Art.

And the Brain.
Beauty lies in the eyes of the beholder. With the current issue of the CNS Newsletter in your hands, we hope that this popular quote by Plato repeatedly comes to mind. In this issue on art, creativity, and the brain, a professional artist tells us how she uses eye movements to create art. We also have fascinating pieces on how music, dance, and singing can influence our brain and intelligence. Flip through the pages and you’ll find some unconventional neuroscience art on display!

It doesn’t stop here! Read about how a new computer program can create music tuned to your specific mood in *The Artful Algorithm*. Speaking of mood, we have also included articles on how mental illness and psychedelic drugs affect creativity, and a report about an exhibition in Berlin featuring art made by psychiatric patients.

Instead of constantly writing about other researchers’ work, we recently decided to turn the tables and start giving our very own MedNeuro students and alumni a platform to present their research. What is the smoking-thrombolysis paradox? A MedNeuro alumnus who did pioneering work on this fascinating phenomenon tells us its story. You could be featured next if you send your contributions to cns-newsletter@charite.de!

To help inform our readers about the different career paths related to neuroscience, the newsletter brings you an exclusive interview with Emilie Marcus, the Editor-in-Chief of *Cell*. Emilie gives us new insights into her job and tips on how to improve our own editing skills.

Finally, before you turn this page make sure you follow this link www.medical-neurosciences.de/en/about_us/newsletter/team. We’ve given the newsletter’s webpage a brand new look!

Till the next issue... happy reading!

Ahmed Khalil and Apoorva Rajiv Madipakkam
Editors-in-Chief

**Contest**

We are always interested in including your contributions. You can submit anything you see fit on the topic of neuroscience. Send us your most exciting microscopic pictures, a creative photo, thoughts on neuroscience or self-written poems – whatever comes to mind! The best contribution will be published and rewarded with the book “Welcome To your Brain”. So, what are you waiting for? Start the engine of your mind and get going! Trust us, it is worth participating! Send your contribution to cns-newsletter@charite.de to win. **Deadline for submission for the next issue: July 24th, 2015.**

This issue’s winner is Claudia Bentz for all her fantastic, creative contributions which include articles such as, *The Miracle in The Shoe Insole*, *Can Music Make Me Smarter?*, *The Art in Scent*, the interview with the Editor-in-Chief of *Cell* – Emilie Marcus and her very own artwork hidden among her cell stains. Thank you very much for all your contributions!
2 (Brains)-in-1 (Human)?
Creativity Does Not Rely Only on Half of Our Brain

You might think you are left-brained – analytical and logical, or you might think you are right-brained – creative, passionate and sensual. But what you must know, is that you are neither. Creativity, analytical thinking or sensuality are not produced by only one hemisphere.

**Myth Creation**
The thinking of left versus right hemisphere started with Paul Broca’s studies [2]. He believed that the dominant hemisphere (the one that is involved in language perception to a higher degree than the other) is usually on the side opposite to the dominant hand – a fact that turned out to be false.

However, the left brain versus right brain myth came from studies performed by Gazzaniga and Sperry on split-brain patients. These are patients whose corpus callosum (the fibres in the brain connecting the two hemispheres) were sectioned in order to stop epileptic seizures from propagating from one hemisphere to another. Gazzaniga and Sperry showed that the left and right hemispheres are responsible for different cognitive functions, such as language production, language comprehension, calculations or drawing [1].

As it turned out, abilities such as language production and comprehension, writing and advanced calculations were possible with use of the left hemisphere only. Drawing, simple mathematics or language comprehension could be performed using only the right hemisphere [1]. The left versus right brain statements are now supported by studies showing anatomical asymmetries between the two hemispheres, exaggeration or loss of which might lead to special abilities or deficits, respectively [3, 4].

It wasn’t difficult for journalists to put these facts together and create pictures of right-brained and left-brained people who have completely different features and can perform completely different tasks. The right-brained people are supposed to be extremely creative and think outside the box. But Rex Jung, a neuroscientist focusing on the neuroscience of creativity, says that this is not the case [5]. First, let us consider the processes of creativity, and second, the plausibility of two hemispheres having different functions.

**Whole-Brain Creativity**
In his review, Jung presents a number of theories on creativity [5]. Using creativity tests and neuroimaging measures, scientists found some brain regions responsible for creative thinking. Not surprisingly, they are not all in the right hemisphere. In fact, results suggest that communication between many brain areas in both hemispheres is important for the creative processes. Scott Barry Kaufman, another creativity scientist, claims that there are three main networks involved – the executive attention network, the default mode network, and the salience network [6]. None of them is confined to a single hemisphere.

Interestingly, however, transient inactivation of the left temporal lobe improves drawing skills [7]. This is considered to be the effect of blocking mindsets: previously acquired information that interrupts creative thinking and makes us conform to the norms of the world we live in. So is the left hemisphere just an enemy of creativity? It is hard to say. As Jung says, we can only begin to discuss the neural correlates of creative processes. Nevertheless, we know some other facts that may help us solve this problem.

