money. Rather, they can apply to even the most prosaic-seeming ways of expressing oneself.

In English, when something is considered to be more than (or sometimes, better than) something else, it's expressed as being "higher". For instance, "the temperature went *up* last week". At first glance it's hard to notice that this is a metaphor at all; of course increasing something makes it go up. But that's only true for concrete, physical units.

There's no real sense in which your mark on the social psychology exam took up more physical space than your mark on the statistics exam, yet it was obviously "higher"; that's just how the language (and the concept) works. This doesn't just apply to English. The choice of metaphor will be different in other languages, but the

all-pervading sets of metaphorical domains are present wherever you look. They seem to be part of the way humans express themselves, not just a quirk of certain tongues.

Why is this the case? And why is this phenomenon so obvious, yet so well hidden from our intuitions about what constitutes a metaphor? You'll probably spot these metaphors all over now that you've been made aware of them, and it's fun to winkle them out.

An even more interesting exercise is picking up on the underlying patterns. The most important of these is the unidirectionality of these fundamental level metaphors from the abstract to the concrete.

That is, you won't find that these conceptualisations can help you talk about something physical or tangible in terms of a philosophical idea or a mental entity. It is always the other way. A good example in English is the expression "point out", where we can identify three levels of usage. The literal meaning is to point at some object in order to draw a conversational partner's attention to it; that is, to get them to look at it.

But you can also point out a particular argument in a newspaper article, for example, to draw your interlocutor's attention to it in a slightly more abstract sense: there is no need for them to physically look at this section of the text in order to consider the idea itself. Finally, you can point out a new idea that your friend had never thought about before, causing them not just to notice it but to suddenly understand a new perspective: yet another layer of abstraction.

One theory to explain this pattern is that our capacity for abstract thought and our capacity to communicate our ideas in language developed alongside one another, creating a positive feedback loop in which the way human language works is dictated by our cognitive architecture.

In turn, the workings of language itself affect this architecture, binding these two crucially defining human abilities inextricably together. Thus, the ability to talk to each other about physical objects and activities such as hunting and gathering could be repurposed to communicate about abstract notions such as understanding a new idea.

For instance, consider the multiple, but related, meanings of the English word "grasp". In doing so, the mapping between the two domains created by this process could make it easier for a brain that is good at reasoning about the concrete, physical world to improve at reasoning about the abstract world as well.

The preexisting ability to perform the former kind of reasoning and thinking is what makes one direction of metaphorical mapping ubiquitous and the other all but nonex-

istent. This is just one aspect of a number of ways in which human cognition is argued to be "grounded" in the physical world. The influence of linguistic structure on thought is easy to overstate. It does not seem to be true, for example, that the lack of a word for a concept means that it difficult to entertain the idea of that concept.

Different cultures happen to carve up the world in slightly different linguistic ways; this is neither surprising nor particularly interesting, from a cognitive perspective. However, the broader sense in which our language faculty and our faculty for abstract thought are linked has some intriguing implications for the way we think about and investigate the structure of the mind.

Emily Darley
First year PhD student

Alessandra Berti tells us... **speak your mind!**

ubu.org.uk/speakyourmind

WHEN I ran for welfare officer, I vowed to help improve students' experience of mental health. Several of my friends were struggling with mental health problems such as eating disorders, anxiety and depression. Others reported similar things of *their* friends. Last year's *Look After Your Mate* campaign tried to highlight student experiences, opening a conversation about how to best support friends who are struggling.

In terms of students and mental health statistics show that students are more likely to have mental health problems than the rest population. For the latter, the statistics say that one in four of us will have a mental health problem at some time in our lives. However, at Bristol, we haven't been collecting any data on students' well-being in a systematic way.

We know that 117 students define as 'disabled' due to mental health difficulties. We know that around 1400 students access the university's counselling service each year and that every fourth GP consultation at the student health service is related to mental health… but there are no comprehensive figures.

This term UBU has launched the *Speak Your Mind* survey, which seeks to capture students experience of mental well-being. One of the killer questions is how we can best support positive well-being. The answer doesn't always lie with (just) counselling or medication but can be through a culture change. Imagine your lecturers talking to you about the importance of self-care, talking about their own experiences of low mood. Or encouraging students to offer more peer-to peer-support, drawing on the resources we already have in the student body. If you want to help, fill in the survey soon — it is open until the end of January.

