

MAZE

Issue 1: Editorial Letter...

You are holding the first issue of School of Psychology and Neuroscience newsletter! The title Maze has many meanings, especially in psychology. We picked this title because the human brain and mind are often said to be the most complex network in the universe, just like a maze.

A classical psychological experiment is a white rat running through a maze trying to find the next treat, just like new undergraduate students trying to find their way in the complexity of the School's building! The team we have at the moment is very small and we worked very hard to get this first issue for everybody before revision for exams, when you will have to run through your own mazes and solve your own puzzles! We did not pick any theme for this issue, we are just happy to present you some interesting facts and news from the world of psychology, recommend you a few books, get you more excited about statistics and encourage you to join our team!

--- Sarune ---

Psychology News: Brain scans predict who's likely to repeat criminal offence

The interaction of psychology and neuroscience with legal system and the courtroom has been a 'hot' topic since the first brain imaging techniques emerged. Legal and ethical debate aside, parole and probation boards are dealing with everyday risk assessment trying to determine if the person in question is likely to repeat the offence. Brain scans are emerging as one of the diagnostic tools to aid the legal system. Kent Kiehl, a professor in Psychology from University of New Mexico has explained his research to npr.org (where you can find the full interview). Professor Kiehl's research lab is working with the offenders and trying to examine their predisposition for impulsivity. Prof Kiehl thinks that impulsivity is one of the key variables in the likelihood if the person has an increased risk of reoffending. The lab has devised an interesting experiment. The participants are instructed to press the button every time the letter X is presented, however, when the letter K is presented the participant must not press the button. Using brain imaging techniques, Prof Kiehl and his colleagues have discovered that participants who show more control in the experiment (ie. do not press the button when the letter K is present) show reduced impulsivity and are less likely to reoffend. The research is still in progress, but it sounds promising. It seems that our predisposition for impulsivity and criminal offence does indeed lie in our brain structure and chemistry.

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Special Thanks to Akira O'Connor for making stats exciting!

...BIZARRE.....

Psychological Conditions

by Giedre Cepukaityte

Capgras syndrome (also known as Capgras delusion)

Capgras syndrome was first described in 1923 by Joseph Capgras and Jean Reboul-Lachaux. The most striking symptom of this rare condition is that sufferers believe their close friends, family members, spouses and even children have been replaced by identical-looking impostors. One of the possible explanations for this condition is that one of the face recognition pathways responsible for emotional response to familiar faces is somehow impaired. Lack of emotion leads patients to believe that faces belong to doubles rather than their actual loved ones.

De Clérambault syndrome (also known as erotomania)

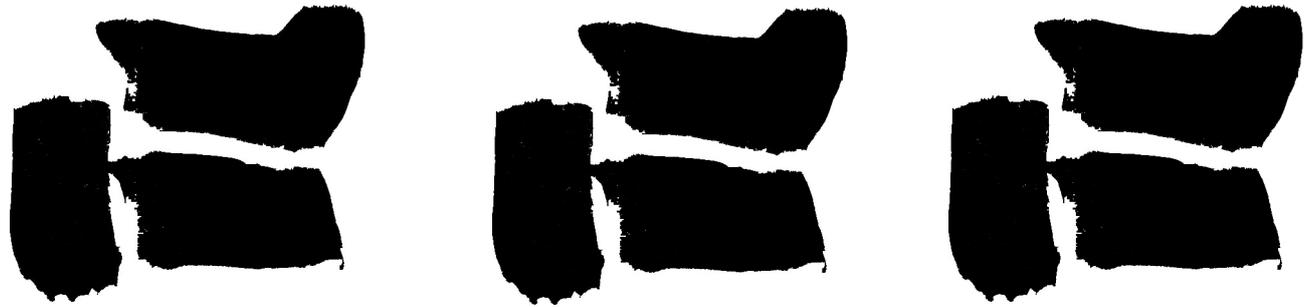
The de Clérambault syndrome is another rare condition named after a French psychiatrist Gaëtan Gatian de Clérambault. Although de Clérambault was the first to isolate the features of this condition, it was earliest described by Hippocrates. The syndrome occurs both in men and women and manifests itself as strong delusional beliefs of the sufferer that a person of opposite gender is seriously in love with him or her. Delusions can last from weeks to months and can lead to stalking and even violent jealousy which is more common in men.

