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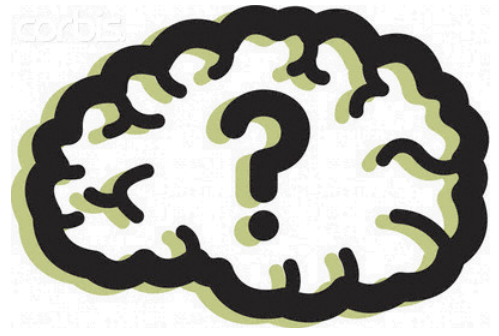
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The Mysteries of Psychology



The Enigmatic Issue



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Editor's Letter



The present issue of Psychout is centred on some of the various mysteries related to Psychology. Although not exhaustive it is hoped that the reader will get a taste of some of these interesting phenomenon from the past, present and even the future of the discipline. It should be noted that the articles contained in this issue were forged by our writing team during exam season. Therefore, perhaps the biggest mystery of all is how they managed to do this without their brains going on strike and escaping by squeezing out through their ears! Therefore it falls upon me to congratulate them yet again for their effort on this issue, wish them the best of luck in their results, and suggest they don't do anything too strenuous with their brains for a while...

Alex Reid, Psychout editor

Alex Reid



Meet the Team



Marianne Cezza



Hannah Voss



Grace Rice



Ivan Alvarez



Hannah Belcher



Francina Clayton



Cassie Barton



Features

Our Features Section is where large topics in Psychology are discussed. Previous articles include the history of Psychology, the effects of alcohol on behaviour and autistic savants...

Hitting the God spot: The burgeoning field of Neurotheology

Ivan Alvarez

Finding where God resides in the brain sounds like a tall order, but such is the objective of the new field of neurotheology, where modern neuroscientific equipment is used to study religious experiences. Originally used by Aldous Huxley in his utopian novel *Island* (1962/2008), the word 'neurotheology' meant the study of the relation between mystical truths and the nervous system, used somewhat mockingly to mean a blending of philosophy and science. Today it is used to mean a more rigorous study of neural phenomena and their relation to the subjective percept of religious experiences. While exciting and rapidly growing, the field is not without detractors who decry it as pseudoscience and fundamentally biased.

The first modern studies of neurotheology were carried out by Michael Persinger and his associates who set out to study which regions of the brain might be intrinsically related with religious, spiritual or mystical experiences (RSMs). Participants were recruited for a 'relaxation' experiment, introduced to a dark and quiet room where they asked to wear a helmet equipped with electromagnets (later known as the 'God helmet'). Here they rested while prolonged low-field magnetic stimulation was applied to the brain. After these sessions a surprising 80% of participants reported experiencing one or more 'presences' in the room (St Pierre & Persinger, 2006).

The theoretical frame for this experiment was inspired from earlier psychiatric work, which had observed that epileptic patients reported extreme feelings of religiosity during temporal lobe seizures.



Subjective religious experience is controversially examined as a psychological phenomenon

Persinger's claim was that increased temporal lobe activity lead to an increase in RSMs and this could be induced by magnetic stimulation of the brain. Highly controversial, this idea was disputed and subject to fervent debate. In 2005 a Swedish research group conducted a double blind study attempting to replicate Persinger's findings, and despite implementing the same procedure and equipment, they were unable to replicate any effect of magnetic stimulation on RSMs (Granqvist et al., 2005). Persinger's reputation was further undermined when it came to the public light that a version of his original apparatus, the so called 'God helmet', was made available commercially to generate altered states of mind through a commercial venture, Shakti Technology (www.shaktitechnology.com). The validity of Persinger's claims are still subject to debate as no other research group to date has successfully replicated his findings.

The first decade of the 21st century ushered in a new perspective and new methodology to neuroscience, where non-invasive imaging techniques were being applied to answer a number of questions regarding our more complex behaviours, thoughts and emotions. Andrew Newberg was to transport the field of neurotheology into the realm of neuroimaging. His early studies used single photon emission computed tomography (SPECT) where the participant is injected with a radioactive isotope, decaying inside the body and emitting particles detectable by an array of sensors. The rationale for the studies was simple, if the temporal lobes are indeed involved in religious experiences then a SPECT scan of someone engaged in religious behaviour would reveal higher neural activity in temporal areas when compared to a resting state. This idea was explored on three Franciscan nuns and six Tibetan Buddhist monks who were scanned while both performing meditation and when at rest – surprisingly, no difference was found in their temporal lobe activity but instead in other areas across the brain (Newberg, Pourdehnad, Alavi & d’Aquili, 2003). A study by Beaugard & Paquette (2006) showed similar results for Carmelite nuns in functional magnetic resonance imaging (fMRI), indicating that religious experiences are a complex, widely distributed operation, at least on the neural domain.

Clearly RSMEs are multifaceted experiences, where several cognitive processes come into play including mental imagery, memory, emotion and the representation of the self to name a few. But despite this it has been possible to link RSMEs with specific differences in cognitive processing and performance. A study by Short et al. (2007) compared short and long-term practitioners of meditation with fMRI while resting or performing quiet meditation. Interestingly, they displayed no overall difference in brain activation but when specific attention-related areas were probed, long-term meditators showed longer, more consistent activations. Short et al. suggest that meditation alone may enhance specific subcomponents of attention, specifically the ability to maintain attention and avoiding wandering our attention and thinking of something else.

‘ Franciscan nuns and Tibetan Buddhist monks were scanned while both performing meditation and when at rest...’

But what about the majority of us, who have not practised meditation for a decade or more? In a surprising new study fourteen participants who suffered from memory problems were instructed on how to perform meditation and underwent SPECT scans before and after 8 weeks of training. Remarkably, the resting state scans before and after training differed significantly, revealing overall enhanced activity after training. Also, their scores on verbal fluency, executive function and memory improved after training (Newberg et al., 2010). This was, again, attributed to the attentional effects of quiet meditation by the authors .

While surprising and highly promising, these results have not gone uncontested. Newberg has faced criticism for his approach and accused of following a religious agenda (Geertz, 2009). Yet others have argued against the whole field, claiming that it is impossible to empirically link physiological measures to the highly subjective measures of religiosity and religious experience (Newberg & Lee, 2005). While not without detractors, neurotheology is a rapidly growing field with exceptional promises to the understanding of our most sacred beliefs and practises, and with a sizable dose of scientific rigour, it may one day become a respected area of study in its own right.



Science moves in mysterious ways: the so called ‘god helmet’ used by St Pierre and Persinger (2006)

How much can we trust our memories?

Cassie Barton

Most people have experienced this at some point or another: you have a vivid memory of something exciting happening when you were younger, one of the defining moments of your childhood. Except that one day you bring it up with your family, and they deny that it ever happened! You get defensive: how could it not have happened when you remember it so clearly? But your family are probably right. False memories are common, and not at all difficult to form. Psychologists have been aware of this for years now - but how and why this happens remains a mystery.

False memories were first studied in the classic "lost at the mall" experiment by Loftus and Pickrell (1995). The experimenters gave out booklets detailing memorable incidents from the participants' childhoods, made in collaboration with relatives. Three of these were true stories, but one was a false description of the participant getting lost in a shopping mall at the age of 5, fleshed out with some real details to make it more convincing. Participants were then told that everything in the booklet was true, and were interviewed on what they recalled about the incidents and how clear their subsequent memories were. Remarkably, around a quarter of participants agreed that the shopping mall story had really happened to them, and were able to provide the interviewer with plenty of extra details about the event.