**Myth Destruction**
There are a large number of studies suggesting that most of the cognitive processes in our brains rely on both hemispheres. A recent resting state functional magnetic resonance study showed that there is a large variability between people when it comes to the lateralization of functional networks involved in certain cognitive processes and that being left- or right-brained is not a global property [8]. Additionally, while language functions rely mostly (yet not exclusively) on the left hemisphere and interhemispheric connections, visuospatial and attentional processing, which are usually said to rely on the right hemisphere, rely in fact on many synaptic inputs from both hemispheres [9].

If that does not convince you, maybe this will: it turns out that an inverted lateralization occurs in 4% of strong right-handers and up to 27% of strong left-handers [10]. The dominant hemisphere in these people is right. Could we, in this case, say that their left hemisphere is the creative one, and the right one the analytical one? I don’t know. But what I know for sure is that we cannot state that anyone is right-brained or left-brained.

**References**

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Source: Planetary Brain, Adrian Kenyon, flickr.com
In Between Glances

Eyegaze is an important non-verbal signal in social contexts. The gaze between a mother and child is essential for the latter’s forebrain development. We can actually ‘feel’ if someone looks at us or turns their eyes away from us. Our gaze can be ambiguous, promising, significant, provocative or empty. We establish eye contact to confirm attraction, consent or disapproval. To some extent, we become ourselves through the eyes of the other.

Although mechanical eye-tracking apparatuses have measured human gaze since the 19th century, its visualization has been possible only with the development of modern technology. Today, an eye-tracker consists of a video camera that registers eye movements and a computer program that analyses and presents the recorded data as visible lines and points. As data is recorded in x and y coordinates, the position looked at can then be exactly located on the image. The eye movements that are used to make art are fixations and saccades. Fixations are events that last for around 120 ms or longer, while saccades are movements the eye makes wandering between fixations. While the eye “sees” during fixations, it doesn’t during saccades.

Artists such as Alberti (1404 – 1472), Da Vinci (1452 – 1519) and Dürer (1471 – 1528) first investigated visual principles. These and other contemporaries developed contraptions that helped them reduce a three-dimensional object to true nature: For example, a pane of glass was covered with parchment paper so that the outline of an object behind the pane could be copied directly onto tracing paper. Or, a frame with a built-in grid of strings was placed in front of an object in order to transfer its outline onto a drawing surface, marked by equally-spaced horizontal and vertical lines. When a string was led between a nail on the wall (the viewpoint) through this rastered frame (the image plane), it was possible to copy every point of the object the string touched.

“Looking at Art Can’t Be Separated from Our Lived Experience of the World and the Image Exists in My Perception of It”. SIRI HUSTVEDT

“Inside-Outside”
The eye-tracking installation “inside-outside” is based on the principles of the devices devised by the fathers of perspective representation mentioned above. The artwork reflects the gaze through a window frame in and out of a gallery: A mobile eye tracker tracked the gaze through the window into the empty gallery space. Then, from inside the gallery, the eye followed the movements of pedestrians and cars on the street. The two eye-movement recordings were subsequently converted into drawings and plotted onto two sandblasting foils. Both sides of the windowpane were sandblasted. The traces of the gaze into the room were visible on the outer surface of the windowpane; the inner surface of the windowpane featured the gaze on the street. On each side of the glass only the path the eye had pursued was transparent. Thus, only those places where the gaze from inside and outside crossed still allowed a look through the window. The eye tracks resemble the traces of a finger run over the surface of frosted glass.

“Inside-outside” looks in two directions as well as onto a static and moving situation. While we are able to control our eye movements on a motionless scene, the eye follows movement reflexively. The glass pane no longer presents itself as a border between the inside and outside in this installation. But most importantly, the eye as the perceiving organ is the performing organ all at once: observation and representation blend without a detour via the artist’s hand.

“Eye2eye”
The interactive installation “eye2eye” focuses on mutual gaze: Two people—a man and a woman—were looking deeply into each other’s eyes, with one of each person’s eyes being filmed. The movements made by this eye while observing its counterpart are recorded as visual tracks. This gave rise to videos of two eyes, with eye-tracker recordings of the movements made by each of these eyes while watching the other eye. Both seeing and being seen are blended on the...
screens, becoming simultaneously visible and exchanging places. Gradually the track of one eye covers the image of the opposite eye like a black doodle.

While art may speak to all our senses, we depend on our optical organ in visual art. In art, the eye symbolizes both seeing and gaze, invisible faculties and processes. The gaze can also stand for the principles of the works’ composition (the construction lines of a painting for example) which, in turn, may contribute to its meaning. “I see” can also mean “I understand”.

A work of art is made for no other reason than to be perceived. We not only bring our eyes to what we see. We bring our intellectual faculties and our emotions, our whole self with its whole story. The relation is between the work of art and us. This relation “partakes of the artists being as well, his entire being, which is why we treat art in a different way from utilitarian objects like forks, no matter how attractive those forks may be” [1]. How we interpret a work of art depends on our attention, our interest in and our knowledge of art, our experiences and expectations, as well as the context and time in which it is presented – in other words the work of art is co-created by our momentary frame of mind.