Be a cognitive *ACTIVIST*

I WAS secretly envious. My wife and I were visiting another couple, reminiscing about when we met our partners. The husband earnestly said, "The instant I saw her, I told my friend that I was going to marry her." And he did. I was dumbfounded, and left wondering why I didn't have such a revelation when I first set eyes on my wife.

That's pretty amazing. What's more amazing is the number of such stories. Can they all really be true? Obviously, it's hard to deny one's own memory of personal events. Or is it? If psychology has taught us anything, it's that the obvious is often completely wrong.

Most of my university training is in mathematics and computer science, relying on my brain as an engine for logical deduction. Then my research turned to neuroscience; I started to investigate the brain and learned about researchers like Elizabeth Loftus.

Loftus has made a career disassembling antiquated notions about memory – like, if you remember it clearly, then it happened. That turns out to be patently false. Confidence in a memory is not related to its accuracy, but rather to your emotional arousal at the time.

Even more insidious is that memories can be altered, or fabricated unintentionally. A horrifying misuse of memory occurred in the 80's, when a rash of accusations of sexual abuse and satanic rituals emerged. Consider the case of Kelly Michaels, a daycare worker in New Jersey. A boy in her care made a comment to a nurse during a physical exam. The nurse was rubbing his back while taking his temperature rectally. He said, "that's what my teacher does to me at nap time at school." This potentially innocent statement led to suspicions of sexual abuse, and an investigation which many of the children in the daycare were questioned. However, the interrogation techniques used were coercive and biased. Investigators asked leading questions that were suggestive of the alleged crimes. Moreover, questioning occurred over an extended period of time, with many children interviewed repeatedly. We now know that this is fertile ground for the production of false memories. Consequently, Kelly Michaels was convicted and spent seven years in jail. She was acquitted by an appeal that revealed the psychological pitfalls of those interrogation methods.

To this day, many people consider eyewitness testimony to

be strong evidence. Unfortunately, even honest witnesses could be speaking falsely.

It's not just memories. There are myriad ways the human mind can be deluded, and believe something that is false. Consider homeopathy, a form of alternative medicine in which an infinitesimal dose of a toxin is believed to relieve the symptoms that a larger dose would have caused. For example, if you're having trouble sleeping, a tiny dose of caffeine will help you sleep. In fact, the active ingredients are so dilute that the patient might not receive even a single molecule. Yet homeopathy is a thriving business. Why is that?

One of many likely culprits is confirmation bias. Suppose you believe you have exceptionally bad luck with traffic lights, hitting more than your fair share of red lights. It is highly unlikely that the traffic system is conspiring against you. Rather, we have a tendency to remember the occasions that confirm our beliefs, and forget the evidence that contradicts them. As you drive, each red light boils your blood – while you soar through green lights, unaware of your good fortune. The result is that you remember more red lights than green lights. Homeopathy proponents keep a list of testimonials from "cured" clients. However, the successes alone tell us nothing.

To find out if homeopathy really works, we need to step outside of the human brain and conduct double-blind controlled studies, systematically quantifying successes and failures. Indeed, the whole purpose of such studies, and scientific protocols more generally, is to remove human bias as much as possible. Once a therapy is found to be effective in this objective, scientific realm, it's no longer "alternative medicine" we simply call it "medicine".

The funny thing about the brain is that everyone thinks they understand how theirs works. But each person has very little knowledge about how they arrived at their beliefs. Judging the validity of one's beliefs is like asking a fish what it feels like to be wet. You simply don't have the facility to see your own mind from outside. This isn't obvious to most people, who continue with the delusion that their mind is trustworthy, and that their beliefs are rational and accurate.

It is our duty to point this out to friends, family, and the broader public – to help them understand the complex and fascinating relationship between reality and their mind. It is in our best interest to educate the public on these issues. In this age of climate change and religion-motivated wars, tolerating delusion could mean the end for us. It is time we became cognition activists. It's time we shone a light on the brain and all of its imperfections.

