

THE UNIVERSITY of York

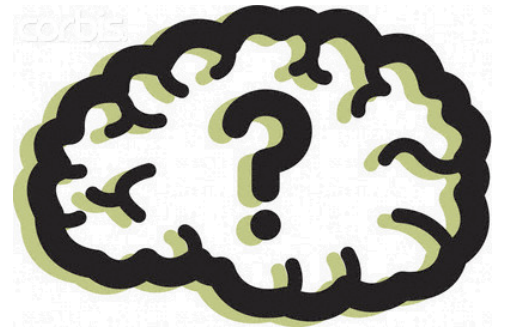
March 2012  
Issue 8

PsychOut

**Mind Over Matter**



**The Power of the Mind Uncovered...**



**Feature:**

Nocebo: The “Flip-Side” of the Placebo-Effect?.....4  
Size Matters: The invisible forces that affect your eating habits.....6

**Meet The Staff:**

The staff at York give us their advice on public speaking and share some memorable (and embarrassing) moments!.....8

**Psychology Around the World**

Why do we believe? Religion from a cognitive perspective.....12

**This Term’s Articles:**

The Physiology of Meditation.....14  
YNiC, Brain Imaging and Face Perception.....16

**What’s Next? What can you do with a psychology degree?**

Interview with a Business Psychologist.....19  
Hips Don’t Lie - the power of body language in interviews.....22

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All references from this issue are also available online.



# Editor's Letter

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## **Welcome to Issue 8 of PsychOut!**

*True to the phrase "good things come to those who wait" we are pleased to finally introduce another fantastic issue packed with all things Psychology.*

*This term our writers have been exploring the theme "Mind Over Matter", referring to the powerful influence the mind can have over the body. As Psychologists we are perhaps a little biased in our belief that the mind can exceed the physical parameters of the body, however increasing research suggests that this is, in fact, the case. Our writers illustrate just how wide reaching this phenomenon is; from the hidden forces that may be shaping our everyday eating habits to the mysterious effect of the placebo, "Mind Over Matter" is much more than the latest David Blaine stunt...*

*Furthering this theme, we also delve deeper into the Psychology behind religion, with a guest-writer from Philosophy sharing his thoughts on the implications of research reporting a neural basis of transcendence. Bridging cognitive and neuropsychological evidence, our writers debate that faith may be more inbuilt than we think...*

*We'd like to thank this term's writers for contributing their hard work:*

*Jennifer Ashton*

*Sarah Bartlett*

*Daniel Bennett*

*Ophelia Groth*

*Antony Yerasimou*

*...as well as our illustrator Jessica True,*

*and the members of staff who shared their brilliant advice in our guide to public speaking.*

**Francina Clayton and Marianne Cezza**

*PsychOut editors*

**Want to get involved in the production of PsychOut?**

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no previous writing experience is required!**





# Features

*This term's feature section is dedicated to understanding the powerful influence that the mind can have on the body.*



## Nocebo: The "Flip Side" of the Placebo Effect?

**Jennifer Ashton** finds out about the lesser known negative psychological effects on health.

### What is a Nocebo?

A 'nocebo' is the opposite of a placebo, whereby a belief or expectation of a negative outcome leads to worsening of symptoms. A nocebo effect is induced by verbal suggestion of particularly negative outcomes with, or without, the administration of a particular substance [Colloca & Miller, 2011]. Examples of the nocebo effect include higher levels of itch and pain reactions in groups who have been primed to expect such responses, compared to non-expectant groups [van Laarhoven et al., 2011] and the report of mild headaches when (non-existent) electrical currents have been passed through students heads [Schweiger & Parducci, 1981].

In contrast to the widely studied placebo effect, currently little is known about nocebo effects. This may be attributed to ethical issues surrounding the verbally induced worsening of pain in clinical patients which may lead to real worsening of pain [Benedetti, 2007]. Whilst nocebo effects can be observed in some natural settings, such as when negative diagnoses are given to

patients, the effect is often studied empirically using healthy individuals on pain and analgesia paradigms, i.e. looking at the way treatment used to relieve pain is experienced when individuals expect or believe a particular outcome. Pollo et al. [2002] studied patients with Parkinson's disease, a progressive neurological condition resulting in tremors, rigidity and slowness in movement. They were given a highly effective anti-Parkinson treatment; however one group expected a good motor outcome and the second group a poor motor outcome. Results showed that the therapeutic effect was modulated by expectation, with the group expecting a poor motor outcome, showing much slower movement.

Understanding the nocebo effect will impact directly on clinical practice, treatment programmes and methods for basic research. Reducing pain through psychological methods and finding neurobiological 'pain systems' will drive the progression of treatment for chronic unyielding pain, which as of yet, is ineffectively treated. Research, however, hasn't come to a single



explanation for the placebo/nocebo effect with findings differing across situations and conditions.



### **Mechanisms of the Nocebo Effect**

Through studying negative expectations of pain, brain imaging has played a big role in the development of neurobiological models. MRI scans have detected corresponding brain activity to the pain felt in real and nocebo responses, suggesting that at a neurological level the pain felt is 'real' and is not psychosomatic [Bingel et al., 2011]. Studies have also shown that negative expectation can amplify the experience of pain. Price [2000] reports that mental representations of a sensory event can significantly shape the neural processes that underpin the formulation of the actual sensory experience, as these two experiences involve overlapping brain regions. This is supported by evidence showing pain-intensity related brain activation that partially overlaps with expectation-related activation in the anterior insula and the anterior cingulate cortex (ACC) [Koyama et al., 2005]. If future research can pinpoint the exact extent to which these brain regions are involved in pain percepts, the development of chronic pain treatments may be successfully developed.

Further research has been able to determine one of the neurochemicals responsible for converting the expectation of pain into genuine pain perception. It was found that anxiety, induced by the anticipation of pain, triggers the activation of cholecystikinin (CCK), a peptide hormone, which in turn facilitates pain transmission. CCK

-antagonists have been reported to block this anxiety-induced increased sensitivity to pain [Benedetti, 2007] and therefore propose a foundation for which new therapeutic strategies could be developed.