For the Eyes... By the Eyes

Among the many marvelous things we can do with our eyes, the top of the list being seeing, we can now add writing tool! Did you know that we can control our eye movements to actually write legible words? The picture shows you our attempts made at writing words using only the movements of the eyes (yes, only the eyes and not the head) while an eye tracker recorded these. The little dots represent fixation eye movements and the lines connecting two fixations are saccades (read the article above ‘In Between Glances’ to know more about eye movements and art).
Focal Cerebral Lesions and Painting Abilities

Lesions in the left hemisphere are more often related to the loss of capacity to depict depth and three-dimensional space. Affected artists sometimes try to compensate by exaggerating their use of shadows, like the Bulgarian landscape-painter Zlatyu Boyadzhiev (1903–1976). Also, these painters tend to fill the whole canvas, leaving no empty space, usually at the expense of detail [4].

Another well-studied example of left-hemisphere aphasia is that of a Polish painter who could not reproduce a symbolic content in his paintings following aphasia, while his other artistic skills remained intact [5].

On the other hand, or ore accurately on the other hemisphere, painters with lesions in the right hemisphere tend to build more global images after the lesion, while the loss of tridimensionality is even more pronounced than in painters with left-hemisphere lesions. In contrast to the latter, painters with right-hemisphere lesions recover at a much slower rate and it is doubtful whether they ever regain their original abilities. They also repeat motives and themes that they implemented before their incident [4].

The case of the German painter Lovis Corinth (1858–1925) is an interesting example of a painter with right-hemisphere stroke that noticeably altered his artistic style. Despite his left-sided weakness and neglect, he remained active as a painter until his death, 14 year after the stroke. Some of the changes that characterized his post-stroke work include the loss of contours, lack of correct perspective, misplacement of details and increased subjectivity. This can be seen in his self-portraits two years before and six years after his stroke (see picture) [2].

The use of colors is not hemisphere-specific and is reduced irrespective of the location of the lesion. This has been attributed to a disorder similar to color aphasia, namely the difficulty or inability to distinguish and name colors [1]. Motor impairments, more often seen in painters with left-hemisphere lesions, can also restrict artistic skills by affecting the dexterity of the right hand. However, in many cases, the use of the left hand compensates adequately for the right one [1]. Finally, of note is that the artistic skills of professional painters seem to be less vulnerable to cerebral lesions than those of amateurs. A possible explanation would be the more extensive cortical representation and the recruitment of other brain areas [2].

The location of the brain lesion is related to specific changes in the artistic style of the painter in terms of theme, tridimensionality and the use of color [1, 2, 4]. Despite the difficulties in conducting studies on this topic, their findings could shed light on the mechanisms and the anatomical areas involved in the perception and creation of what is perhaps the most complex human cognitive function – art!


Andreas Diamantaras, Msc Student, MedNeuro


Source: www.commons.wikimedia.org
Artists Who Overcame Sensory Disabilities

Disability is an umbrella term that refers to impairment, activity limitations and participation restrictions. It reflects, therefore, an interaction between features of a person’s body and features of the society in which he or she lives in [1]. Impairments may include physical, sensory, cognitive or developmental disabilities. Depending on the type of limitations or restrictions a person has, disability can be categorized as hearing, visual or motor impairment, among others.

Sensory Disability
This classification includes impairments in one of the senses and it is primarily used to refer to vision and hearing impairments. Our senses provide information from various modalities: not only vision and audition, but also taste, the vestibular system and proprioception which humans need in order to function. Therefore, impairment of one of these functions may result in difficulties in different life activities, including leisure and work [2, 3].

There are several examples of how some people overcame their disabilities to master the art of music. The question is: how did these people achieve that? Beethoven is remembered for his ability to compose classical music after completely losing his hearing. He tried several ways of making the most of his remaining audition before it completely disappeared. For example, he had the legs of his pianoforte (an early model of the piano) cut off, so that it was sitting directly on the floor. By laying on the floor in front of the keyboard, he could feel the vibrations while he played, which helped him to compose [4].

Evelyn Glennie: Sound in Silence
Evelyn Glennie is the world’s foremost solo percussionist and, as most concede, also the world’s first full-time solo percussionist. She lost her hearing in childhood and her school percussion teacher, Ron Forbes, told her to stand by the classroom wall while he played notes on the timpani. Eventually she could match the perfect pitch just as she used to before deafness, and it was the sound waves that made most of the difference. She is able to feel low sounds in her legs and feet and high ones typically in particular places on her face, neck and chest [5]. During her performances, her feet are bare and this allows her to feel the vibrations. She is not only a phenomenal musician but also an outstanding lip-reader which enables her to understand what others say. To hear a sound, all she does is listen [6].