Dr. Jeff Orchard
IAS Benjamin Meaker Visiting Professor;
Associate Professor, University of Waterloo

What can we do about —MENTAL HEALTH— in Chinese high school students?

NOWADAYS, China is challenged by the urgent demand of mental healthcare for children and teenagers. As of 2008, there were 240 million children under age 14, which accounts for 8% of the total population. The Chinese Association for Mental Health reported that at least 30 million children and teenagers have mental health problems. This number continues to grow. However, if they have a positive mentality, students can increase their efficiency and have better academic results.

Common problems

Five psychological problems are common among Chinese high school students: maladjustment to school life, obsession disorder, depression, anxiety, and phobias, such as social phobia. Nearly 80% of students have been plagued by one or more of these. Interventions by teachers and parents during this critical period may allow students to adjust themselves. Unfortunately, they often judge a student only by their academic performance, which can worsen the problem.

Maladjustment

Difficulty in adjusting to school life is common among students. Those affected may fall behind their peers academically, which can result in suspension or dropping out. It can cause emotional, behavioural and physiological problems.

Emotional symptoms include depression, anxiety, obsession, and boredom. Specific actions take the form of being afraid of learning, being distracted during lessons and having homework problems. At the same time, however, students are still expected to have good grades. Such a situation may cause anxiety and depression.

Four main behavioural problems are observed. First, inhibition of learning abilities. Many students find it difficult to concentrate on studying. Secondly, the decline of social activities. There will be less communication with classmates, less speaking during lessons and less extra curricular participation. Such students isolate themselves from their peers.

Thirdly, antisocial behaviour. Teenagers seek addictive activities, such as computer gaming or smoking. Finally, regression: sometimes they may act like children. They are also socially isolated because they do not share interests with other students.

Some students may feel dizzy and have difficulty sleeping. Back pain, heart palpitations and faintness are also reported. However, physical examinations usually fail to find any problems, suggesting this is psychological. ➔

case one

Deng, a 17-year-old male from a key high school in the Hubei province

Hubei province is famous for its examination-oriented education system. Keen competition between high schools brings a lot of pressure to students. Also, the amount of daily homework is extremely high. Deng's high school has been in the top three in the province's college-entrance examination for five years. Such achievement resulted from every student's hard work. For example, Deng revised from 7.20 A.M. to 9 P.M. His 'working week' was from Monday to Saturday. Under such a burden, Deng faced obsession, depression and slight phobia of social activities. The main causes were stress from revising and the lack of communication with parents. So far, Deng is getting better with relatives' help.

case two

Tao, a 17-year-old female from a key high school in the Jiangsu province

Extra classes are strictly forbidden in the province. Teaching times are from Monday to Friday and there are no compulsory night classes. Tao suffered from severe depression. She felt depressed since she did not do well in exams, but the main cause was a lack of communication with her parents. After using medication for a year, she finally recovered. Her academic achievement was greatly affected.

case three

Yang, a 17-year-old male from a key high school in the Jiangsu province

Yang was the top student in his first two years of high school. However, as a very serious person, he didn't get along very well with classmates. In his third year, he suffered from phobia of classmates and teachers. Finally he turned to home-schooling. His problems arose from inappropriate relationships with other students. He should be responsible for himself; however, parents and teachers, who did not realise the hidden problem under good academic achievements, should also take responsibility.

case four

Zhou, a 17-year-old male from a key high school in the Jiangsu province

Zhou is an undisciplined student who didn't care about school rules. As a result, he always had conflict with teachers. He shows average studying ability but a strong ego, which caused an abnormal relationship with classmates. Finally, he had phobia. His problems mostly resulted from himself. However, also part of the cause was his teachers and classmates not giving enough help but just indulging him.

Discussion

According to a university report, 16.2% of students show an abnormal psychological state, which are often remnants of high school psychological problems. Mental development during high school period is vital. It is a period of time when students start to be independent, get rid of parental control and form personal thoughts and plans. It is also when parents and teachers are still close enough to students so that they can give guidance and show care.

For students, they begin to form their values, personalities and style of communication during high school. This sets up the base for a free and independent university life. At the same time, parents are still close to their children geographically and in contact frequently.