ART, PSYCHOLOGY & SCIENCE

by Sarune Savickaite

The Dialogue between art, psychology and science has been a fascinating research question for centuries. Finding the connection between all of these disciplines has been a mission for many thinkers, scientists and artists. The topic is so unique and broad many have attempted to combine and find a link between these disciplines, however, just like the complexity of the brain itself - the topic of art, psychology and science combining together seems too interconnected and complex in nature. Carl Von Rohitansky of Vienna School of Medicine has postulated that the mind and the essence of the human soul is to be found under the skin. The concept of deep and hidden nature of human mind persisted into the 20th century. Sigmund Freud, grandfather of psychology, has tried to explain the human mind by dividing it into the conscious and unconscious. The Freudian school of thought influenced many artists and thinkers and attempted to explain the essence of human nature and the complex mind. However, the memories and perceptions of each individual are different and the way each of us view the world and any piece of art is unique. The brain is like a creative machine converting and making sense of the information that we are presented with. We now know about mirror neurons and how we recognize human faces. The moving and exaggerated features of many paintings speak to us and now we have a scientific explanation why. However, can we really say that this is the missing link between the disciplines? Can a scientific view explain what we feel when we view the greatest portraits and landscapes? Perhaps we need one more century to get the explanation we are hoping for.

To read more about the dialogue of the disciplines please see: Eric R. Kandel (2013) What the brain can tell us about art. The New York Times.



Friday the 29th February saw the St Andrews Psychology Department play host to the historian Sönke Neitzel, who was approached to give a talk on the subject matter of his book 'Soldaten: On Fighting, Killing and Dying: The Secret Second World War Tapes of German POWs'.

The book, written by Neitzel and the social psychologist Harald Welzer, is an analysis of transcripts documenting secretly recorded conversations between German prisoners of war. The transcripts, as well as being of great use tactically throughout World War 2, also reveal invaluable insight into each prisoner's psychological state throughout their imprisonment. Neitzel and Welzer were able to analyse the prisoners' attitudes and opinions on a variety of subjects including their enemies, the Holocaust as well as WW2 as a whole. Many simply saw themselves as tools needed to achieve bigger things and often rationalised their behaviour, including in some cases, mass executions and rape, as an attempt to hit 'targets'. The source material also revealed that nearly all German soldiers knew that Jews were being murdered en masse as part of the Holocaust. This contests the commonly held belief that only the SS had true knowledge.

Neitzel's talk focused mainly on what they term as each prisoner's 'frame of reference' as well as the idea of group belonging and shared 'Nazism' ideology as a starting block towards explaining why German soldiers were able to act so inhumanely. We are therefore able to draw parallels between 'Soldaten' and Steven Reicher and Alex Haslam's theories on the idea that people become evil only once they have identified with an evil ideology. We can also consider Hannah Arendt's work on the 'banality of evil' where she discusses the idea that the greatest evil acts were committed by ordinary people who accepted their situation and were simply following orders.

Neitzel also discussed the methodology used to analyse the 100,000 pages of evidence, twice as extensive as the British files in the National Archives in Washington DC. Much of the material was digitised and analysed using content-recognition technology. In previous decades this would not have been possible, highlighting a potential reason as to why this evidence has only recently come to light. All in all, I found that the talk subject matter was controversial and different enough to keep the audience interested and yielded previously unheard of insight into a historical event which continues to be studied to this day.

Sönke Neitzel review

by lauren williams

So, what is Neuroscience? It is broadly defined as the study of the development, structure and function of the nervous system, both in health and disease. Neuroscience is highly interdisciplinary, incorporating elements of different areas from biology and, of course, psychology to computer science and engineering.

While neuroscience may at first seem a specialised subject, there are many diverse fields of study. Take, for example, clinical neuroscience, which explores the mechanisms underlying diseases and disorders of the brain; or paleoneurology, which, as the name suggests, brings together paleontology and archaeology to study how the brain might have evolved.