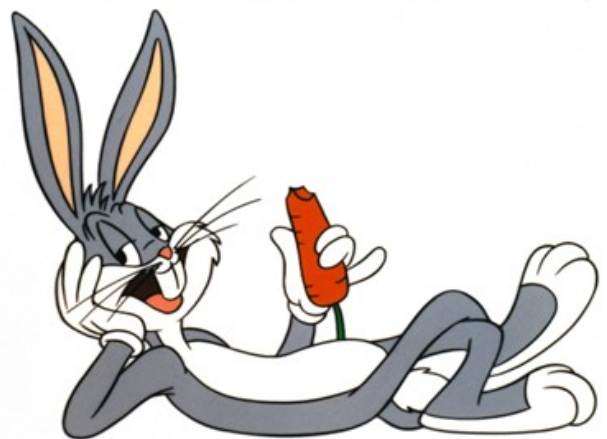
When they were debriefed, the participants were told that one of the stories had been false. Most correctly identified the shopping mall story as the false one - but still expressed real surprise, and reported feeling as if it really had happened. Of course, when a family member tells you about your past, you have no reason not to trust them. But it seems even adverts can also slip you a few false memories, without even telling you anything directly. In one study, participants who'd previously been to Disneyland were given some advertising material about the theme park to read. The writing was either a generic description of the theme park, or contained details of all the charac-

'It seems even adverts can slip you a few false memories, without even telling you anything directly.'



Lost or found?: some false memories may be more desirable than others...

ters you could meet, including Bugs Bunny. A total of 30% of the participants reading the "Bugs" text later recalled meeting the rabbit when they went to Disneyland - the rest perhaps realising that he's a Warner Brothers character and would not be found at a Disney attraction! The authors have suggested that what they call "nostalgia advertising" can work in the same way. An advert for Disneyland may be trying to create in you a feeling that you had an amazing time and want to go back, regardless of what you thought about the experience at the time.



Bugs Bunny: not to be trusted...particularly if he is found hanging around Disneyland

Sometimes, photographs from our childhood are seen so often that we think we actually remember them. Wade et al (2002) exploited this tendency, selecting photos of participants posing with a family member in childhood and cut-and-pasting the people into a picture of a hot air balloon. After being shown the photo a few times, approximately half of the participants were able to describe their memories of an entirely fictional balloon ride. Some have suggested that photographs are the best way of creating false memories because people are likely to trust them. However, a later study (Garry and Wade, 2005) found that a written narrative is better. This is perhaps because an image is concrete, whereas with a narrative your brain is free to invent whichever details make the most sense - or combine the false account with other, pre-existing memories. This might well make the false memory more convincing.

'Misleading questions can cause people to recall key details of an event incorrectly.'

Of course, false memories can also occur without being intentionally implanted by psychologists, and this is where real-world problems occur. Eyewitness testimony is based on the idea that people will remember what they see fairly accurately. Many studies have shown, however, that misleading questions can cause people to recall key details of an event incorrectly. There have also been several cases of patients suing their therapists who have, in trying to uncover repressed memories, unintentionally introduced false memories of abuse that didn't actually happen. There is still fierce debate about how often the forgetting and later recovery of traumatic memory happens, and what can be done to prevent false memories from being unintentionally created. After all, even memories that didn't actually happen can have emotional content potentially as damaging as that of real memories.

To deal with problems like these, it's important to know who is most likely to be susceptible to creating false memories. Unfortunately, there's no simple answer to either question. So far attentional

'Even memories that didn't actually happen can have emotional content potentially as damaging as that of real memories.'



A flight of fancy: Wade et al (2002) manipulated images of a childhood balloon ride to generate false memories

lapses, age, high scores on measures of dissociative experiences, introversion and mood have all been put forward as possible factors in susceptibility to false memories; however a failsafe predictive measure has yet to be found.

Likewise, it's not easy to tell true and false memories apart. False memories are believed to come about through interference, the process by which separate memories start to affect each other. When a false memory is created, it's combined with other information which is already known about that particular scenario. This 'mixing together' of memories may make true and false ones difficult to distinguish. Only with more research into how and why false memories occur can serious issues about the reliability of what we remember be resolved. As it stands the reliability of what you think you remember may not be as accurate as you might think.

Subliminal Messaging

Hannah Voss

Subliminal messaging has been the subject of much controversy over the last century, as it is perceived as a dangerous phenomenon that can lead to people's thoughts and actions being influenced without their knowledge and outside of their control. Claims have been made that subliminal messages can affect the decisions people make, explaining its subsequent use in advertising, its inclusion in the basis of several films and even its deployment as a tactic used by police in America to encourage suspects to hand themselves in. However the term 'subliminal messaging' implies something that is much more controversial and aversive than the reality.

Subliminal messages are a type of subliminal stimuli; stimuli which are presented below the conscious perception threshold. This means that although individuals are not aware that they have been exposed to the stimulus, it has been perceived by their unconscious at an implicit level which may subsequently have an effect on them. Subliminal messages can be any sort of stimuli, but are famously either images which are flashed across a screen, too quickly for conscious human perception, or messages hidden within audio stimuli. In terms of the latter, the audio may sound normal when played forward but might contain a different message when played back.

Advertising has taken advantage of this phenomenon and for a while, and many companies sought to use subliminal messaging to create a familiarity with a brand or a product, which allegedly translated into preference. Research by James Vicary (Vicary, 1957) claimed that through showing audiences at the cinema flickers of text reading 'drink Coca-Cola' and 'eat popcorn', sales of each increased by 18% and 58% respectively. However, Vicary later admitted to fabricating the results of this study and there are doubts as to whether the study ever took place at all. Nevertheless, the study did have the effect of starting off speculation about subliminal messaging and its potential dangers. A book by Vance Packard entitled 'The Hidden Persuaders' contained details of the study by Vicary and led to growing fears among the public that subliminal messages could be used to



Red, white and blue, the colours of the American flag, frequently make an appearance in American presidential campaigns.

'brainwash' the population, and this controversy grew so great that the use of subliminal messaging in advertising was banned across the UK, Australia, the US and Canada in the 60's and 70's.

However, public impressions of the power of subliminal messaging and psychological fact are liable to be discrepant. Is it really possible to influence a person's thoughts and opinions without them being aware of it? How can such a process occur? If subliminal messaging is as influential as pop culture leads us to believe then the implications are serious. It is important to know if subliminal messaging can have an effect on individuals, and if it does then how strong this effect is.



You really have ask yourself: did you actually want three whole buckets of popcorn before you went into the cinema?

It has been suggested that subliminal messaging occurs because of the nature of perceptual thresholds which allow us to recognise when, and when not, a stimulus has occurred. These processes are sometimes referred to broadly as 'detectors'. Unconscious perception of a stimulus is said to have occurred when there is not enough information for the stimulus to cross the threshold into conscious awareness, but it still registers on the continuum of the said detector. Thresholds aside, information about the occurrence of a given stimulus is also thought to be collected in the detector on a continuous basis.

The above information provides a model of why subliminal perception occurs, however evidence to support the influence of subliminal stimuli on people has produced mixed results. For example, Marcel (1983) presented participants with words for a set duration of time, then reduced the length of time until the participants could not say whether they had seen the word or not. Interestingly, the study concluded that even when participants had reported seeing no word in the trial, they could make a reasonable guess at the meaning of the word. This supports the idea of subliminal messaging, and shows that people's decisions (what they 'guessed' for the meaning of the word) are influenced by what they perceive implicitly. Further-

'Subliminal messages can be any sort of stimuli, but are famously either images which are flashed across a screen too quickly for human perception or messages hidden within audio stimuli.'

more, Hirshman and Durante (1992) found that participants could distinguish the meaning of a stimulus without being to exactly identify what the stimulus was.