Art and the Disordered Eye
The fear of most artists is how their pieces will be perceived by the public: whether they will be accepted, or whether they will be able to make money out of them. However, the one biggest fear that most artists have is losing their eyesight. As artists rely on their vision to create and paint, losing this function can have great impacts on their career. Although blindness is debilitating, it did not stop some artists from creating art. There are famous blind artists, who kept pursuing their passion to produce art material. Can you think of any famous artist who painted in spite of their failing eyesight? Some of them were: Dmitri Brambilla, John Brambilla, Esref Armagan and Le Duy Ung. Other famous artists who continued to paint despite their vision loss and color deficiency were Claude Monet and Van Gogh respectively. Claude Monet was diagnosed with nuclear cataracts in both eyes at age 65 and began to experience changes in his perception of color. Even in this state, he continued to paint his famous water lily series [7]. Van Gogh, although being color blind, made beautiful drawings and paintings that offered new eyes on the world, allowing us find out what it means to see in a different way. His paintings are worth millions of dollars today, even though he died at an early age and could never see the extent of his work’s impact [8].

Regardless of people’s limitations, they can still overcome barriers and achieve their dreams. Interested in reading more? Yes: then please visit the link [http://bit.ly/InGe4th].

[6] PBS Interview, 1999
Creativity and Mental Disorders

Room For Divine Inspiration?

Though usually considered negative, some theories argue that mental illnesses might be associated with higher creativity and verve. Going back to the Classics, it was believed that “inspiration” was a gift bestowed upon fortunate individuals not by the power of their reason but by the Gods, in particular Muses (the nine daughters of Zeus). Especially during Romantic times, anecdotal accounts raise links between mental illness and creativity to the level of doctrines.

Besides the usual (and almost necessary) eccentricity and oddness, there is quite an argument to make for mental problems—especially those of bipolar affective nature—among famous writers, artists and painters, such as van Gogh, Schumann, Hemingway, Poe, Nietzsche and Woolf, just to name a few. And, indeed, it is conceptually appealing to equate bouts of mania, feelings of extravagance and grandeur with hyper-creative periods. On the other hand, the depressive abyss can easily be reconciled with the notorious ‘Weltschmerz’. However, while it is trivial to assume that serenity uplifts creativity, what does the evidence say?

Is Creativity Linked With Mental Illness?

A huge study (>300,000 people) from Sweden looked at the likelihood of having a “creative” vocation (e.g. designers, but also university teachers—hurray for us!) in people who had been hospitalized for schizophrenia, bipolar disorder or unipolar depression [1]. Compared to patients’ healthy relatives, folks with bipolar disorder (and healthy siblings of people with a diagnosis of either bipolar disorder or schizophrenia) were strikingly over-represented in creative professions.

Interestingly, the researchers stumbled upon a similarly fascinating trail: they found that it was not the patients themselves, but their close relatives who were overrepresented in creative occupations. It could be speculated now that having a “flattened” share of psychopathology could be conducive to the creativity and artful talent, which is quite in line with the romantic notion of the tortured artist. And, indeed, evidence seems to back this “halfway” theory [3]. For instance, psychologically healthy relatives of patients suffering from schizophrenia were shown to be more inclined towards creative jobs and hobbies. At the same time, they also have higher levels of schizotypal or schizoid traits that are associated with schizophrenia. To make sense of it all, exactly those traits, the “unconventional modes of thinking and perceiving” [3], may be the driving force behind creativity.

This Is Your Brain On Creativity

Such “unconventional” mental operations have been linked with deactivation of the precuneus [4], a crucial node of the default mode network (DMN). The DMN seems to be support “mind wandering” and ruminating, which makes it interesting for the study of creativity. In one study, the ability to suppress precuneus activity was directly related to creativity in a cognitive task. Intriguingly, schizophrenics and their relatives suffering from schizophrenia were shown to be more inclined towards creative activities. To make sense of it all, exactly those traits, the “unconventional modes of thinking and perceiving” [3], may be the driving force behind creativity.

Neuroscience aside, the popular misconception of the artist as a troubled, existentially challenged and outright “mad” individual, a vessel tossed around by the storms of his condition, has remained un-debunked.

AUTHORS MORE LIKELY TO HAVE BIPOLAR DISORDER

Room For Divine Inspiration?


Helge Hasselmann
PhD Student, AG Otte
Das Wunder in der SchuhEinlegeSohle

The Miracle in the Shoe Insole

From November to April 2015, Berlin was home to an exhibition with the odd name “The Miracle in the Shoe Insole”. The title was borrowed from an artwork of a psychiatric inmate, showing faces he saw in the sweat marks on his insoles.

Around 1920 Dr. Hans Prinzhorn curated an art collection by inmates of psychiatric clinics on behalf of the University of Heidelberg. His book “Bildnerei der Geisteskranken” (Artistry of the Mentally Ill, 1922) got a lot of attention in the field of art. It quickly became a sort of bible for the surrealists and coined the term “Art Brut”.

The collection of everything from drawings to sculptures was created by unmedicated psychiatric inmates suffering from different mental illnesses. The works show the attempts at maintaining control over a world that has come apart at the seams. In these masterpieces, industrialization is newly interpreted, new world-orders created and encounters with death, sexual perversion or religiousness are processed.