Neuroscience is a relatively new branch of science and its implications are wide-ranging. Its study is necessary for greater understanding of the underlying causes of brain diseases and disorders, which should in turn advance the search for cures for such conditions. Simply understanding how the brain works, even when healthy, is likely to impact upon many aspects of society, just one example being how we learn and teach.

NEUROSCIENCE

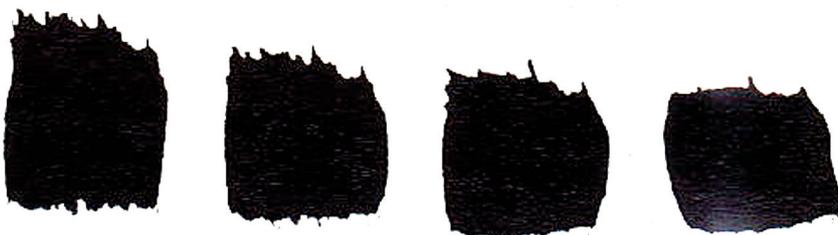
by kirsten napier



Current neuroscience research at the University of St Andrews is carried out by the Institute of Behavioural and Neural Sciences (IBANS), which is comprised of researchers from the Schools of Biology, Psychology, Medicine and Chemistry. One of the most recent publications from IBANS concerns components in the signalling pathway of hippos, while another relates to the prevention of amyloid induced neurodegeneration, which is central to the development of Alzheimer's disease.

In a recent interview*, Professor Uta Frith of the Institute of Cognitive Neuroscience at University College London cited the development of functional magnetic resonance imaging (fMRI) over the past twenty years as the single biggest advancement to neuroscience. fMRI indirectly measures activity in the brain by measuring changes in blood flow, which can be detected by scanners due to the magnetic properties of iron which is present in the haemoglobin of red blood cells. This allowed researchers to 'see' what is going on in the brain as it is functioning for the first time. fMRI is not without its critics, however research methods are continually advancing, so who knows what developments in this exciting and fast-paced science we will see in the near future.

(*as a guest on Dara O Briain's Science Club (BBC2), 4th December 2012)



BOOK REVIEW by Polina Arbuzova

OLIVER SACKS

THE MAN WHO MISTOOK HIS WIFE FOR A HAT AND OTHER CLINICAL TALES

The book 'The Man Who Mistook His Wife for a Hat and Other Clinical Tales' by Oliver Sacks was published in 1985 and is still extremely popular all over the world. Oliver Sacks is a British physician, neurologist and author of more than 10 books, including An Anthropologist on Mars, Musicophilia: Tales of Music and the Brain, The Mind's Eye. The book inspired a pop band 'Travis' and one of the albums were both named 'The Man Who..'

The book consists of 24 short stories about patients who experience a variety of unique neurological disorders. The four parts of the book are: 'Losses', 'Excesses', 'Transports', and 'The World of The Simple'.

Sacks discusses neurological aspects as Korsakoff's syndrome, Parkinson's disease, aphasia, agnosia, damaged proprioception, savant syndrome and many more.

Sacks has a humanistic and empathetic attitude towards his patients. The description of his own feelings as well as his patients makes the book very personal and the reader is taken on the journey from the clinicians perspective.

The book is truly inspiring. It raises questions such as what does it mean to be human, what is will power, what are our values?



BOOK REVIEW by Lisa Felix

RITA CARTER

MAPPING THE MIND

'Mapping the Mind' by Rita Carter was suggested by Lin Maclean for her second year clinical neuropsychology module, and having read it I'd like to further recommend it to anyone interested in her topics and other areas of neuroscience.

Carter's writing style is light and at times humorous, and she explores the relationship between the brain and the mind in a way that is interesting and easy to follow, even for those without a biological or scientific background. She covers many bizarre disorders such as alien limb syndrome, during which a patients arm or leg takes on a mind of its own after the two hemispheres of their brain become separated. This leaves the dominant left side in charge of the patient's conscious mind while the right controls the alien limb. Carter uses many real life examples (including a man that permanently sees the image of his own head floating ahead of him), which makes 'Mapping the mind' one of the lightest and interesting scientific reads that I have come across.