Despite these examples, any conclusions about subliminal stimuli, or unconscious perception must be made very carefully. Other experiments have shown little compelling evidence that subliminal messaging has any effect on people. For example, Vokey and Read (1985) concluded that their participants were in no way influenced by the semantic content of hidden backward messages in audio stimuli. There is no concrete evidence for the powers of subliminal messaging to be so effective that it could influence people to do something without their knowledge; even the experiments which have found some effect were undertaken in a laboratory with participants actively looking for the subliminal

stimulus. A subliminal message in real life, for example embedded in an advertisement is much less likely to have an effect on minds which are not focussing on it. However, the evidence does provide some explanation as to how subliminal stimuli might work, and as such it may be worth further investigation of the conditions under which stimuli can be

perceived unconsciously.

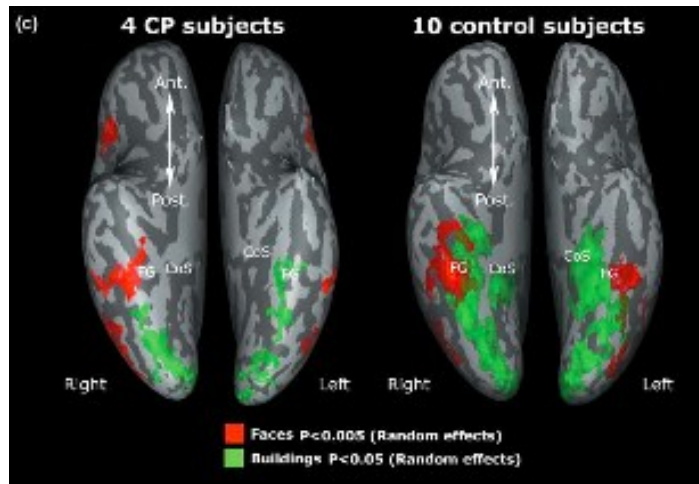
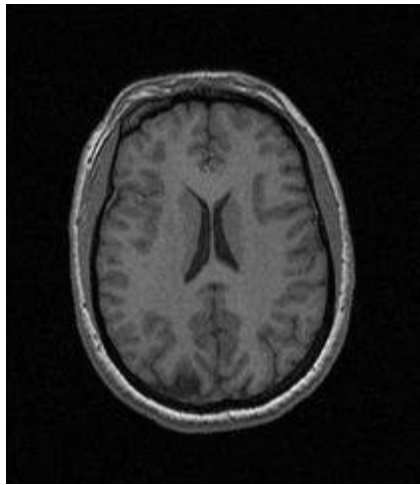


Elvish: often used subliminally to make you buy mordors!

Note: Complaints about that joke can be filed to the editor at psychout@ysu.org.

Thinking ahead: onwards in neuroimaging

Grace Rice



Neuroimaging techniques continue to become more accurate and sensitive since their inception.

Since the invention of neuroimaging the area of cognitive neuroscience has exploded with a wealth of research examining the relationship between brain activation and behaviour. Even now, the area is expanding with new techniques being developed to advance our knowledge of the relationship between the mind and brain. However with advancement comes with it questions and issues which have to be resolved....

One such area is how neuroimaging data is analysed. Traditional imaging analysis used in fMRI experiments examines the activity of a specified brain region in response to an experimental task. Over the past ten years, there has been a migration away from this approach towards procedures which take into account the pattern of activation during experimental tasks as opposed to a region of interest (ROI) approach. This new 'multivariate' approach to imaging analysis is considered more sensitive and has been argued to provide more accurate results (Haynes & Rees, 2006).

The multivariate approach was first seen in the context of object perception. Haxby and colleagues (2001) examined patterns of activation across the ventral stream in response to different object categories. Haxby used a 'multivariate' technique called 'pattern classification' which attempts to find similar or dissimilar patterns of activation during stimuli presentation. Results showed similar patterns of activation between different exemplars of the same category (for example,

between two separate facial stimuli) and different patterns of activation between different exemplars of different categories (for example between a face and a house). This result suggested that pattern classification could be used to decode patterns of activation in the ventral stream into different object categories.

There has been debate whether this approach can be generalised to real world applications. Some researchers have suggested that pattern classification cannot be used in other situations because the results are gained because of training to controlled experimental stimuli which do not carry the variable properties of real world stimuli. Despite this limitation, other schools of thought have suggested that pattern classification can be applied to larger areas including detecting preferences for products, deception and even consciousness. The following section outlines these areas both in terms of potential advancement and ethical issues.

Detecting consciousness

One proposed area in which pattern classification has been suggested to be of benefit is in the clinical diagnosis of patients in a persistent vegetative state (PVS). Indeed, in the last issue of PsychOut this very issue was addressed. A study by Owen et al (2006) showed that fMRI techniques could be used to detect conscious awareness through the use of mental imagery tasks. This detection of

covert consciousness in patients with a PVS suggested that fMRI techniques could be used to provide a potential system of communication for patients. However, this area is obviously fraught with ethical dilemmas, not least because if consciousness can be detected the law remains ethically ambiguous regarding the continuation of life support.

Neuromarketing

Another area in which pattern classification could be useful might be the decoding of personal preferences in a marketing and advertising context; this was also addressed in the previous issue. This application of neuroimaging techniques to marketing strategies is advantageous as it potentially eliminates the impact of socially desirable answers usually associated with questionnaires. However, because of the complexity of a given 'purchasing' behavior, it is hard to determine whether pattern classification techniques can actually be applied to this field in a practical sense. Moreover, one ethical issue is that preferences held by participants may be not be consciously even by them; this decoding of unconscious preferences in order to increase profit subsequently highlights a potentially nefarious use of technology.

Lie detection

Pattern classification has also been applied to the domain of lie detection. The idea of being able to tell whether someone is lying is of great social importance, not only in everyday life, but in forensic and legal contexts as well. Previously, lie detection has used fallible techniques such as polygraphs to examine changes in the skin conductance to detect deception; these techniques are indirect measures of cognitive activity and have shown variable results in the literature (Haynes & Rees, 2006). More recent research has examined the use of pattern classification to decode deception in participants. For example, Kozel et al (2005) examined the role of pattern classification in detecting concealed conscious thoughts. Participants engaged in a mock crime scenario; they were instructed to lie about stealing either a watch or a ring. During scanning they were questioned on both items (so the ring group lied about stealing the ring and told the truth about not stealing the watch and vice versa). The authors were able to discriminate between truth statements and deception statements with a great deal of accuracy. Although this work provides

the baseline for applying pattern classification to deception, future research needs to examine the robustness of these results for it to be used responsibly in wider contexts (Kozel et al, 2005).

Ethical implications of decoding mental states

The advancement of this area has been outlined in three potential contexts, although each has its own ethical costs associated with it. In order for this area to continue to develop the ethical costs and benefits have to be weighed against each other. Such benefits are obviously highlighted within the clinical context of detecting consciousness in patients who are otherwise unable to communicate with the outside world. However the ultimate ethical limitations associated with this approach include the issue of consent; in order for scanning to take place consent must be obtained from patients, this may be hard to gain in a forensic context because of the potential consequences of deceiving the police. What's more, consent is also an issue when potentially sensitive and personal preferences may be decoded (Haynes & Rees, 2006).