Prinzhorn investigated the psychological roots of creativity and developed the theory on the need for expression in an effort to systematize the environment. He saw scribbles as the roots of creative production. In this context, there is a collection of confusing scribbling, textual columns, and cryptographs. Some inmates created certificates and paper money in an effort to exorcise the authority structures of the Wilhelminian period and the Prussian ideals that haunted them.

The parallels of these works to modern art are striking! The collection preempts the development of modern art in the 20th century such as surrealism, expressionism and even Pop Art. You will find serial art like Andy Warhol’s work and techniques also applied by Picasso-like using everyday objects to create art. Due to this resemblance, part of the collection was shown in the Nazi exhibition “entartete Kunst” (Degenerate Art) in 1938. The Nazis exploited the works of the mentally ill to imply that modern art is pathological.

This exhibition made me ask, “What is the origin of creativity? What is the difference between pathological illusion and art? What is the essence of modern art?” In fact, the exhibition itself gave an answer by citing Jean Dubuffet: “There is never an art of mental patients, as there never would be an art of stomach or knee patients.”

This exhibition will be shown next in Heidelberg until August 15th 2015.

The Art in the Smart

We asked you to unleash your inner artist and send us any brain-related images that you find particularly beautiful or eye-catching!
Focus

Is There a Method to This Madness?
A Look Into ‘Method Acting’ and Psychiatric Disorders in Films

What would make a physically healthy man spend months on end in a wheelchair, relying on his co-workers to feed him and lift him in and out of his chair? This is just one of the behaviors attributed to actor Daniel Day Lewis, perhaps the most famous of our time for his devotion to method acting. According to an article in The Independent, he spent a long time in a wheelchair in preparation for the film “My Left Foot” (1989), he learned to build canoes in preparation for “The Last of The Mohicans” (1992) and learned to speak Czech for “The Unbearable Lightness of Being” (1988) [1]. Perhaps as a consequence of this devotion, he has won three Oscars for his performances, and is famous for his ability to completely transform into a character [1].

The idea that an actor can and should immerse himself in a role is relatively new in the history of human acting. The authors of a recent article drew parallels between ancient acting along the lines of Greek tragedies – and its stereotyped exaggerated portrayal of emotions – and the type of play acting seen in children [2].

What is it that makes someone so good at assuming the appearance and character of someone else? Method acting as it is known today, comes from the “Stanislavski system” – a system of techniques for mastering acting originally pioneered by Constantin Stanislavski in the early 1900s, and later adapted and modified by numerous acting coaches [2]. To achieve realism, this school of acting required actors to draw upon their own experiences to reproduce the emotions of their character in the moment. If their character was feeling angry, they should focus on an experience that made them angry in their personal life; the same applies if their character was feeling sad [2]. As actress Deborah Margolin said in an interview for Atlantic Monthly, “My character would cry, and I would cry. She was miserable, and I was miserable. She was a frustrated, ignorant person trapped in a narrow life, and I felt like that.” Margolin described the lines blurring between her character’s reality and her own [3].

If the portrayal of the normal landscape of human experience can take its toll on an actor, one has to imagine the difficulties an actor might face portraying a mentally ill character in a realistic manner. Perhaps this is one of the reasons why the portrayal of psychiatric disorders in the media has in some ways lagged behind the realism of the rest of acting. While the rest of the characters in films have become more true to life, those who are struggling with mental illness are often confined to exaggerated, stereotyped roles. The portrayal of mental illness as a set of simplified negative stereotypes has long been a plot device used in films. In a paper from 1991, psychiatrist Dr. Steven Hyler and his colleagues identified several key stereotypes of the mentally ill that repeatedly appeared in films. One of the most egregious stereotypes they discuss is the “mentally ill patient as homicidal maniac”, for example in the movies “Psycho” (1960) or “Halloween” (1978) [4]. A more positive, but also misleading stereotype that appears in films is the mental patient as a misunderstood free spirit, such as Jack Nicholson’s character in “One Flew Over the Cuckoo’s Nest” (1975) [4]. This implies that there is nothing wrong with these patients that breaking free from a mental institution cannot fix [4]. Although this film does show patients in a more positive light, the take-home message that mental illness is not really an illness is potentially damaging.

In sharp contrast, films also portray mental illnesses as intimately linked with genius. In “A Beautiful Mind” (2001), “The Aviator” (2004), and “Shine” (1996) the protagonist is successful in spite of the significant challenges posed by a struggle with mental illness [5]. On the one hand these depictions are more positive – the character is able to overcome his or her disability and achieve great things. On the other hand, these movies also risk implying that only the truly exceptional can succeed while battling a psychiatric disorder [5]. While inspiring, these stories fail to portray people leading relatively normal lives in spite of their struggles with mental illness.

If the secret to realistic acting is indeed to draw upon feelings and experiences in one’s own life, then it may be impossible to portray mental illness in a realistic way. However, it seems that portraying characters with mental illness as having normal lives, as people who are not defined by their list of symptoms, would be a start towards a more helpful and healthy representation of mental illness in films.