Teachers and classmates are much closer to students in high school than in university. There are a limited number of people in one class so a teacher can be more aware of a student's development. Besides, all students have the same class together.

In conclusion, high school is not only a vital phase for student's mental development, but also the best phase to help students build a healthy mentality. If students can form a positive attitude in high school, they will adapt to university better.

Further Directions

Training of teachers is necessary. They should care about students' academic results as well as their mental condition. They should also be aware of common psychological problems and treat students equally. This can be achieved by communicating with students regularly (based on the condition of the student), or choosing students with a good mentality (not necessarily good academic results) to help others. The school should set up basic mental health lessons to make students aware of the importance of mental health.

From the parents' perspective, they should try not to control their children but rather listen to their opinions. They can read some psychology books and learn some tips for overcoming generation gaps. They can also help children with their studying by making plans together or setting up prizes. The important thing is to make the marks the aim of the children, not the judging standard for parents.

Meanwhile, cooperation between parents and teachers is very important. As students are experiencing high-speed development both physically and psychologically, they often show rebelliousness. However, this does not mean they are irrational. Teachers and parents should treat students seriously and not dismiss their ideas.

From the students' perspective, a good academic result can build confidence. Such results come from two aspects: students' personal thinking and communication with

others including parents, teachers and students. In doing so, the teacher-student, parent-child and classmate relationships will all be developed in a positive manner.

Hanyu Dong
Third year
BSc (Hons) Psychology

SUMMER IN SRI LANKA

Third-year undergraduates Lana and Lora reflect on their clinical work experience abroad

SLV international is a volunteering organisation specialising in degree-specific programmes in Sri Lanka. They offer a wide range of opportunities such as working with people with special needs and those within the mental health sector. In addition, the 4- to 12-week programmes they offer are very affordable, as volunteers live with Sri Lankan families during their stay.

Their psychology placement is ideal for those reading for a psychology degree and interested in a clinical psychology career. It involves working within the National Institute of Mental Health (NIMH) and a halfway house for women with mental health difficulties, as well other community projects, such as teaching English, and working in children's homes. The placement runs in conjunction with the King's College London department of 'Samutthana', the resource centre for trauma, displacement and mental health in Sri Lanka.

In addition to working at the hospital, volunteers attend therapy workshops, field trips with leading psychiatrists and receive a written personal reference upon completion of the programme. Finally, past volunteers are invited to psychology seminars in the UK.

Lana's Experience

Both the diagnosis and treatment of psychopathology is greatly dependent upon where in world it is experienced. As we know, mental health is diagnosed on the basis of self-report, or on what others say about the individual. Thus, socioeconomic, cultural and even religious factors can affect the diagnosis and ultimately the treatment. This is a

realisation I had during my time with SLV.

We learned that, in the last half-century, the suicide rate in Sri Lanka had risen from a modest level to one of the highest in the world - nearly five times that of India. The country is also seriously lacking in trained mental health professionals – Dr. Jeurgen, a leading Sri Lankan psychiatrist, sees thousands of patients monthly. This may be attributable to cultural stigmatisation of mental health; many people refer to him as the 'mad doctor'. Another factor is the lack of appropriately taught psychology degrees in Sri Lanka: the only postgraduate course of study resides is heavily influenced by spiritual and religious teachings, rather than being grounded in the scientific method.

On a field trip with Dr. Jeurgen, we witnessed first-hand the high demand for psychiatric treatment; due to time constraints we saw each patient for roughly five minutes. Most patients were given routine injections to treat their 'schizophrenia'; Asian diagnostic tools are particularly biased towards this judgement.

A female patient who arrived with her newborn baby was especially memorable. She expressed what seemed to be post-natal depression. Since medication would affect her breast feeding, she was instead admitted to the mothers and babies ward of the NIMH for ECT. The incident really highlighted the need for trained therapists and alternative treatments. Dr. Jeurgen expressed that CBT or psychotherapy would be a better option for most of his patients; however, it isn't available in the public sector.