### **Nocebo Effects and Clinical Practice**

The evidence suggests that in a clinical setting, it would be an advantage if prognoses and treatment plans were delivered to individuals in a way that would minimize any possible nocebo effects. The law states that individuals should be fully informed of all short and long-term side effects of a treatment, thus it would be impossible to remove all risks of a nocebo response. However, the manner and context in which information is delivered can minimize the effects [Colloca & Miller, 2011]. For example, possible side-effects of treatments can be given in positive terms, using statistical or likelihood odds information, e.g. 'X is a side-effect of treatment Y however Z% of individuals do not experience it'. Described in this way the attention is directed to the slim chance of experiencing a side-effect, rather than presenting the side-effect as inevitable. Management of verbal communication, contextual cues and physician-patient interaction are all important for good clinical practice, and educating patients about the possibility of nocebo responses may also help to minimize the effects.

Nocebo effects are not widely studied, yet have important implications for daily clinical practice. If nocebo verbal suggestions are really powerful in eliciting a negative response, it is important that a doctor's words and attitudes are chosen carefully and expressed in a manner that will not produce anxiety or apprehension in patients. Further research into the neurobiological mechanisms that lead to a nocebo response will be vital in improving health care and creating successful integrative treatments. Although biological mechanisms are clearly at work, the nocebo effect suggests that the mind can directly affect physiological responses of the body.



# Size Matters: The Invisible Forces That Affect Your Eating Habits

**Daniel Bennett** investigates the science behind our eating habits...“get it wrong, get fat!”

Imagine a world where a computer calculates exactly how much food you need, what type of food you need and also takes into account your taste preference. It then pops the meal out of the machine and you eat it. That machine does not exist and so in the quest of getting our perfect diet we face a few problems. At every stage of getting our food from the store to our stomach we are unconsciously nudged in different directions about what and how much to eat. If you've ever found yourself eating that last bit and not knowing why, putting yourself under physical pain from over eating, and even eating food you don't like - then you may have been nudged. We don't just get food, it comes in different sized stuff and we put it on different sized things and so at every step we manipulate these quantity sizes in a rudimentary fashion, and when we get it wrong, we get fat!

We have evolved to live in a very different world than we do. Back on the grasslands of Africa our bodies learnt to eat as much as we could, whenever we had the chance. Meat and fat may have been an especially grand effort to come by but they were also the foods that yielded the greatest rewards. They endowed us with masses of energy giving us considerable advantage over our competitors - so we learnt to crave meat and fat. However, thanks to the farming revolution, meat and fat are no longer hard to come by! Our primal bodies are walking around in a new world

where a bright sign will entice us to indulge in our favourite foods without the struggle and strife of the hunt. But food was never meant to be fast. We must be mindful that in this new world our bodies are instinctively poor at making beneficial food decisions. For example homo-sapiens have a fat store, a kind of biological tuck shop for when a meal isn't available. As useful as this was, with fridges at our fingertips and 24 hour McDonalds for our delectation we no longer require such **u n c e r t a i n t y s t o r e s .**

***"At every stage of getting our food from the store to our stomach we are unconsciously nudged in different directions about what and how much to eat."***

Nobody becomes obese overnight; it's a very gradual process. The 1 in 4 who are obese in the UK come second

only to smoking in their chances of having cancer as well as costing the economy around £7bn per year – size really does matter!



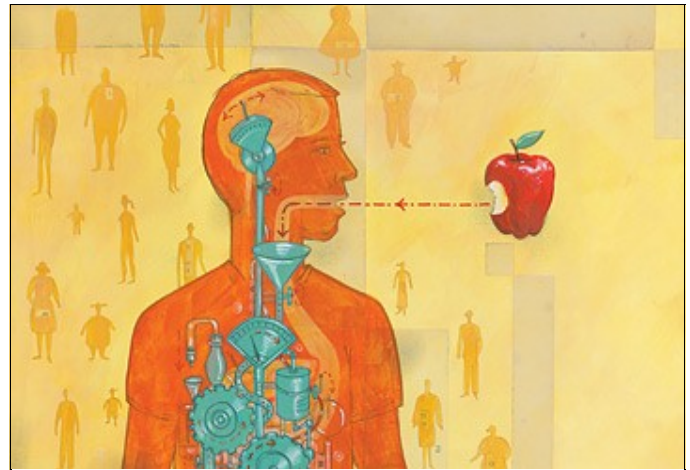
**Research has shown that our eating behaviour is influenced by environmental cues such as how much food we can fit on our fork.**

Portions in restaurants, supermarkets and even cookery books have increased by over 40% in the last 70 years! We rely on these cues as well as the size of packaging to gauge what amount is appropriate and normal to eat – evolution has favoured the eat all you can approach after all!

A great example of this is seeing how much food people put on their plate at buffets. Average plate sizes have grown by a 1/3 since the sixties...and so have we! Use a 12 rather than a 10 inch plate and you'll probably load 22% more food onto it therefore increasing your calorie consumption – the chances are you'll be full before you get to that 22% bonus portion but you'll "finish your plate" nevertheless. We do this with other areas of eating; a larger fork encourages us to take larger mouthfuls and chew less, and we'll pour more into wider glasses as we perceive them to have less volume. The layout of a buffet also unconsciously alters what kind of meal we select. If the chips are at the back you're around 9% less likely to choose them and having tongs instead of a scoop stops about 8% getting on your plate; our environment manages to deceive our ancient programming and we barely notice it!

These figures may seem small when imagined as one meal, but saving 100 calories per day (all else constant) equates to a 2 st. (14kg) weight loss/prevented gain a year without any effort apart from altering your food landscape. The easiest diet is surely the one you don't know you're on. Professor Brian Wansink, the man behind the Food and Brands lab in California, suggests there is a 'mindless margin' in the relationship between actual and perceived eating. The idea is that if we ate 3000 calories we would be lethargic and if we ate 1000 calories we would be weak, yet if we eat 150 calories either side of 2000 then our

***"...a larger fork encourages us to take larger mouthfuls and chew less, and we'll pour more into wider glasses as we perceive them to have less volume."***



**How many of us are eating mindlessly every day?**

minds do not detect a difference - hence the mindless margin - means we can comfortably cut out calories that don't make us feel fuller. We know we can be nudged and we know it's enough to impact our health. This awareness allows us to design the environment so we can save ourselves from our inbuilt biases – a kind of forward planning. So the next time you eat, have a think about how much will actually make you full and how much you're being nudged to consume.





# 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.***

## The Fear of Public Speaking

How to become an epic orator: The staff share their best advice and worst memories on the nerve-wracking feat of speaking in public.

It's estimated that 75% of all speakers experience some degree of anxiety when doing so in public [Hamilton, 2008]. Furthermore, according to the Book of Lists, public speaking is the most common worst fear, followed by heights, insects, and financial problems, with sickness and death ranking sixth!