As seen, pattern classification is one example of a new multivariate approach to neuroimaging. It is more sensitive than a traditional ROI analysis and takes into account the patterns of brain activation. Currently, pattern classification has been shown to be effective in the field of object classification; however the potential for it to be explored in real life contexts have been elaborated here.



Can the editor think of a good caption for this image? yes.

God Genes: can psychology explain religion?

Hannah Belcher

Religion is not a topic often explored by the behavioural sciences; instead it is often left to theologians and philosophers to argue over its existence. However, at the heart of every religion is a collection of complex behaviours and belief systems, which are two subjects that psychology deals with frequently. So how come many psychologists avoid the enigma of religion like the plague? The answer must lie in the enormity of the issue. It is a highly emotive and subjective topic, and almost every human holds some religious beliefs, even if those are atheist. Humans are so certain of their beliefs that wars have been started and many would be prepared to die in the name of their faith. The destructive repercussions of claiming to find that religion is 'all in the mind' is a definite threat to psychologists, however, a brave few have approached the topic to learn more about one of the most ancient and universal human behaviours still in existence. It is outside the realm of psychology to determine if a God really does exist, but it can at least attempt to map out the psychological profiles of those who are extremely religious and identify the possible neurological mechanisms involved.

Religion has the capacity to offer a believer everything they are missing, or at least offer a more predictable, stable alternative. Where relationships with love ones can be tenuous, the relationship with God is secure and deep. What is difficult to determine is cause and effect; are people attracted to religion because they feel their lives are empty, or is the secure relationship with God and consequently deeper feelings of meaning and worthiness a result of having that faith? Psychologist Anthony Storr approached the subject in his exploration of solitude as a necessary human condition. In it he describes the emphasis made by religious leaders on solitude, meditation and

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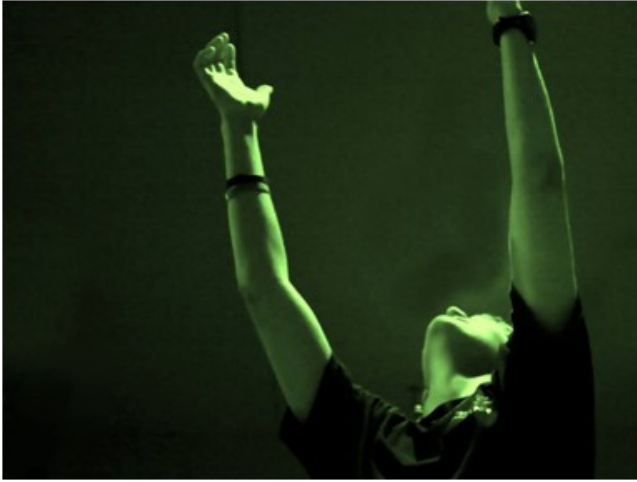


prayer to promote religious insight and to feel at one with the universe. Freud was not a believer; he felt that a God couldn't exist as he himself had no such feelings. Instead he describes how feelings of unity with the universe were actually just feelings of wholeness and a part of the external

world. Freud compared the need to have such feelings as originating from the infants sense of helplessness. His belief was that there was something abnormal and neurotic about putting God before other people, instead suggesting it was used by those seeking a secure haven, who had failed at

their relationships and who disliked taking responsibility. This theory seems unlikely though when considering the sheer number of people in the world with strong religious beliefs; they can not all be





Interesting theories have arisen from evolutionary psychologists. Richard Dawkins for instance coined the idea of 'God Memes', which unlike genes refer to units of transmission and selection in the cultural domain. Like genes, memes also act selfishly and behave as though their only goal is to make multiple copies of themselves. The God meme's survival power relies on its great psychological appeal, for example the answers it provides for questions such as the meaning of life and the comfort it provides for the injustices in life. It is believed that over time religious beliefs have evolved to form stronger faiths, beginning with a combination of ancestor worship and nature spirit worship and developing into the monotheism we know today. It is thought that the religious instinct is so powerful because it increases group cohesion and thus is beneficial for survival (Stamos, 2008). Humans naturally form into hierarchical groups and will naturally conform, as was demonstrated by Milgram's infamous shock experiments. Geoffrey Miller (2001) explains how because of this, religion would have become more and more attractive, however, no other animals have religion and so it seems unlikely that group cohesion is the only reason for its existence.

What is evident from such research is that humans appear to have a unique 'religion instinct'. Small children below the age of 5 will naturally reason about the world in theological terms, believing that God's power explains much of the world. This is regardless of cultural background, suggesting an intuitive theism. Research using neuroimaging has found that this religion instinct may even originate

'What is evident from such research is that humans appear to have a unique 'religion instinct.'

in specific brain regions. Brain scans of Tibetan Meditators and Franciscan Nuns during prayer sessions revealed greatly reduced brain activity in the posterior superior parietal lobe, which is an area important in orienting a person in physical space. Such findings were combined with reports of feelings of infinity during such sessions, as well as sense of timelessness and unity with the universe (Stamos, 2008). In addition to this, exciting findings have been made in the field of genetics. In particular a gene which is thought to increase dopamine and serotonin, and consequently makes us happier, take more risks and seek union with others, has been coined the 'God Gene'. This, in combination with the A33050c allele, is thought to be enough to predispose us towards spirituality (Hammer, 2004).

Typical of the sciences, what was once an ancient mystery has been reduced to neurons and genes. However, Hammer (2004) was keen to point out that both science and religion needn't be enemies, in fact, if God did exist then what greater tool to make us recognise his presence than wiring our brains to seek out religion. Clearly a conclusion cannot be made as to whether Psychology disproves religion; one is an objective measure of behaviour and the latter a highly subjective and personal experience. Research looking at religion does however remind us of the extraordinary power of the human mind in helping us to perceive ideas above and beyond what we know and see.



Religion is a pan-cultural human behaviour



Pop Psychology refers to the culturally relevant aspects of and give people scientific insight into aspects of popular culture

Was Norman Bates really 'Psycho'?

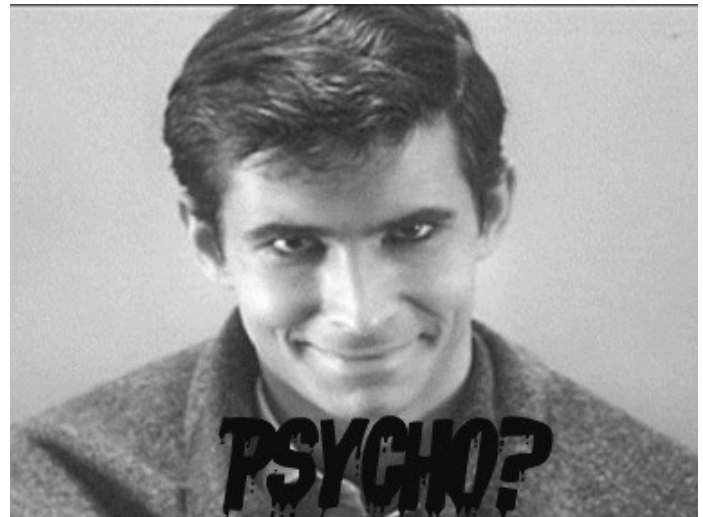
Marianne Cezza

Everyone knows the shower scene, but who really killed the pretty but troubled girl? Norman Bates, the seemingly nice, normal guy that shocked audiences in Hitchcock's 1960 adaptation of the novel *Psycho* by Robert Bloch, is poles apart from the average Hollywood murderer...there aren't many who can blame it on their mother! Here we take a look at **Dissociative Identity Disorder**, the suggested diagnosis for the traumatised killer.