SLV exposed us to many treatment techniques not often considered in western cultures, including meditation. Until recently, such meditation has existed primarily in temple settings, but its implementation in mainstream mental healthcare has proved effective, especially in the treatment of depression. The Buddhist practice of consciously identifying impure thoughts and modifying them is in fact very similar to aspects of western CBT.

Finally, we were given the opportunity to take part in a drama therapy workshop, which complimented our work on the occupational therapy ward of the NIMH. Prior to this, I had not realized the value of drama and art in a therapeutic context, but the otherwise inactive and unentertained patients really responded to such activities. At that point, the language barrier had to be overcome; I think all volunteers agreed that developing the ability to appropriately communicate without language is valuable and relevant in any culture.

Lora's Experience

When I arrived in Sri Lanka for my placement, I didn't know what to expect. I knew the experience was

going to be challenging, but I had no idea just how rewarding it would be. During my five weeks, I spent two days a week split between the NIMH and at the halfway house. The rest of my time was spent at teaching projects for children and young adults, and at a home for adults with physical and mental disabilities.

Each week, volunteers are allocated to different wards at the hospital, including acute, occupational therapy and learning disability. The variety really gives you a broad experience and understanding of different mental health conditions and their treatment procedures.

I learnt about the complete mental health process, from admission to diagnosis, treatment and, for some patients, discharge. The hospital staff were always happy to give advice on patients to help with therapy sessions. In addition, we were invited to attend workshops run by Samutthana on a variety of topics, including morbid jealousy, a topic which I had never come across before.

The mental health system in Sri Lanka could not be further from what we experience here in the UK, and this experience gave me the opportunity to learn all about how mental health is treated and viewed in another area of the world.

SLV Student & Graduate Placements Abroad

As if this wasn't enough, volunteers finish work at midday on Friday and have the whole weekend to travel! Sri Lanka is one of the most beautiful countries I have ever visited, with something for everyone. During my time, we visited white sandy beaches, elephant orphanages, ancient cities, temples and so much more.

The SLV experience was truly rewarding, in terms of learning about the mental health sector as well as my own personal growth. I learnt more about teamwork and leadership by putting myself in situations which you would never find in the UK, and I truly feel like I have come back a better person.

I would urge anyone interested in a further career in psychology to look into SLV summer programmes, as I doubt you'll find a more hands on and inspirational work experience. I came back from Sri Lanka with tons of amazing memories, a wealth of new experiences and new friends that I'll keep for life.

To find out more about the SLV Psychology Placement in Sri Lanka, come along to the information talk on the 26th February, Arts Complex Room G77A, Woodland Road at 1-2pm

You can also visit www.slvolunteers.com

Lana Crick &
Lora Thomson
Third years
Bsc (Hons) Psychology

facebook *won't* get you more friends

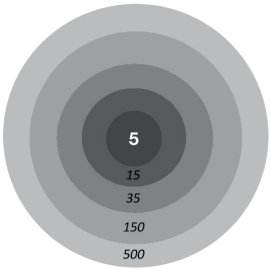
Review and ***Q & A*** *with* Robin Dunbar

FACEBOOK was 'sold' to us on the promise of enlarging our social worlds, but has it? Professor Robin Dunbar, of the University of Oxford argues 'No'. Although you may boast a Facebook friends list of hundreds, the number of maintained friendships remains near constant. The typical number of friends still averages 120-130.

So, why haven't our social worlds grown? You might think that the more people you're connected with through Facebook, the more friends you are able to make. However, the Social Brain Hypothesis claims that humans, like other animals, can only have a limited number of relationships. A ratio of body and neocortex size was compared with average group sizes of different animals. It seemed that as the neocortex increases in size, the number of sustained relationships also increase. Using this relationship, humans were predicted to have a 'group size' of 150, the so-called Dunbar's number.

There is compelling evidence that human group sizes fall around this number. Neolithic villages numbered 150-200 individuals, modern army companies are composed of 180 and even the average Christmas card network is close at 154.

Dunbar suggests there is a hierarchical system ranging from a small 'inner circle' of 5 people, to large numbers of those we know less well. Within the same circle, our relationships with different people can vary in frequency and type.



On average, half of our social networks are family members. It follows, then, that people with larger families tend to have fewer friends; this was supported by Dunbar.