Forget picturing the audience naked, the three simple rules to vanquish this fear (aka glossophobia, if you're fond of Greek terminology) are:

1. Preparation
  2. Belief in what you're talking about
  3. A lot of practice
- (Dos and Taboos of Public Speaking).

This may all be very well, but can such simple steps really make a difference when you're actually up there, about to reproduce your lunch?

In some cases drugs such as beta blockers are used for a temporary fix for glossophobia, but we don't recommend that! Instead, read on and have a laugh at what your lecturers have been through, and maybe even pick up some tips for the next group presentation.



**Look familiar? If public speaking is something you dread, read on to pick up some fantastic tips from members of staff at York**





**Nick Barraclough:** "Early in my career I was once giving a talk immediately following VS Ramachandran at the Society for Neuroscience AGM. The room held about 400 and about 500 came to see Ramachandran. Eventually it turned out that he was not going to turn up, and about 480 of the audience immediately left the room leaving me on the podium staring at a very empty room. I must have looked very concerned as a random member of the audience even came up to me just before I started to talk to tell me to relax and not to worry! She did stay for my talk, and I always hoped it wasn't out of pity.

As for tips, take comfort in that you are likely know your topic a lot better than your audience, particularly if it is your research. If your audience is more informed than you – don't give the talk...."

**Quentin Summerfield:**

"A New Yorker was walking down 5th Avenue when a stranger approached him and asked 'How do I get to Carnegie Hall?'. 'Practice, practice, practice' came the reply. I can offer no better advice for calming nerves and impressing an audience. Practice your talks on your own, better still in front of your children, and, best of all, give dry runs to members of your research group."



**Andy Ellis:** "When I first started lecturing to rooms full of students I found it a thoroughly nerve-racking experience. My voice would quake and my shirt would be wet through by the end. Now, I no longer experience conscious anxiety, my voice doesn't quake, but my shirt is still damp when I've finished (and no - it's not just that I perspire anyway!). I may feel in control, but at some level I'm still experiencing a degree of anxiety.

Yerkes Dodson Law says that there is an optimum level of arousal for good performance; neither too little nor too much. If you are too aroused or too nervous, your voice will quake and you will forget half way through what you wanted to say: if you are insufficiently aroused or over-confidence you may also fail to do yourself justice.

Nowadays the only time I feel truly nervous is if I am giving a talk to a group my peers who I don't want to consider me an idiot. For those occasions I prepare very thoroughly. I don't memorize the whole talk, but I memorize my opening lines and, importantly, my closing lines (so that my talk doesn't just fizzle out incoherently).

I suspect that the only way to overcome a fear of public speaking is to do it. There are lots of jobs (like mine) where it's inescapable, and you don't want to rule them out because you haven't forced yourself to speak in public on a couple of occasions. Like everything else in life, you will get better with practice, and you can use the basic principle of desensitization, like starting with a few friends and building up to larger groups of people you don't know so well. But it IS a daunting thing to do and it's OK to feel nervous... you may just need a good anti-perspirant or a change of clothes afterwards."

**Beth Jefferies:**

"It seems to really help my nerves if I smile broadly at the audience in those nasty few moments before starting to speak. If you tell yourself that you're NOT nervous, and act as if you have stacks of confidence, it becomes partly true!"



**Peter Bull:** "If you were asked to count from 1 to 10 in public, you would probably think that's ridiculous, anyone can do that! One reason it's so easy is that because you know the material so well, you have no need to worry about reciting it in public. Notably, well-learned tasks are performed better in front of an audience, poorly learned tasks worse, according to social psychological research on so-called "social facilitation".

So the moral is: prepare your material really well, and rehearse it in private as often as you can, until you feel ready for public performance. Then try and perform in public as often as possible. Eventually, you may start to find that talking to one or two hundred people is no more stressful than talking to just one or two. Indeed, you may even find that performing in public is really rather enjoyable!"

**Silke Goebel:** "My greatest fear has always been tripping up on the way onto the podium. At conferences there are often steps for getting onto the stage and quite a few times I have stumbled up...seems to be a self-fulfilling prophecy.

I remember my first talk at an international conference. I was a first year graduate student, I was scared and didn't want to give this talk. It was the largest audience I have ever had (probably close to a thousand), but luckily there was a spotlight so I couldn't see anybody in the audience. There was also a microphone and a bit of a delay on the system, so I had to listen to my own voice while giving the talk – a weird, nearly meditative experience. I took a photo of this hall and anytime after when I got worried about giving a talk I looked at the photo – thinking I survived that one alright, so the next one will be ok too.

In general I think effective techniques are often those that seem counterintuitive at first. For example, speaking slowly – make pauses till it feels painful for you – this is hard to do when you are nervous, but effective in getting people's attention and to build up suspense. Eye-contact is very important too; listeners will be less likely to drift off when they feel they are being watched and also you can pick up whether they understand you. Another way to get people engaged is to involve them in an activity, for instance asking: 'Who in this audience has heard about x? Raise your hands!'".







**Philip Quinlan:** "Sometimes I found it helpful to calm nerves by cracking a joke at the very beginning. The aim is to win people over and show them that regardless of how serious the material appears that does not mean that you cannot have fun with it."

What I should have realised is that there is nothing funny about a rape alarm going off in a lecture. So like Michael Fish might have said stick to the material on the overheads!"



**Katie Slocombe:** "Practice makes perfect – I practice on my own until I'm confident I can do it well, then I practice with a friendly audience before the real thing to get some feedback - if I introduce an audience too early and I make a mess of it, I get more nervous, so the alone practicing is key for me. If I repeatedly stumble at a certain point, I will write out in full what I want to say just for that point, then practice it enough until I know the 'script' off by heart and don't need the notes any more. Avoid doing this for whole talks though, as its time consuming and the talk could then sound over rehearsed and boring."

If you are asked questions listen carefully and take a few moments to think about it before you answer. If you are unsure if you've understood the question start by paraphrasing the question and checking with the question asker – is that what you meant? Be polite and thoughtful in the way you answer – don't be defensive.

Also - if you are using a radio mic don't forget to turn it off / take it off before going to the toilet in a lecture break!"



**Gareth Gaskell:** "We all get nervous. One of my all-time academic heroes, who holds a prestigious endowed chair at an Ivy league university, recently told me that she gets "scared to hell" before she gives a talk at a workshop or conference. I found it very encouraging that even someone so senior and experienced could admit to nerves prior to a talk (which was of course excellent!)."