Bloch describes three dimensions to the character of Bates: 'Norman' and 'Norma', the co-dependent child and mother, and 'Normal', the adult seeking to appear ordinary, with (an admittedly unusual) penchant for stuffing birds. The key to understanding Norman Bates' condition lies in the psychiatrist's explanation at the end of the film where it is revealed that Norman's clingy and possessive mother raised her son alone. In the bereavement of the loss of the boy's father the two developed an unhealthy, co-dependent relationship. The turning point arrives when Bates' mother takes a lover; his wild jealousy causes him to poison them both. However, suffering from the guilt of matricide, Norman steals his mother's corpse and preserves it, denying to himself her death.

What is DID?

The resulting behaviour is suggestive of the symptoms of Dissociative Identity Disorder (DID) (formerly Multiple Personality Disorder); unsatisfied by his mother's mere physical presence, Norman gives her half of his mind, speaking for her, acting as her and even wearing her clothes and a wig – one of the film's more alarming moments. DID is



Norman Bates: making most peoples mother issues look trivial since 1960

defined by the Diagnostic and Statistical Manual for Mental Disorders (DSM-VI-TR) as at least two additional identities and the presence of significant amnesia, denying them of any recollection of their alters' actions (American Psychiatric Association, 2006).

The primary identity, - 'Normal' Bates in this instance - the physical person with a given name is dependent on the other personalities and demonstrates passive, guilty and depressed behaviour. As seen with Bates' alter, 'Norma' the mother, the identities can be different ages and genders with their own idiosyncrasies, vocabulary, even general knowledge and even physiological differences like pain tolerance and asthma levels (Birnbaum & Thomann, 1996). Passive identities have more limited memory than aggressive and powerful identities.

The individual can also lose general biographical memory (see the DSM criterion on the right).

The Symptoms

Around 1 in 100 people suffer from DID, experiencing extreme levels of the common dissociation felt by all, such as daydreaming during a lecture and having no clue what's going on afterwards due to loss of awareness (Haddock, 2001). The level of dissociation is so great in DID sufferers that they struggle to unite identity and memory and consciousness (American Psychiatric Association, 2006). The symptom of amnesia is especially central to the story's plot generating an element of mystery to the murder.

Symptoms of DID can seem applicable to other illnesses such as schizophrenia, personality disorders, post traumatic stress disorder, epilepsy and even eating disorders (Gleaves, May & Cardeña, 2001). As a result, symptoms can be difficult to detect such as depression or headaches, the latter being thought to be caused by the switching of personalities (Haddock, 2001). Additional symptoms include panic attacks, diverse sleep disorders, frequent mood swings, alcohol/drug addiction, suicidal tendencies and phobias (Dissociative Identity Disorder: A General Discussion, 2011), all common posttraumatic symptoms. The symptom of lack of intimacy and personal connections is demonstrated in the film by references of Bates as a hermit. Furthermore, when asked by victim, Marion whether he goes out with friends he replies: "a boy's best friend is his mother".

Causes and Treatments

The main trigger for DID is trauma suffered typically in childhood, such as overwhelming stress such as a serious medical illness, loss at a young age and insufficient childhood nurturing and/or abuse, either physical, sexual or emotional. Norman experienced the latter two, with the death of his father and the emotional abuse from his possessive mother. Some cases of DID are caused by the inherent ability of the individual to dissociate memories from their consciousness. However, research has shown that in the majority of cases the cause does tend to be prolonged child abuse (Kluft, 2003).

The main treatments of DID are drugs purely to manage the symptoms of associated with other disorders for which it can initially be mistaken, including eating disorders and epilepsy. However, it

Diagnostic Criteria of DID (DSM-VI TR)

The existence of two or more alternative personalities each with their own patterns of relations

At least 2 identities regularly control the individual's behaviour, manifesting involuntarily and spontaneously

the presence of amnesia of important personal information beyond common absent-mindedness, not due to effects of substance or general medical conditions

(The American Psychiatric Association, 2006)

cannot alleviate dissociation. To cure DID psychotherapy is used to integrate the identities (Simeon, 2008)). Hypnosis can also be helpful in identifying the identities; nevertheless, there is no quick-fix cure.

So was Bates really 'psycho'? Well, yes. Based on the nature of Dissociative Identity Disorder, it would be fair to suggest that the condition is severe enough a mental illness to classify as psychosis. As for the legacy, I will admit to seeing neither the sequels where Norman is supposedly cured, nor the re-make. But let's be honest, Hollywood's been squeezing *Psycho's* success dry. Anthony Perkins' perfect portrayal of a sufferer of Dissociative Identity Disorder should prevail, and its ruins in *Psycho II, III and IV* forgotten.



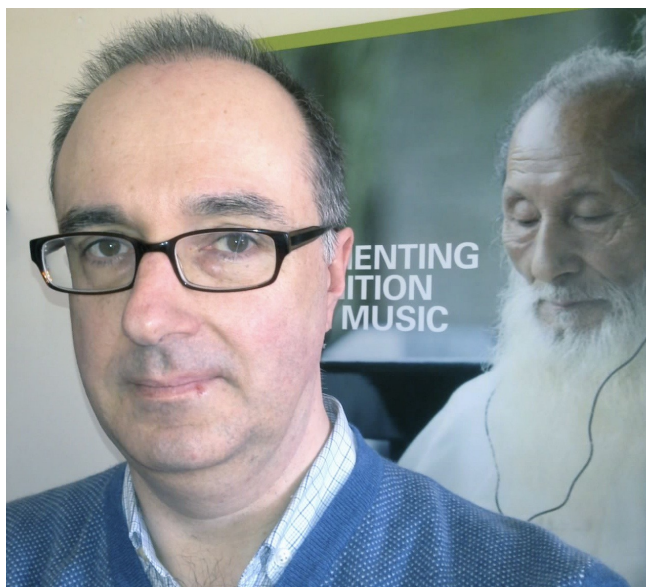
The Official Norman Bates shampoo range: only useful if you plan to wig out

Meet the Staff

Welcome to the Staff Section where members of the Psychology Department are able to write about their previous, current and upcoming research projects within the department

Studying the musical mind

Marcel Zentner



Music is Primordial

Homo sapiens is musical; so much is clear. A recent excavation in southern Germany found a flute dated to be at least 35'000 years old, suggesting that musical engagement is much older than has been previously suspected. Ontogeny repeats phylogeny it is sometimes said. Indeed, my colleagues and I found infants to exhibit amazing musical behaviours. My first study in this area demonstrated that 32-week old infants behave like tiny music critics. They frown and even cry when musical melodies played in dissonant intervals, but show interest when the same melodies are played with consonant intervals (Zentner & Kagan, 1996).

More recently, we found that infants are much more physically responsive to the rhythm and tempo of music than speech and find it more engaging (Zentner & Eerola, 2010). We observed 120 babies aged 5 months to 2 years as the babies were perched on one of their parents' laps. The parents wore headphones to block out the sound of the music and were asked to stay still so as not to influence the results. We played recordings of various genres of music, including classical and rhythmic beats, or speech sounds, and watched as the babies moved their heads, arms, legs, and bodies in time. 3-Dimensional motion capture cameras and professional ballet dancers were used to evaluate the movements and determine how well-coordinated they were with the music. Most babies responded more to the music than to the speech recordings regardless of age, suggesting that humans may be born with a predisposition to move rhythmically in response to music [Figure 1]. In addition, the babies also smiled more in response to the musical recordings. The latter finding suggests that humans are emotionally rewarded by music from a very early age.