REAL LIFE STATS: how (not) to win at roulette

by Akira O'Connor

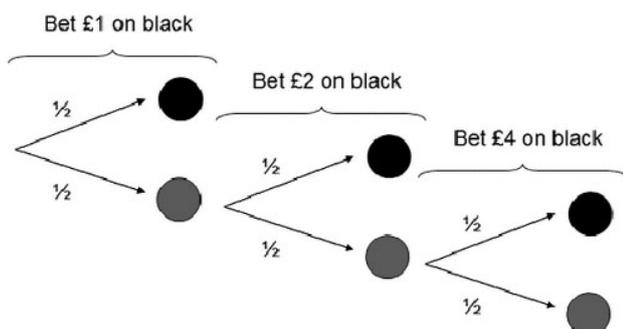
Roulette is a straightforward casino game. While the wheel is spinning, a ball is released. This ball eventually ends up stopping in a numbered (1-37) and coloured (red or black) pocket. You bet on the final resting place of the ball by selecting a number, range of numbers or a colour. When betting on colours, if you pick correctly, you double your money. A £20 stake on black would get you £40 back if the ball landed in a black pocket, and nothing back if it landed in a red one.



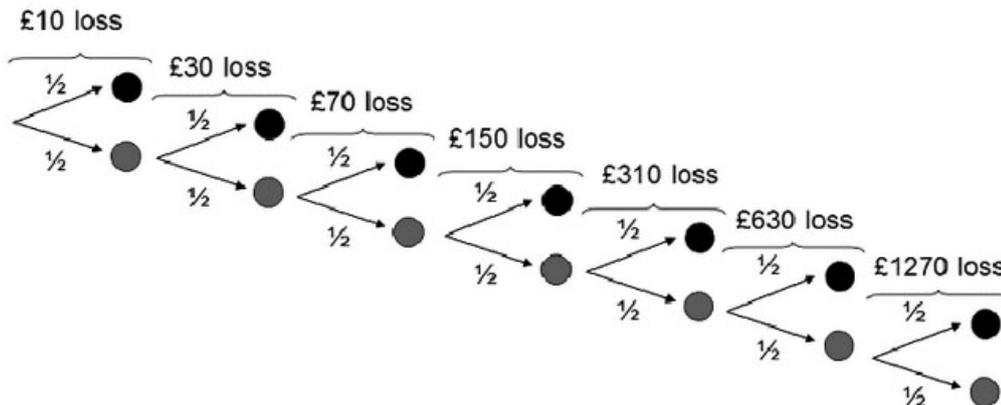
A few years ago, I received quite a few spam e-mails with the following tip on how to win at roulette.

- >So I found a way you can win every time:
- >bet \$1 on black if it goes black you win \$1
- >now again bet \$1 on black if it goes red bet \$3 on black, if it goes red again bet \$8
- >on black, if red again bet \$20 on black, red again bet \$52 on black (always multiple
- > you previous lost bet around 2.5) if now is black you win \$52 so you have \$104 and you
- >bet: \$1+\$3+\$8+\$20+\$52=\$84 So you just won \$20
- >now when you won you start with \$1 on blacks again etc etc. its always
- >bound to go black eventually (it's 50/50) so that way you eventually always win

If you ignore the atrocious spelling and grammar, the basic idea seems to be a good one. In fact, it's an established betting strategy known as the Martingale system. Under this system, you double losing bets until you win, that way you will always win an amount equivalent to your first stake. If we build a probability tree for a gambler who only bets on black and provide her with a fairly standard outcome, two losses followed by one win, you'll see how this is meant to work.



Over three bets, she has spent £7, but won £8. Not too shabby. She just needs to do this over and over until she has won an amount she's happy with. Fool-proof, right? Not quite. Casinos have stayed in business over centuries for a reason: they know how to work probabilities. One of their standard strategies is to have minimum stake limits, with a typical range of £10-1000. These limits expose a huge flaw in our spam-based strategy. Imagine you're trying the Martingale strategy and you go on a losing streak. £10, £20, £40, £80, £160, £320 and £640 all go on losing bets and all of a sudden you're down £1270. Here's where you come up against casino's maximum bet policy. You can't place a £1280 bet to recoup your losses. But how likely is losing 7 bets in a row?