Another tip is that there is a tendency to speed up when you give a talk. This means you either need to prepare material that will last longer than the allotted time or (ideally) try to slow down when you give the talk. My first conference talk, when I was a student in London, happened to be at York. I had a 30 minute slot and realised to my terror that I had finished after just quarter of an hour. This left me with 15 minutes of torture being grilled by York faculty and various other sadists. A certain Dr. Quinlan, as I remember, was particularly scathing!"





# Psychology Around the World

*Our writers find out more about Psychology across the world's cultures.*



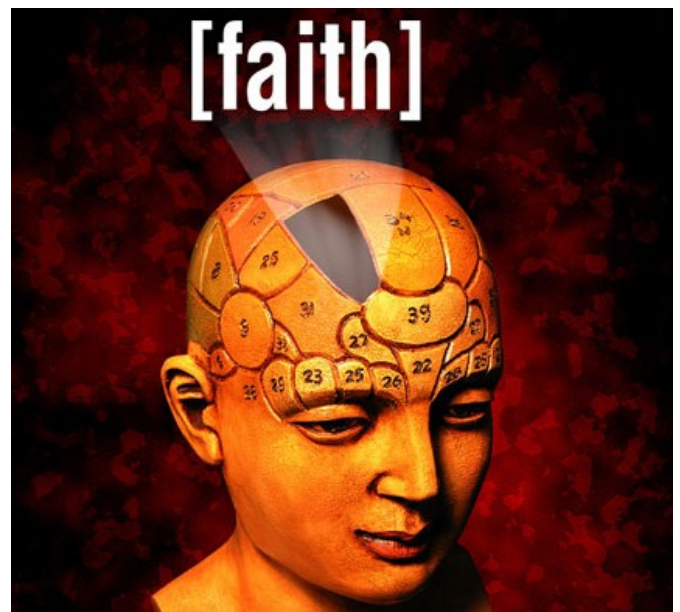
## Why do we believe? Religion from a Cognitive Perspective

Love it or hate it: **Ophelia Groth** examines the universal phenomenon.

From prehistoric burial rituals to the elaborate religions that survive today, religion is a long-established human universal. Every single culture to date has displayed some sort of belief in influential supernatural entities and in an afterlife [Norenzayan, 2010], an enigmatic fact given how few similarities cultures otherwise share. The cognitive science of religion helps explain why humans are so susceptible to supernatural beliefs and why, even in the face of contradictory evidence, we often cling to seemingly unrealistic ideas.

From hearing voices in the wind, seeing faces in the clouds, or seeing the Virgin Mary on a slice of toast, humans seem to innately detect agents everywhere, a bias which is highly conducive to religiousness [Lisdorf, 2007]. Heider and Simmel [1944] classically demonstrated this phenomenon. They constructed a display consisting of a few geometric shapes, moving in a way in which the researchers thought told a narrative. All participants, naïve as to the experiment's aims, overwhelmingly attributed emotions, desires, and human-like traits to the shapes – even when the movement was reversed.

Not only do we detect human-like presence in the world, but we seem to innately believe that everything in the world exists for a purpose. When asked why nonliving things exist, young children tend to respond that pointy rocks and ponds, for example, allow animals to scratch themselves and take a swim to cool off [Kelemen, 1999]. Adults do it, too, if they haven't been educated [Casler &



**Whilst a religion module is unlikely, is it possible that our brains are hard-wired for religious belief?**



**Carl Jung: The foundations of religion are found in the *collective unconscious*, a universal and deeper layer of a person's unconscious**

Kelemen, 2008]. If we're predisposed toward detecting agency, and reasoning that the world is purposefully created, then it's a small conceptual leap toward being susceptible to believing that a human-like god intelligently designed our universe.

Attachment is not just a well-known phenomenon within developmental or relationship psychology: it can be applied to religiousness, too. Christian, Jewish, and Muslim believers turn to God most during distressful times, in the same way that humans typically turn to either their caregiver or lover when facing adversity [Granqvist, Mikulincer & Shaver, 2010]. Followers of these three faiths further see separation from God as being highly distressful: going to hell or letting God down by breaking His moral codes is, to most believers, the worst imaginable fate [Kirkpatrick, 1992]. As a result, most religions contain either gods who are omnipresent and omniscient – for example in Hinduism and Christianity – or at least contain sure means of

gaining contact with gods, as through prayer or going to a church.

If religious behaviour draws on universal cognitive biases and mechanisms for attachment, then how do we explain atheism? Evidence shows that atheists may unnaturally override their religious impulses and that supernatural belief is a cognitive default. When under pressure to provide a quick response, scientifically-educated adults often accept creationist explanations for the world [Kelemen & Rosset, 2009]. Even in nonreligious cognitive tests of inhibition such as the Stroop test or Wisconsin Card Sorting Task, religious participants typically make more mistakes and have less restraint than do atheists. In contrast to what sceptics of religion may say, religiousness may be more natural than we think!



**Understanding maternal attachment may provide insight to understanding the psychology of religion**



# The Physiology of Meditation

**Antony Yerasimou** delves into the controversial interpretations of research in the fast-growing field of neurotheology.

Since spirituality has existed ubiquitously throughout civilization, one might presume that it has been evolutionarily programmed into the brain. In view of the recent advances in cognitive neuroscience, this assumption seems highly pertinent, and studies concerning the cerebral localization of the cognitive processes that give rise to spiritual sensations have certainly highlighted areas of the brain that seem causally implicated in spiritual activity. This is especially true of meditation; a self-regulative practice where the subject focuses on a distinct mental object, blocking out all other thoughts for an extended period of time. Whilst meditation might seem to enable people to experience a loss of self, neurotheology has exposed the physiological reality that underlies this seemingly spiritual phenomenon.

Newberg [2001] used single photon emission computed tomography (SPECT) to measure the regional cerebral blood flow (rCBF) of a group of Tibetan Buddhist monks whilst both at rest, and in their transcendental

high. His results revealed that, during meditation, rCBF increased within the frontal cortices, whilst concomitantly decreasing within the posterior superior parietal lobe (PSPL) – an area of the brain which is identified with spatial processing. Whilst significant, Newberg's findings seem intuitively unsurprising. Indeed, given our trust in cognitive neuroscience, it seems reasonable that we would find differences in brain activity as a result of being in a meditative state. However, if science can provide a neural basis for such experiences, can we still legitimately label them *religious* experiences?