Lauren Mamer
PhD Student, AG Rosenmund


Films Portray Illness as Intimately Linked with Genius

CNS Newsletter June 2015
Down the Rabbit Hole
The Influence of Drugs on Artists and Their Work

Since time immemorial, mankind has made accidental or intentional use of substances to alter consciousness. A crucial prerequisite for being an artist is ingenuity; therefore artists are usually at higher risk of falling into the allurement of exploding creativity.

Many artists have indeed “experienced” with different kinds of drugs that influenced their work. Probably the most popular examples of artists who used drugs are the ones who wrote several songs that openly refer to the artist’s drug experiences. A few examples are: the song “Rehab” by Amy Winehouse and “Because I got high” by Afroman. Excessive drug usage is often perceived as a common aspect of famous musicians’ work and lives since the 1960s (during the times of “Sex, Drugs and Rock’n’Roll”) [1]. Other songs deal with the topic less obviously, yet this can still be noticed if you analyze them more deeply, like in “Beetlebum” by Blur.

Misunderstood Works of Art

There are also other songs commonly believed to be about drug experiences, such as “Puff the Magic Dragon” by Peter, Paul and Mary or, probably the most popular one, “Lucy in the Sky with Diamonds” by The Beatles, which describes a psychedelic journey resembling Lysergic acid diethylamide (LSD) trips. In fact, it seems that one, “Lucy in the Sky with Diamonds”, was released a century before LSD hit the market, but the descriptions also fit the effects of consumption of psychedelic mushrooms, which were already well known in Victorian times. There is no real evidence of Carroll having had personal experience with hallucinogenic substances, yet people tend to over-interpret his texts [4].

Drugs in Literature, Painting, and Photography

Other pieces of literature are well known to have been influenced by their author’s drug experiences. American poet and short story pioneer Edgar Allan Poe’s personal experience with opium as well as alcoholism profoundly influenced his stories [5]. Charles Baudelaire, famous for his poems and essays, was a member of the ‘hashish club’, comprised of many fine arts luminaries of the nineteenth century.

During a cocaine binge, Scottish novelist Robert Lewis Stevenson, author of “Treasure Island”, managed to write the 60,000 words of “Strange Case of Dr Jekyll and Mr Hyde” in only six days. He shared his proclivity for cocaine with modern day horror author Stephen King [6]. In the case of Ken Kesey, drug abuse heavily influenced his “One Flew Over the Cuckoo’s Nest”, although one does not need to interpret the story as an acid trip to appreciate its beauty and disturbing nature [7]. Remarkably, even the great William Shakespeare was recently found to have used opium [8].

Of course, drug abuse among artists is not limited to musicians and writers. Vincent Van Gogh’s expressionist style and preference for yellow may have been influenced by visual disturbances caused by excessive ingestion of digitals and/or absinthe, a liquor distilled from wormwood plants containing the neurotoxin thujone [9]. An interesting art project conducted by American performance artist Bryan Lewis Saunders generated a series of self-portraits, each under the influence of a different drug [10].

Berlin-based photographer Sarah Schönfeld took an entirely different perspective. She did not create art by taking drugs, but exposed film negatives to them instead. As each drug crystalized differently, an amazing series of photographs was produced [11,12]. The use and abuse of drugs has influenced all fine arts and created memorable pieces. However, given the numerous cases of artists whose drug addictions lead to physical and mental illnesses, their use is clearly not desirable. For example, former Pink Floyd member Roger “Syd” Barrett suffered from LSD-induced mental illness. And many more eventually died as a result of their drug abuse.

MANY FAMOUS ARTISTS EXPERIMENTED WITH DRUGS


Source: http://bit.ly/1EQLX42

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From Performance Anxiety to Eustress

Everyone who has had to give a presentation knows the inevitable feeling of nervousness prior to their task. While we usually regard this as normal, there are people who are psychologically and physiologically suffering from this type of arousal, causing them to avoid such situations. The current Diagnostic and Statistical Manual of Mental Disorders describes ‘performance anxiety’ as a social anxiety disorder with features like persistent fear and avoidance (even when only anticipating performance situations), which may climax in panic attacks. For the diagnosis to be made, all of these symptoms must significantly interfere with normal living and persist for at least six months [1].

Given that musicians and actors make their living from performing frequently, their livelihood is especially threatened by this disorder. This often leads to unhealthy strategies to cope with the stress, including alcohol and drug abuse (see also “Down the Rabbit Hole” on page 11). Music performance anxiety (MPA) is a clinically relevant syndrome affecting musicians of any age, often leading to poor performance quality and an inability to enjoy the task [2]. Interestingly, there are differences between artists performing classical and popular music. Among classical musicians, the younger ones show higher levels of MPA, while popular music performers suffer from MPA at a later age [3].

Fortunately, there is hope. Besides the nervous feeling towards the upcoming task, the term ‘performance anxiety’ also covers a rather positive aspect: the so-called ‘eustress’. It is a positive cognitive response to the arousal that occurs prior to a performance situation, which boosts one’s concentration and accomplishment. In fact, in a recent study, researchers presented different recordings of the very same piano piece, recorded either with or without an audience. The listeners were asked to decide which sounded better. Listeners rated the recordings made in front of an audience higher, indicating that ‘eustress’ enhanced musical performance [4]. As you can see, you can always try to make good use of your nervousness!