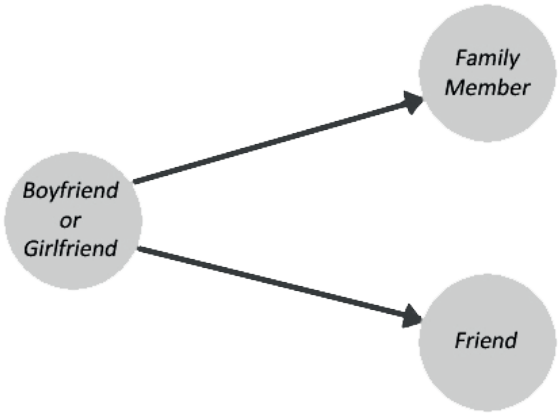
Families are important in our social circles. For instance, sixth formers, leaving for university, rated their closeness with friends and fami-

lies over time. Families maintained closeness as friendships tend to decrease in strength.

Along with friends and family, romantic partners can form a fundamental part of our social worlds. However, the inclusion of a partner means we are adding a sixth person to our circles. Studies suggest that a romantic relationship has an even greater effect than a new friendship. We typically sacrifice two connections. This tax on our circle limit seems to stem from limited resources, such as time.

Limits on circle size seem to be well-supported in examples of early and modern human life. If this is the case, it seems logical that there would be a biological basis for our social behaviour. Dunbar suggested the involvement of the endorphin system.

Endorphins are important in the grooming behaviour of chimpanzees, the main way of maintaining social groups. Following this behaviour, opiates are released into their bodies. The opiates are thought to act as a reward, providing satisfaction from the social interaction. Further, this blocks their social drive, possibly because it cues them that their needs have been met. Conversely, the use of opiate blockers increases the time spent grooming as the chimpanzees still strive to satisfy their social needs.



How does this translate to the maintenance of social relationships in humans? Dunbar used this data among others to predict the 'grooming time' of humans. It was expected to consume approximately 43% of our waking hours, an infeasible period of time, given the other tasks we must accomplish. Upon further study it seemed this was an over-estimate, as social time only accounted for 20% of our time. Is there another explanation?

A key difference between humans and chimpanzees is our grasp of language. It allows the transmission of complex ideas as well as relatively easy maintenance of social bonds. A further contrast between grooming and speaking is that we may hold a conversation with several people at once. This could account for the difference in 'grooming time' between that predicted by animal research. Conversations may give humans the same opiate- and endorphin-based satisfaction.

Dunbar suggested that the key to this biological need satisfaction lies in the laughter that results from social situations. His research has shown greater relationship satisfaction when using the virtual face-to-face contact of Skype rather than instant messaging. Even in Facebook chatboxes, using emoticons was linked to greater social closeness.

While social closeness might be motivated by our biological reward systems, there are other ways of achieving an endorphin rush. Dunbar suggested that it was not just the release of endorphins, but rather the synchronisation of social contact. A study of rowers showed that group, rather than solo, work-out led to an increase in endorphins.

Dunbar's research is undoubtedly grounded in several strands of research. The theory seems plausible from a biological perspective and intuitive in terms of our own social experiences.

Q&A

What purpose does Facebook have, if not for widening our social worlds?

Facebook is certainly not without its use. It allows the maintenance of long distance relationships and has been shown to slow the decline in closeness over time. However, it is possible that by maintaining these previous friendships, new ones could be prevented from developing. This might mean that long distance relationships are less useful, especially in situations like a break-up, someone miles away will likely be less help than a friend down the road.

If the potential network size for humans is the same, or similar, why does the number of Facebook friends vary?

The differences in friend list sizes might be due to personality differences. Those who are high on measures of extraversion usually have larger friend lists, for example. The other point is that those with larger networks have a trade-off between the number of relationships and the closeness of the social connections.

What advice would you give to students looking to work in this area?

There is no clear path into the type of research that is conducted on these topics as it draws from across several disciplines. If someone was looking to work on this research, it wouldn't matter too much which field they were coming from. Overall, it is most important to work from your own knowledge – from other areas of research and just from your own thinking.

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