In focussing on a distinct mental object, the meditator's right prefrontal cortex and right parietal lobe is instantly activated. Continuous fixation on this object subsequently creates a loop of increasingly intensive cerebral activity between this and hypothalamic regions, resulting in pleasant sensations. Subsequently, activity in the PSPL is interrupted and the 'self-other dichotomy' is obliterated, causing the person to feel at one with the object of meditation. Accordingly, all sensory information is blocked, and the subject arrives at the most unitary state possible wherein all sense of space and time is lost.

## Does meditation provide a window into the spiritual world?

Whilst, to most Buddhists, meditation is considered a self-regulative practice which enables them to bring mental processes under greater voluntary control, a minority consider it a *spiritual* gateway. The spiritual characteristics of meditation are, for the most part, due to the imbalanced functioning of the



Please Sir... we need you to stop floating to take an accurate scan...



causal and holistic operators in the left and right PSPL, respectively. The former performs the analytic task of causally ordering events as experienced by sensory perception, which is reduced during meditation. Whereas, the latter refers to the brain's ability to abstract from details, viewing reality as more than the sum of its parts, and this continues to function regularly during meditation. When the left PSPL is deactivated, the subject experiences a general sensation of absolute unity with the object. However, this imbalance also generates the feeling that one has entered a supernatural reality. This is because the holistic operator is functioning exclusive of the causal operator. Accordingly, when the subject's left PSPL is deactivated, they not only lose all understanding of the dichotomy between self and other, but they also lose all sense of causal order. Since the subject's experiences are being presented to him/her holistically and devoid of all order, supernaturality may indeed be inferred as a result of this.

In apprehending a scientific explanation of meditation, neurotheologists have not simply dispelled the dated suggestion that meditative experiences are *mystical*. Indeed, the rejection of such a suggestion is inevitable in the development of scientific knowledge – as science progresses, so too will our scepticism of the spiritual world. Thus, what these findings do provide is food for thought. If meditative experience can be explained scientifically, can't all other religious experiences be explained correspondingly? Whilst this article has specifically focussed on



**Research into the spiritual state has been carried out with followers of a variety of faiths.**

meditation, similar experiments on Franciscan Nuns, and also Sikhs, have produced analogous physiological explanations for the spiritual manifestations experienced.

Therefore, if scientific inquiry is able to explain all spiritual experiences, is this to the detriment of religion? I, for what it's worth, don't think so. Whilst religion may need to concede that the union of the human soul with God (*unio mystica*) is indeed unachievable, the human brain ultimately seems hardwired for such 'spiritual' experiences. Although during these experiences, the mind may not be traversing the spiritual world and interacting with a higher reality, the subject is at least achieving a tranquil foray into a profound private sanctum. Therefore, though neurotheology may have demystified these experiences, it has neither negated their benefits, nor compromised their significance.

***"...if science can provide a neural basis for [meditative] experiences, can we still legitimately label them religious experiences?"***



## YNiC, Brain Imaging and Face Perception

**Marianne Cezza** provides an overview of the neuroimaging facilities at York and how their use has led to new research on face perception and the recognition of emotions.

The development of neuroimaging as we know it today began with computerized tomography (CT) in 1971, revolutionizing neurology and psychology, followed shortly after by MEG with multiple sensors in the 1980s, and the first fMRI image in 1990 [Filler, 2009]. fMRI, the most popular method of brain imaging, was of course of particular importance to psychology for functional localisation. So it is for this reason that in the Science Park lies quite the asset to our department: YNiC (the York Neuroimaging Centre). Established in 2005, it was a £5.2 million project set up to serve several faculties in their research into molecular and cognitive neuroscience, including Psychology, Chemistry, Electronics and Computers and Health Sciences. The centre is also used by pharmaceutical companies, private healthcare, the Hull-York Medical School and the NHS ([ynic.york.ac.uk](http://ynic.york.ac.uk)).

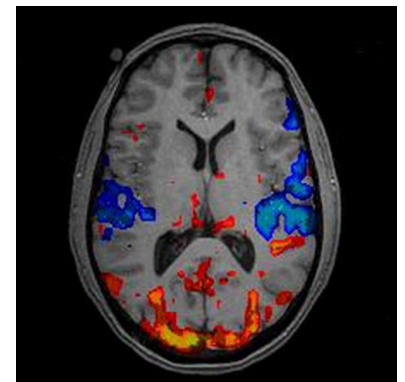


### Magnetencephalography (MEG)

MEG is a non-invasive method of brain imaging that displays neural activity. The machine, located in a magnetically shielded room, is a whole head scanner, in which a participant rests their head whilst sitting in the hydraulic chair. MEG measures the magnetic fields around the outside of the head which are sensed by Superconducting Quantum Interference Devices (SQUIDs). These magnetic fields are produced by electrical activity in the synapses of brain where the flow of certain chemicals generates action potentials to travel across neurons and alter Post Synaptic Potentials (PSP). A region of 50,000 neurons is needed for the SQUIDs to sense the neural activity from the magnetic fields ([ynic.york.ac.uk](http://ynic.york.ac.uk)), however, it allows for an improved spatial resolution [Ward, 2010].

### Functional magnetic resonance imaging (fMRI)

Vital to the research of cognitive psychology, fMRI measures the change in blood flow – haemodynamic response (HRF) – to correlate areas of the brain with certain functions. When neurons are active, blood supplies them with more glucose than inactive regions, oxygenating the haemoglobin in the blood and therefore, making these areas evident against others marked with deoxyhaemoglobin, which is reflected by Blood Oxygen Level Dependence (BOLD) MRI.



### **Electroencephalography (EEG)**

In addition to the 248 channel MEG, the centre also has high density 96 channel EEG technology. This records the electrical activity of a population of neurons firing (spikes) by the placing of electrodes over the scalp. EEG is useful in clinically diagnosing disorders such as epilepsy but is also of great use in psychology to measure event-related potentials (ERPs) which are elicited directly from perceptual stimuli or thought.



### **Magnetic Resonance Imaging (MRI)**

The GE 3-Tesla HDx Excite MRI scanner at the centre works by transmitting an electromagnetic field which disturbs the hydrogen protons in the water molecules of the body. The more intense the magnetic field, i.e. the higher the tesla, the more the alignment of the body's protons are disturbed. When the field is turned off, the protons decay to the original state and the difference in energy between the two states can be seen by the release of photons, detected in the scanner. Different substances in the brain can be identified as they return to their normal state at different rates (T1 relaxation time); this results in a 3D image of the different tissue types.