EUSTRESS IS THE POSITIVE RESPONSE TO PERFORMANCE ANXIETY

https://bit.ly/1RfjJ9t

Let Your Imagination Go Wild!

“Imagination is more powerful than knowledge” were the words of the great physicist Albert Einstein. It is true in the sense that imagination opens up limitless possibilities to explore the whole universe inside your head. Isn’t that fascinating? We can travel to any place in the world, or play a movie or song or daydream with our mind’s ‘eye’ without actually perceiving this with our senses. How does imagination work? How did Shakespeare, Michelangelo or Mozart come up with brilliant works of art?

Researchers have suggested that our brains ‘imagine’ or come up with creative ideas by creating a ‘mental workspace’ [1]. This involves the distribution of information among different subdomains of the brain. While imagining new ideas, we are trying out different combinations in our ‘mental playground’. In an imaging study, participants were asked to look at abstract shapes and simultaneously imagine new shapes. The results showed activation in not only the visual cortex, but also prefrontal and parietal regions involved in selectivity of task relevance and the posterior precuneus, involved in conscious information processing.

CREATIVITY IS BORN IN A MENTAL PLAYGROUND

Imagination and Reality Flow in Opposite Directions

We all know how daydreaming feels — so vivid and real. But how is this different from perception? According to an EEG study, the flow of information during imagination is from the parietal to the occipital cortex, which is opposite to that of actual perception [2]. This means that flow is from higher-order brain regions, which integrate inputs from different senses, to lower-order regions.

Another interesting fact to ponder is that the occurrence of synesthesia—the perception of mixed sensations like seeing numbers or hearing colors—is more common in artists, poets, and musicians. It has been proposed that there are stronger connections between their brain regions for perception of different senses [3]. So tap in to your creative side by thinking differently ‘inside the box’!

[1] Schlegel et al., PNAS, 2013

Aarti Swaminathan
PhD Student, AG Schmitz

Bettina Schmerl
PhD Student, AG Shoichet

Source: http://markchadwick.deviantart.com/
The Secret of Beauty
Beauty Lies in the Eyes of the Beholder

The concept of “ideal beauty” has changed over time, based on a shift of cultural values. Beauty involves symmetry, harmony, and balance with nature and is associated with emotional well-being [1]. For example, women are widely acknowledged most beautiful when they are relatively young, with smooth skin and well-proportioned bodies (a waist-to-hip ratio of approximately 0.70) [2].

Ideal Meets Reality
Surprisingly, scientists have found that “ideal beauty” can be found in “averageness” [2]. When averaging images of human faces to form a composite image, they are perceived as more attractive. In contrast, cultural values and the media influence “real beauty”. For example, in ancient China, women with small feet were considered more beautiful. Girls bound their feet tightly to inhibit their growth and appear attractive. Contemporary western media has extended this ideal of “slimness” to the whole body, often featuring very slender women and promoting eating disorders as a side effect.

An ideal beauty arrived in reality—Nefertiti. Her name means “a beautiful woman has arrived”. Nefertiti, regarded a legendary queen of beauty, has been honored not only for her beautiful face, but also her kindness and wisdom. The definition of beauty is not only based on external features (i.e. facial and physical attractiveness), but also the inner beauty (i.e. personality, intelligence, grace, and charisma). Even cloaked in ugliness, we humans tend to prefer inner beauty to outward appearances [1].

The Value of Beauty
Beauty cannot be understood without ugliness. To be ugly is to deviate highly from “ideal beauty”. Ishizu and Zeki (2011) formulated a brain-based theory for this duality: our brain may have at least two different judgment systems for experiences involving beauty and ugliness [3]: The experience of beauty engaged the medial orbito-frontal cortex, an area containing the centers of desire, pleasure, reward, and value judgments in the brain. The experience of ugliness was confined to the amygdala and the motor cortex [3]. Gotshalk said that “beauty is a value”, that it evokes desire and that whatever is desired has value [4]. This implies an intimate link between beauty, value, and desire in cortical processing.

What is Beautiful?
Our judgments of beauty are not arbitrary, but are slanted towards highly phenotypical and genetic quality to enhance survival and reproductive success [5]. A healthy, fertile mate offers considerable benefits over an unhealthy, infertile one in evolutionary terms. One example is that of mens’ preference for women with high reproductive value (young and healthy) [6]. Thus, perceptions of beauty are likely evolutionarily determined by a “mate-quality hypothesis” [5].

Perceptual biases and associative learning also regulate beauty preferences [7]. Face recognition is not innate, though the ability to develop this skill is. Infants can discriminate between individual monkeys and human faces at 6 months, but not at 9 months without continued learning [7].

Given the same input (i.e. the existence of men, women, variation in age and features), we might expect to find generally similar preferences across cultures [8]. This can be tempered by associative learning of local conditions (age-specific fertility). Ghirlanda et al. (2002) showed that chickens share some of the same beauty standards as humans and that they prefer beautiful humans [9]. This result seems to speak against the mate-quality hypothesis, which suggests that preferences are species-specific. It might, however, be that similar preferences could develop by learning.