Music-Evoked Emotion

Emotions experienced in response to music seem to be at the very heart of music's universal appeal. But what makes these emotions so appealing? An important part of my work has been devoted to this question. In the absence of an empirically based taxonomy of music-evoked emotions my col-



Humans respond to music from a very early age

characterise music-evoked emotions through an inductive, empirical approach about a decade ago. We started with 515 affect terms that could be progressively reduced to 45 emotion terms referring to emotive states typically and recurrently induced by music.

The second aim was to examine the structure underlying ratings of musical affect. To this end, we used a series of statistical data reduction techniques that make it possible to group the emotion terms into super-ordinate categories of relatively homogeneous items. The procedures ensure that terms in a given category are similar to each other, while they are also dissimilar to terms in other clusters. The application of such techniques revealed that a model with nine emotion clusters best fitted the data (Zentner, Grandjean & Sherer, 2008). The first component to emerge from this analysis we chose to call wonder, after the French term "émerveillé," which is typically translated as "amazed", but is more accurately translated as "filled with wonder". Tenderness, nostalgia, transcendence and tension are further musical emotion families [Figure 2 overleaf]. This model has been polarizing the field since its inception.

The reason is that it sits uncomfortably with prevalent theories of emotion, especially the so-called 'basic emotions' theory. Basic emotion theory posits that all emotions can be derived from a limited set of universal and innate basic emotions, which

typically include fear, anger, disgust, sadness, and happiness. Each basic emotion category may be explained functionally in terms of goal-relevant events that have been shaped by evolution. Disgust, for example, is seen as an adaptation that warns humans to stay away from places where germs and other pathogens may be lurking. The difference between the two models led us to posit two classes of emotions, utilitarian emotions and aesthetic emotions (Sherer & Zentner, 2008).

Individual Differences In Musicality

While the general ability to process and enjoy music is extremely pervasive, probably universal, there are also large individual differences in musical ability, including in the extent to which music appeals to humans. However, the study of individual differences in musicality has been rather fragmentary, with bits and pieces originating in various traditions of research, most notably music education and music cognition. As important as these efforts have been, they have failed to materialize in a comprehensive and standardized measure of musical capacity. For various reasons, the development of such a measure is anything but easy. However, in a period when researchers are increasingly interested in relating musical capacities to non-musical traits, ranging from empathy to dyslexia, such a measure becomes indispensable.

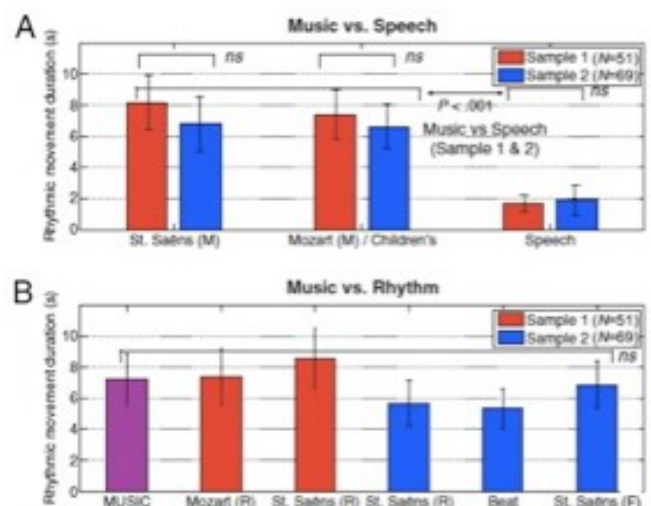


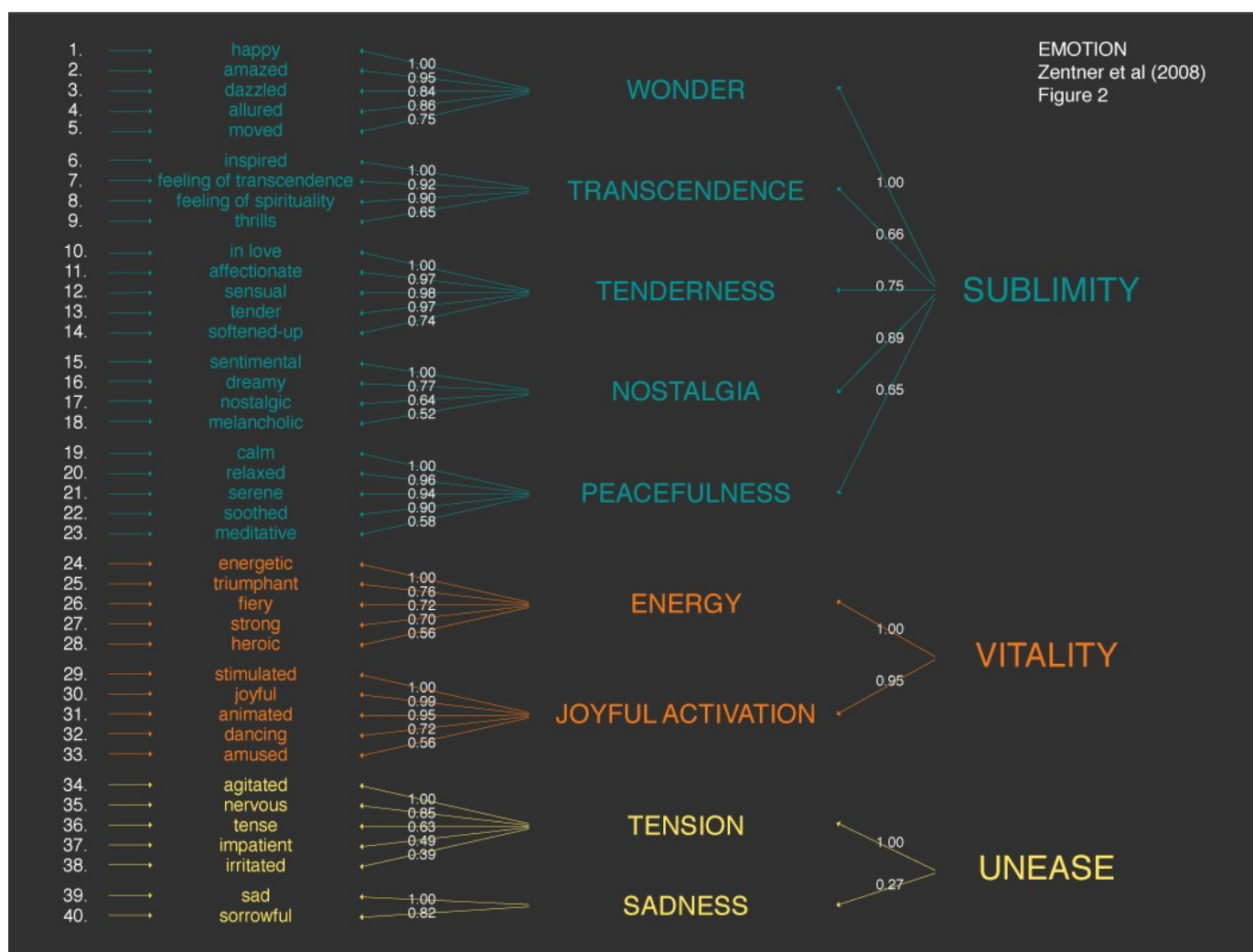
Fig. 1. Duration of rhythmic movement during all musical stimuli vs. control stimuli across both experiments. (A) Music was much more effective in generating rhythmic movements than was speech (Audio S1, S3, S7, and S10). (B) Rhythm was just as effective as music, and again more effective than speech, in eliciting rhythmic movement (Audio S2, S4, S8, S9, and S10). The MUSIC condition refers to the mean of Saint-Saëns, Mozart, and children's music versions. Letters after the stimulus name refer to rhythm (R) and fluctuating (F) variants of the musical stimuli. The Beat label denotes the average of beat 1 and 2 conditions. Error bars indicate SEs.