### **Transcranial Magnetic Stimulation (TMS)**

As of 2008 YNiC also includes the TMS lab. TMS is a method used to understand the processes of excitation and inhibition in neurons in the brain. This is done by depolarizing the neurons with electromagnetic induction of electric currents using a rapidly changing magnetic field.

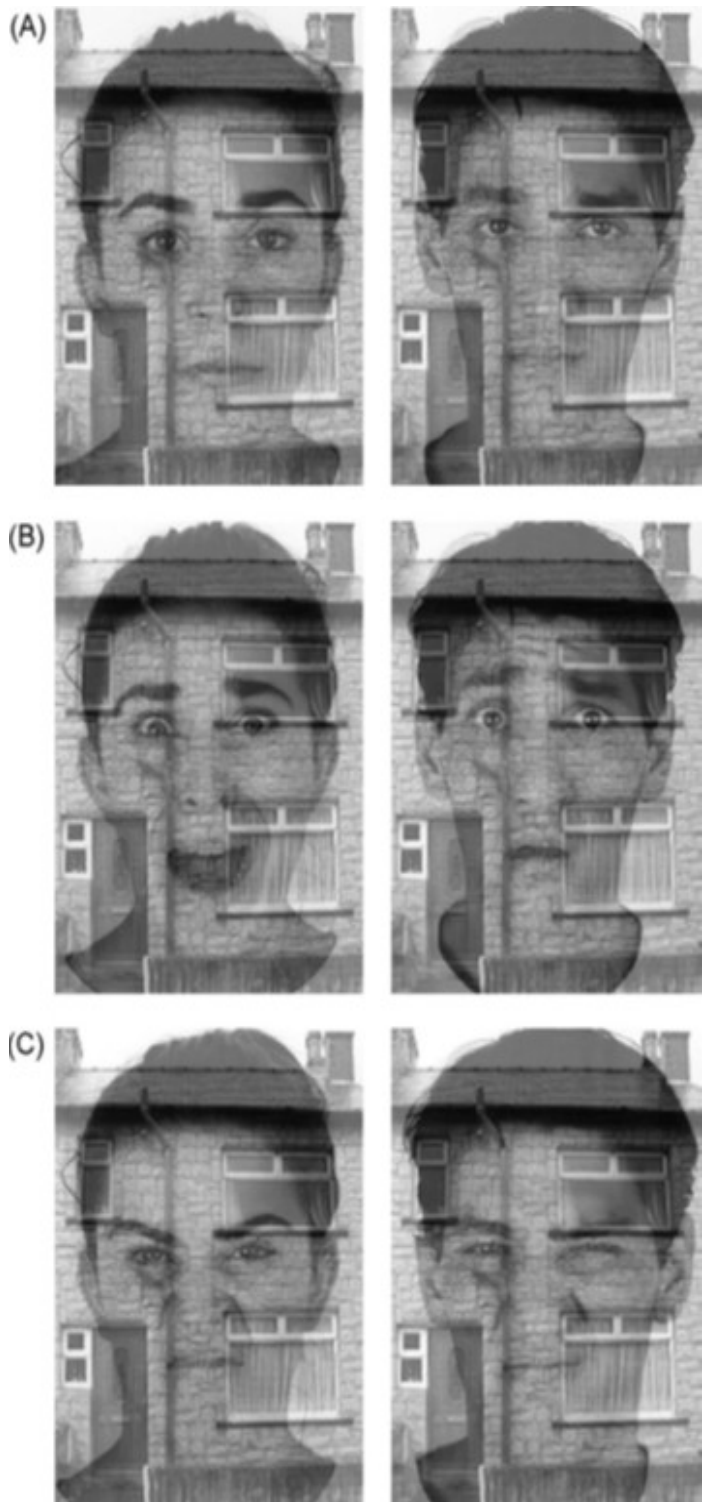




Research at the neuroimaging centre ranges from Psychology to Chemistry and includes work on hyperpolarisation of neurons, visual perception and disorders, semantic dementia and word recognition and learning. Professor of Neuropsychology, Andy Young, has published over nine studies to date using YNiC in his research on face perception, recognition of emotions and social judgement. From a face we can recognise a person, their emotions and draw information such as age and gender. Current research in this area is mostly based on earlier theoretical models of face perception such as Bruce and Young's cognitive model of the perception of familiar faces [1986] with separate routes for the recognition of facial identity and expression.

Neuroimaging, in particular fMRI, has proven central to findings in this domain; Andrews et al. [2010] found that the internal (nose and eyes) and external features (chin, hair, face outline) of a face are represented holistically in face-selective regions of the human brain i.e. the fusiform face area (FFA). fMRI was used in another of Young's studies to establish that the amygdala can use information from several facial cues, not just the eyes [Asghar et al., 2008]. Another study using YNiC discovered different neural mechanisms that are employed when perceiving fear and disgust [Santos et al., 2008]. This was found by using ERPs to measure different activity patterns in the brain when shown stimuli of fearful or disgusted facial expression overlapped with houses. This was done in order to contrast results with object recognition.

In summary, brain imaging has taken research in Psychology, among other areas, to a new level; much of the research in the department could not take place without the use of these various neuroimaging techniques at YNiC. Neuropsychological work on areas such as face perception, now rely on the ability to obtain detailed scans of the brain.



**Stimuli used in Santos et al. [2008] which investigated the role of attention on processing different facial expressions.**

**To find out more about the facilities and research at YNiC and the opportunity to participate in some neuroimaging research please visit:**  
**[www.ynic.york.ac.uk](http://www.ynic.york.ac.uk)**



## What can you do with a Psychology degree?

**Francina Clayton** asks **Oberdan Marianetti**, Head of Retail Banking & Wealth Management Academy HSBC, about his profession.



### What inspired you to become a Business Psychologist?

I have always been interested in the workings of the brain and the subject of survival. One evening, while attending a lecture about stress in the workplace, I found a link between the two topics and discovered the desire to pursue this further. It was an Organisational Psychology lecture and at that moment I decided to apply for the MSc. I have loved every minute of this journey since.

### Tell us about your time as a student.

I have lived through two separate experiences of university. The first was in Rome at the Università degli Studi di Tor Vergata, where I took Physics. The second was in London at the University of East London (UEL), where I studied a BSc and MSc in Psychology while on full-time employment.