Not very likely at all, if you're only trying to win £10. According to the multiplication rule for independent events, the exact odds are $(1/2)^7$ which is equal to .0078. Put another way, the probability of this happening is 1 in 128.

But problems arise when you try to make more than £10. To understand the next set of calculations, we need to reverse the probability of losing and think about how likely it is that we will win £10 each time we try. Using the addition rule for mutually exclusive events, we can calculate that the probability of winning £10 is equal to the probability of not losing:

$$p(\text{win}) + p(\text{lose}) = 1$$

$$p(\text{win}) = 1 - p(\text{lose})$$

$$p(\text{win}) = 1 - 1/128 = 127/128 = .9922$$

We can now work out the probabilities of making various amounts of profit, once again using the multiplication rule:

$$\text{£20 profit} = (127/128)^2 = .9844$$

$$\text{£100 profit} = (127/128)^{10} = .9246$$

$$\text{£200 profit} = (127/128)^{20} = .8548$$

But here's the kicker. If you want to double the money you bring to the casino to place these bets, you're looking at close to a 2 in 3 chance that you will lose everything.

$$\text{£1270 profit} = (127/128)^{127} = .3693$$

'I'm not greedy!' I hear you cry. 'I'd just want to go home with a little more than if I had invested the money and not had any fun at all'. Let's say you wanted to take home a little more than, 6%, the best savings interest rate you can currently find on moneysupermarket.com. How much would you need to win?

$£1270 \times .06 = £76.20$

You would need to win 8 times in a row to go home with a little more than a 6% interest rate. And what are the odds of this happening?

$£80 \text{ profit} = (127/128)^8 = .9392$

Put another way, 15 out of 16 times, you will exceed a savings account interest rate. You will enter the casino with £1270 and leave with £1350. But, 1 in 16 times you will leave the casino with nothing. Not even enough to get the 99 bus back to the Tay. Sadly, this sort of things is all too common, especially when people are new to gambling and think they have found a way of beating the system, e.g. goo.gl/3Th40

Even if you find a casino with no maximum bet, you need huge financial resources to make it work. It all starts to seem even more hopeless when you factor in something I neglected to mention at the start. Your odds of winning are actually worse than 50%. If the ball lands on 0 the casino takes all the money.

The take home message? It's probably best to ignore financial advice you read in your spam folder.

GREAT MINDS OF PSYCHOLOGY

The section 'Great Minds of Psychology' is going to be our ending note for each issue of MAZE. We learn about the theories and ideas of the great psychologists throughout history, however, we don't really know much about them as individuals. This last bit of the newsletter is going to be dedicated to those greatest personalities that have enabled us to study and understand the human mind.

Sigmund Freud
(1856- 1939)

Sigmund Freud was an Austrian neurologist and the most controversial and influential psychologist in history. The Vienna educated physician studied under Josef Breuer, who was treating hysteria with the help of hypnosis. Soon Sigmund Freud opened his private practise and married Martha Bernays with whom he had six children. The most influential work published by Freud was 'Interpretation of Dreams' (1900). However, the basic ground and summary of his theories were written and published by his daughter Anna after his death. Even though many of Freud's colleagues disagreed with his approach he soon established a following of students. In 1910 Sigmund Freud and Carl Jung founded International Psychoanalytic Association. Later Jung broke the relationship with Freud and worked on his own theories. This strange relationship of respect and hatred between the two great minds of the 20th century are explored in a recent Hollywood movie 'A Dangerous Method' where Freud is played by Viggo Mortensen and Jung is Michael Fassbender. During the WWII Freud moved to London with his family, however, he was diagnosed with a cancer of the jaw and had over 30 operations before he died in 1939. (reference: bbc.co.uk) If you are interested in reading more about psychoanalysis and its interaction with neuroscience we recommend: Bentel, Stern & Silbersweig (2003). The merging dialogue between psychoanalysis and neuroscience: neuroimaging perspectives.