My collaborators and I have been working on developing just such a measure. A distinctive aspect of the measure is that it not only captures aspects of music processing such as melodic or tempo discrimination, but also emotive-motivational components of musicality. To account for individual differences in both components I have coined the term 'music-mindedness'. How do we measure music-mindedness? There are three components, one is an objective test of musical ability, which is currently being developed by Lily Law, a PhD student at our department. The second component is a questionnaire measure. Finally, in an ongoing collaboration with Liat Levita, we have also started to look into physiological arousal patterns in with high and low scores on the music-mindedness scale

'To account for individual differences in both components I have coined the term music-mindedness.'

I should note that in this work I was greatly helped by untiring research assistants, above all Samantha Das, Tomas Folke and Elaine Tham. My hope is that, once the measures of music-mindedness are fully validated, it should be possible to relate individual differences in musicality to extra-musical traits, such as linguistic ability, cognitive functioning and personality more effectively than is currently the case. By understanding such relationships, it should be possible to get a fuller picture of music's evolutionary origins

To find out more about Marcel's previous and on-going work please refer to his lab website: www.zenterlab.com



Insights from developmental psychology

Lisa Henderson



Studying child development is not only highly rewarding and challenging, it's also crucial to our understanding of how we come to be the way we are. Developmental child psychology is concerned not only with describing the characteristics of

psychological change over time, but also seeks to explain the principles and internal workings underlying these changes. The more researchers can learn about development, the more we will be able to help children with various pervasive impairments such as autism and learning difficulties such as dyslexia, and we will also be able to develop models for how to stimulate children's development in general. These are just some of the reasons why I have such a strong interest in developmental psychology and why I have spent my career to date studying typical and atypical development.

In this article I would like to tell you a bit about some of my past and present research projects

and then share some of my experiences and tips for running experiments with children.

In 2005 I graduated from the University of Hull with a BSc Hons in Psychology. During my degree I became fascinated with the process of reading and how and why some children acquire written language so effortlessly yet other children with dyslexia find learning to read so difficult. My final year empirical project examined the association between dyslexia and visual stress (the phenomenon of visual discomfort during reading that is treated by placing coloured plastic sheets over text). These experiments supported the controversial view that coloured overlays can lead to immediate improvements in the reading skills of children with dyslexia; however, subsequent experiments ran here at York have shown that any improvements in reading with coloured overlays by dyslexic readers may be highly unreliable.

'The more researchers can learn about development the more we will be able to help children with various pervasive impairments...'

During my MSc in Reading, Language and Cognition here at York I ran further experiments to examine the neuropsychological characteristics of dyslexia with Andy Ellis (2005-2006). The results of these experiments suggested that individuals with dyslexia show reduced cooperation between the left and right hemispheres of the brain during written word recognition.



Lisa and her colleagues preparing children for testing

Understanding how children access the meaning of language

To expand my interest in reading and language development, I was delighted to start my PhD with Maggie Snowling and Paula Clarke here at York (2006-2009). My PhD looked at how children access the meanings of words and use this information for the purpose of comprehension. We also investigated how the ability to access the meanings of words and use surrounding context to drive this process may breakdown in children with comprehension impairments. We focused on two interesting groups of children: poor comprehenders (children who show intact word reading skills but have difficulties understanding text/discourse), and children with autism spectrum disorder (ASD) (who often show a 'poor comprehender' reading profile but who have an array of additional cognitive and social difficulties).

Poor comprehenders had difficulties with accessing word meanings very early in the time course of processing, whereas children with ASD had difficulties maintaining activation of word meanings for further processing later in the time course. These results highlight that comprehension impairment is multifaceted and may stem from different underlying causes and subsequently require different kinds of intervention. I thoroughly enjoyed the whole PhD experience and found it a complete privilege to be granted three years to fully immerse myself in the research. So, if you've got that same drive then go for it!

New word learning in children and the role of sleep

Very recently I've been fortunate to join the Sleep, Language and Memory (SLAM) lab as a postdoctoral research fellow with Gareth Gaskell (University of York) and Anna Weighall (Sheffield Hallam University). In an exciting series of school-based experiments we are investigating how children learn new words. Gareth's previous line of research with adults has shown that individuals learn the phonological (sound) form of a new word very quickly, but it takes a period of off-line con-

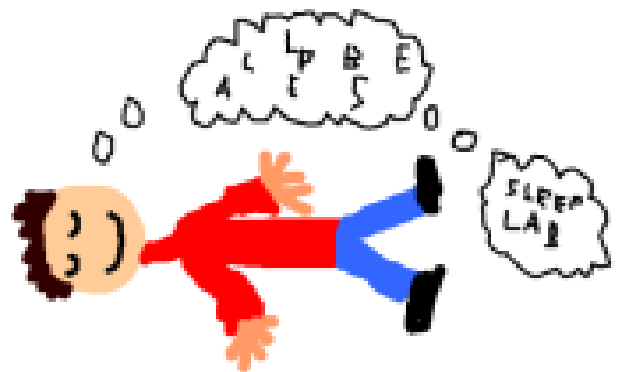
solidation before this new word is fully integrated into the brain's lexicon. For instance, when learning a new word like 'cathedruke', participants do not show interference when recognising the similar sounding familiar word 'cathedral' immediately, but interference emerges after a period of sleep-based consolidation.

We are now investigating whether the same findings are observed in children, and indeed, whether sleep is important for the lexical integration of new words. Such findings would have important educational implications. We will be running polysomnography experiments

in the new sleep lab, behavioural experiments that will track the time course of word learning, and free-viewing eye tracking experiments. Watch this space for our results!

Tips for running experiments in schools

Running school-based experiments can be very enjoyable and rewarding. There are a few things to be aware of that can ease the whole process and help ensure the success of your experiment.



This image, created by 9 year old Stan Gaskell, actually sums up a considerable amount of the sleep and language literature!

Working with schools

Communicating effectively with schools and parents is paramount to the success of a school-based research project. When approaching a school I usually take the following steps: (i) ring the schools ahead of time; (ii) send them the relevant information and give them at 1-2 weeks to read over it; and (iii) recontact the school after this time to see if they are still interested and hope they say yes!

Methodology and task design

Infants and children cannot always be tested in the same ways as adults. It is important to keep the length of the experiment to a minimum and to use innovative methodologies that minimise task demands. On-line methodologies such as free-viewing eye tracking and EEG/ERP are increasingly being used in developmental research since they have the potential to measure the process under investigation as it unfolds in real time and without introducing unnecessary task demands. Unfortunately, such methodologies can be expensive, time consuming, and require training and many studies subsequently use more basic methodologies such as questioning.

Good ethics

In short don't do anything like the experiments seen below! However more detailed advice would include the following (although this is by no means

exhaustive!): get a recent Criminal Records Bureau (CRB) check before you can run experiments with children and work in schools.