The two experiences were deeply different for reasons beyond the nature of the subjects and the location of study. Studying Physics was part of my journey as a student through the Italian academic system. While I had chosen the topic, it almost felt as if it was “the thing to do”. Studying Psychology, however, was a choice I made as a ‘mature student’ – I did not really like that label, I was barely 30. Despite being in full-time employment at a busy media company, I clearly remember the feeling of peace and satisfaction at sitting in class every Tuesday and Thursday evening, doing something because I loved it, rather than because it was “the thing to do”.

I spent 6 years at UEL studying a BSc and an MSc on a part-time basis. It was tough managing the job, the studies, a relationship, a social life all at once, but I will always be grateful for having had the opportunity for that journey.



### **How do you apply your knowledge?**

Considering the context, I am assuming the question is focusing specifically on psychological knowledge, however there is much value in considering our full body of knowledge at all times (see S. Job's reference below about typography).

What I know helps me move forward in every moment of my life. In every human interaction I have there are skills and knowledge I apply to understand, connect, influence, motivate and lead, only part of which I have acquired through my Psychology studies. I find great value in testing and using them towards best outcomes. The body of Psychology is particularly useful in my work. I am currently responsible for the Learning department of the Retail Bank of a global organisation and my knowledge proves useful in all aspects of my job: from the technical work of designing strategic learning and organisational development (OD) solutions, to the standard stakeholder interactions, to the leading and management of my team.

### **What has been the most defining moment of your career?**

My career has been varied and to a large extent, unplanned. I have experienced many defining moments. Rather than pinpointing a particular one, I would say that a defining event was realising the method by which I was progressing professionally.

As psychologists you have probably come across the term Mindfulness (see references below for further reading) – a state of mind that, cultivated regularly, promotes an inclusive and authentic experience of the present moment. I have been interested and have studied mindfulness for some time and I try to apply its principles to my way of being on a daily basis. I have learnt that by being present and open to every moment of my career I have recognised opportunities that aligned to my aspirations and I have made decisions – at times radical and courageous – to follow them through.

### **What do you enjoy most about your work?**

I get a particular buzz from seeing patterns, synthesising various inputs of information and creating solutions. I often think of myself as a modern Sherlock Holmes. Much of my work requires getting under the skin of organisational, strategic issues and finding solutions that fit the business strategy and deliver positive impact to the business, its employees and its customers. As you say in English it is "a match made in heaven".



### **How important has research been in your career?**

Research has been very important to my career, both as a method and as a source of information. When deploying new Learning and OD solution there is always a cost attached to the initiative, often a substantial amount. It is therefore important that the business leaders can see how their investment generates a return. I often use an experimental or quasi-experimental approach, engaging metrics, control groups and data analysis as a way to test and demonstrate positive impact. The use of research data adds evidence to our claims and therefore helps us justify the investment...and hopefully get more the next time.

As a source of information research is what keeps me fresh, interested and commercial in my profession. There is absolutely no need to be a research-junkie, but it goes a long way to establishing credibility in one's recommendations when one can quote the reasons or assumptions made in devising a certain approach.



## What advice would you give to a student hoping to pursue a career in Business Psychology?

There are endless possibilities in the public and private sectors, both as an independent professional or an employee in an organisation to pursue a career in Business Psychology. So I hope it would be more useful to offer a suggestion about you as an individual.

Most of our education is driven by competition, ranking, grading and fixing “problems”. Think of your days in school and the way in which you were taught. Think of your being at university and the way your academic progress is assessed. The focus is often on improving or fixing the things we are not so good at and striving to study hard to achieve the higher grade. I would propose that a healthier approach would be to focus on what we are good at and striving to study hard because we love to learn. The grades and the ranks will follow.

There is abundant research that shows that people flourish when paying closer attention to the things they love doing and that they are ‘naturally’ talented for. There will always be ‘weaknesses’ that is natural and can be addressed if they are restricting progression on your chosen path.

So my advice is this:

- Be true to yourself. Look inside and ask yourself: “what are my passions?” Explore, discover and nurture your passions.
- Believe it is possible. Have you ever looked back and thought: “I am not sure how it happened; it just did...almost as if by magic”?
- Keep your eyes open to the Now. A quote in a favourite film of mine goes like this: “Yesterday is history, tomorrow is a mystery, but today is a gift. That is why it is called the present”. A bit cheesy perhaps, but there is a profound message in it.

Below I have included a few references that will help you explore some of the topics I have shared with you here. It includes a video by one of my idols Steve Jobs, which he delivered at Stanford University in 2005.

Be well and enjoy the journey.

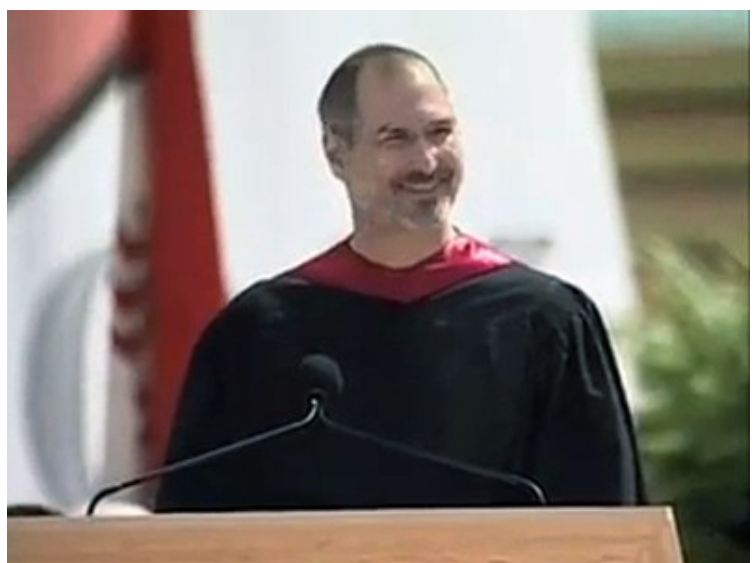
### References

Marianetti, O., & Passmore, J. (2008). Mindfulness at work: Paying attention to enhance well-being and performance. In P. A. Linley, (Ed.) Oxford Handbook of Positive Psychology and Work. Oxford University Press

Mindfulness References – <http://www.omarianetti.com/downloads.htm>

Linley, A., Willars, J., Biswas-Diener, R. (2010) The Strengths Book. United Kingdom: CAPP Press.

Steve Jobs’ 2005 Stanford Commencement Address – <http://youtu.be/UF8uR6Z6KLc>



**“Stay hungry. Stay foolish.”**



# Careers

## What can you do with a Psychology degree?

*Discover courses and careers in psychology.*



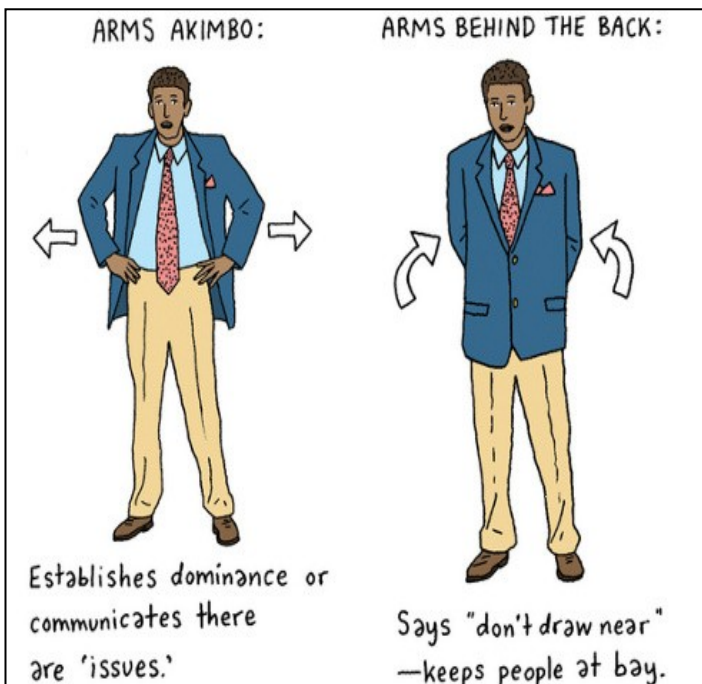
### Hips Don't Lie

**Sarah Bartlett** gives us some body language tips to make acing an interview as easy as the Cha-Cha Slide.

We've always been told by our parents and teachers to sit up straight and unfold our arms, but how important is our posture when we're in that all important job interview? Psychologists have increasingly researched the meaning of body posture and how it might be interpreted. You might be quite surprised as to what feelings or attitudes you

might be portraying with the way you are stood or sat!

Understanding your own body language and the body language of others is essential to being a master of communications, and these 6 tips could enlighten you...



#### 1. Don't overestimate your energy level

Many people think they're being more energetic than they actually are, and so they are portrayed by the interviewer as unenthusiastic, or even bored! Red Bull anyone?

#### 2. "Look into my eyes, no not around my eyes"

People generally maintain eye contact just 40-60% of the time, and what could be more of an important time for eye contact than a job interview?! Looking around the room too much signifies evasiveness or nervousness, so take a short break (probably not enough time for a Kit-Kat) after you've been asked a question just to think carefully about your answer.

**Execute your 'armography' Craig Revel Horward style.**



**Power dressing taken a little too seriously?**

### **3. It's all in the hand movements**

Gesturing while we speak has been known to improve our use of words and structuring of sentences. So next time you're in a job interview, just act as you naturally would in conversation and let your gestures conduct your speech flow. Martin Luther King, eat your heart out.

### **4. Don't be so defensive**

A study showed that people who sat with their arms and legs folded remembered 38% LESS information than people sat without folded arms and legs. So let your guard down a little, the interviewer wants to get to know you, and it's important you're in a state that allows you to take in what they say!

### **5. The FEET have it**

Surprising, some might say, but funnily enough our feet subconsciously dictate where we want to go. So make sure yours aren't pointing to the little green man running out of the fire escape! Your interviewer may pick up on it. Either that or they've got an obsession with your feet...

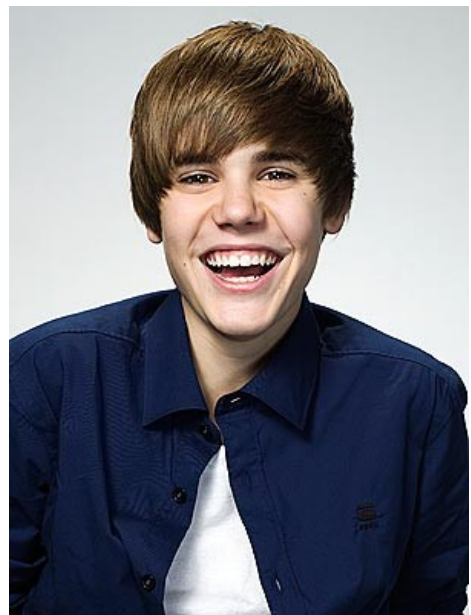
### **6. "You smile, I smile"**

Justin Bieber certainly knew his fair share of neuroscience! Smiling and nodding at appropriate moments in the interview will cause your interviewer's 'mirror neurons' in his/her brain to fire and in fact cause them to smile too. So you've put them in a good mood, why wouldn't they want to hire you?

*Here's a link to the original article online if you're interested... <http://www.prdaily.com/Main/Articles/10016.aspx>*

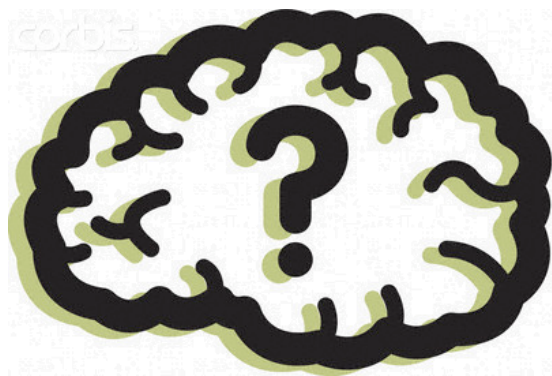
*If you liked this article, there are many, many more at [www.graduategame.com](http://www.graduategame.com), go take a look! The Graduate Game is a free online resource for graduates, helping with everything from CVs to psychometric tests, so it's there for you to take full advantage of!*

*Signing up is free, and our new website allows you to upload your own creative work; anything to do with student life would be great! You can also interact with other members in our forums, and share any advice you may have for fellow students. Follow us on twitter: @gradgameyork for daily tips, or like us on facebook: The Graduate Game.*



**Who wouldn't hire this guy?**





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