You must ask the Head Teacher to sign an informed consent form prior to running an experiment in his/her school.

You must also provide clear information about the study (prior to obtaining consent) to teachers, parents and children.

During one-to-one experimental sessions with children it is possible that they may disclose information to you that raises child protection issues. You must find out who the Child Protection Officer is at every school you work in and make sure you are aware of the child protection procedures.

Humour, wetwipes and shiny stickers!

Lastly: I advise wet wipes for damage protections when a child sneezes on your laptop, stickers or a small certificate as rewards to keep them motivated and a good sense of humour to keep them happy and relaxed!

Lisa is a great source of advice if you are planning to run studies with children and is happy to answer any questions. To contact Lisa her email is: L.Henderson@psych.york.ac.uk

The Monster Study (1939)

This highly unethical study was conducted on 22 orphan children in Davenport, Iowa, in 1939 by Wendell Johnson and Mary Tudor (University of Iowa). After placing the children in control and experimental groups, they gave positive speech therapy to half of the children, praising the fluency of their speech, and negative speech therapy to the other half, belittling the children for every speech imperfection and telling them they were stutterers. Many of the normal speaking orphan children who received negative therapy in the experiment suffered negative psychological effects and some retained speech problems during the course of their life. This experiment was dubbed "The Monster Study" by some of Johnson's peers who were horrified that he would experiment on orphan children to prove a theory. The University of Iowa publicly apologized for the Monster Study in 2001.

The Ape and the Child (1931)

The psychologist Winthrop Kellogg wondered whether if an animal were raised by humans — as a human — would it eventually act like a human? In 1931 Kellogg brought a seven-month-old female chimpanzee named Gua into his home and raised her alongside his 10 month old son Donald as if she were human. Donald and Gua did everything together and the Kelloggs subjected them both to regular tests to document the progress of their development. Gua often performed better than Donald, but in terms of language acquisition she was a disappointment. Unsurprisingly, Gua did not learn to speak. Disturbingly, Donald's language development suffered. When he one day indicated he was hungry by imitating Gua's "food bark" the Kelloggs decided to stop the experiment. On March 28th, 1932 they shipped Gua back to the primate center.





Would you like to know more about our staff in Psychology Department than their e-mail address and psychology field? If yes, then become a regular reader of our interview section! In each issue, we will interview a guest who will tell us about their attitude towards psychology, current research and provide students with success tips.

Rebecca Milner: a Forensic Psychologist

Francia Clayton interviews Rebecca Milner, a Chartered Forensic Psychologist who currently lectures at the University of York



What is Psychology for you?

During my career Psychology has really been about applying what we have learnt through well designed research to trying to help people change their behaviour. I have mainly worked in the area of treatment of men who commit sexual offences. Facilitating change in thinking and behaviour in this type of client has obvious benefits both for the client himself and the safety and protection of the public. Applied psychology in this field does make a difference.

Why and when did you choose Psychology as your field of expertise?

I took a Psychology A level because I thought it looked more interesting than Geography! I had a fabulous teacher, really enjoyed the lessons and this resulted in me applying to do Psychology at undergraduate level, but without knowing what I would want to do with the degree. In my third year at University we had the opportunity to undertake a placement and I did mine at Wakefield Prison, a male maximum security prison. I couldn't believe that anyone would pay me for doing such an interesting job! Whilst challenging on lots of levels I knew becoming a forensic psychologist was what I wanted to do.

Tell us about your research area...

I am working towards a PhD in the area of desistance in men who sexually abuse children. I would like to understand the psychological process underlying desistance; why do some men stop offending and others continue? The research will aim to explore the internal and external processes, individual factors and correlates associated with desistance in men who sexually abuse children. It also aims to investigate if desistance can be measured, via the construction and validation of a scale.

How did you develop your career in Psychology?

During the final year of my degree I worked as a volunteer in the Psychology Department at HMP Wandsworth. I did the filing and photocopying but also starting to be involved in the initial assessments carried out with sexual offenders. Upon completion of my degree I became a Psychological Assistant at Wandsworth and later moved to Wakefield Prison as a Trainee Forensic Psychologist. I became involved in the risk assessment and delivery of treatment programmes for sexual offenders and violent offenders. I completed a Masters in Forensic Psychology (whilst working at Wakefield) and progressed to becoming a Senior Psychologist, and Head of Sex Offender programmes over the next 5 years. I then moved to the Offending Behaviour Programmes Unit at Prison Service Headquarters where I was a National Clinical Lead for two Sex Offender Programmes, advising on complex, high risk cases and developing a treatment programme for sexual offenders. I was also involved in research and the training, selection and supervision off staff.

I've always wondered do you enjoy watching programmes such as CSI or Cracker?

I can honestly say I have never watched an episode of either. Working in a prison is an emotionally demanding and draining job at times. I was assessing and delivering treatment to sexual and violent offenders and dealing with high risk complex cases; the last thing I wanted to do at night was come home and watch more of it. I occasionally watch Crime watch to see I can recognise anyone!

Can you tell us one book that you think all psychologists should read?

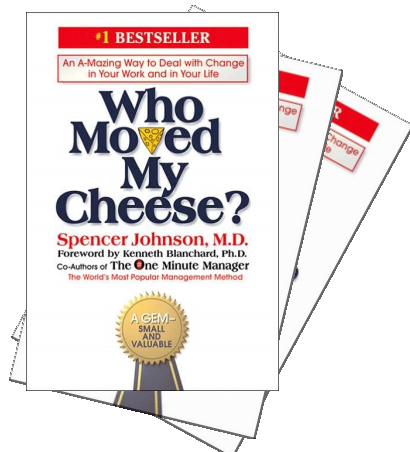
There are several good reads on sexual offenders (!) but 'Who Moved My Cheese, by Spencer Johnson, about the process and acceptance of change is an easy and very light read when you need a break.

The theme of this issue is the mysteries in psychology, what would you say is the main unresolved issue in your field of research?

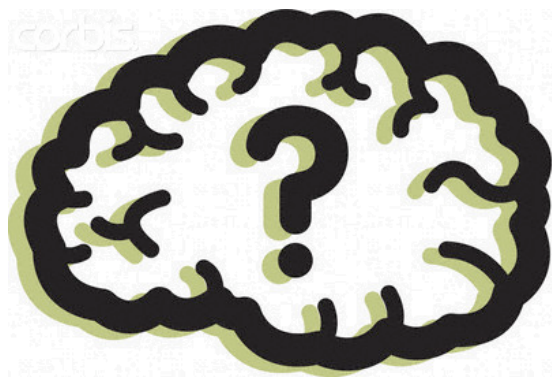
Desistance in sexual offenders is completely unresolved. We have some idea about why violent men desist from crime (a good marriage, employment and the creation of a non offending identity), and we know an increasing amount about the factors that are linked with recidivism in sexual offenders (sexual interest in children, pro offending attitudes, poor emotional intimacy). We also know that some men do change during treatment. What we don't know is *how* sex offenders change, and that is the question I would like to try and start to answer.

Finally, what advice would you give to aspiring psychologists?

If you want a job in an applied forensic field, then trying to gain some work experience would be very useful . It doesn't have to be paid, but volunteer work in a related field will show potential employers your commitment and make you stand out against other candidates. It will also help you decide if it is the right career for you.



'Who moved my cheese' by Spencer Johnson. Deemed useful for distracting oneself from the often emotionally demanding work involved in Forensic Psychology



PsychOut 2011