Show, Do Not Tell
Beauty seems to be about many obvious, but also subtle things and it might well be that beauty is not about anything except itself. If someone wanted to make sense out of beauty, it would kill what is great about it. But those who accept beauty on its own terms will find it a fascinating experience. Samuel Clemens said, “Don’t tell us that the old lady screamed. Bring her on and let her scream.” Through interactive action instead of passive reception, it enables individuals to have their own experiences, interpret it in a way that they understand and lets them draw their own conclusions. Regardless of the complexity of beauty, its simple secret lies in the fact that you feel that you and someone (or something) can understand each other even without explicit communication.

References:
[1] Umberto Eco, History of Beauty, 2004

Shuyan Liu
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Music and the Rhythmic Brain

Music is universal and has no boundaries. But why has music evolved when there seems to be no real purpose for it like survival or reproduction? Researchers believe that music is important to human evolution in various ways: by helping babies to learn a language, aiding in the transfer of knowledge or history over generations and social bonding. Music is much more complex than just sound – it is organized, melodious and rhythmic.

Physics of Music
Music comprises fundamental elements such as pitch, tempo, timbre, key and intensity. Being a singer, I was interested in knowing the differences in the structure of distinct kinds of music and how our brains perceive them. Doing some reading, I found out that there are two major musical tunings: ‘just intonation’ and ‘equal temperament’.

Western classical and most modern music are based on a 12-tone equal temperament system. In this musical tuning, 12 equal intervals divide the octave, with the same frequency ratio between adjacent notes. Just intonation is a musical tuning in which the octave consists of seven frequency notes which are members of harmonic series and are related by ratios of whole numbers. Indian classical music, bagpipes and barbershop quartets are based on the just intonation system [1].

Perception of Music
Have you ever wondered what is going on in your brain while you are listening to Beethoven’s 9th symphony? How are you able to disentangle the complex sounds of different instruments? And why do you feel this indescribable bliss while listening to music? How exactly do our brains process music?

Processing of music activates different prefrontal, temporal and cerebellar brain regions. Music or sound are represented in the brain by neighboring regions [2]. During the perception of music, multiple sounds are processed simultaneously. The auditory system forms links between the sounds based on the fundamentals such as pitch, timing, harmony as well as the spatial location of the sound [3]. In addition, processing lyrics requires the brain’s language centers.

Melody and Rhythm Processing
Studies implicate the secondary auditory cortex in melody processing, which involves comparing an anomaly or out-of-tune pitch in a melody with previous music knowledge [4]. On the other hand, the motor areas, parietal cortex, frontal cortex and cerebellum are involved in rhythm processing. A study has shown that the electrical activity in the brain occurs in phase with the beats of the rhythm [5]. An intriguing aspect of music processing is the activation of the visual cortex. Research shows that music evokes visual imagery in the listener’s mind according to the variation in the music [6].

Listening to music also activates the pleasure center in the brain (nucleus accumbens), which evokes the strong “blissful, intoxicating” feeling [7]. In Indian classical music, a ‘raga’, or series of four or more notes (in harmonic series), is known to evoke specific emotions inside the mind of the listener [8]. Our brains are also constantly predicting upcoming sequences in a song based on patterns and beats, creating a sense of anticipation. But scientists have found out that some aspect of surprise or uncertainty in music also increases its aesthetic beauty [9]!

Music production requires complex motor control movements such as timing (as in rhythm), sequencing and spatial organization of motor movements (as in playing the notes on musical instruments). This involves various brain regions such as the primary motor cortex and the supplementary motor area, cerebellum, and basal ganglia [10]. An interesting study showed that, while playing a duet, brain waves become synchronized between the two guitarists [11]. Music indeed has an immense power on our minds that transcends our understanding!

Aarti Swaminathan
PhD Student, AG Schmitz


[5] Snyder and Large, Brain Res Cogn Brain Res, 2005
The Artful Algorithm
Machine-Made Music to Alter Your Mood

‘Electronic music’ might take on a completely new meaning with the advent of Algorithmic Composition. Daniel Pitman has developed the Affective Algorithmic Composer (AACr), a computer program that can compose original music with specific emotional content, as part of his Masters at the University of Adelaide. I had a few questions for him about his work in composing a composer.

JK: What is the “Affective Algorithmic Composer”? What is it intended to do?
DP: The Affective Algorithmic Composer (AACr) generates music that is designed to affect its audience in a certain way. It does this by playing heaps of music to people, measuring all the ways they react using biosensors, electroencephalogram, and surveys, and then using all this data to train neural networks. The neural networks then slowly develop the gist of the relationship between certain musical structures, like scale or tempo, and how these features affect people. The result is a system that can make you happy, frustrated, sweaty, or engaged, using automatically generated music.

Are the compositions entirely original, or does it mix and blend existing pieces?
It’s all generated by a broad spectrum algorithm that can have any scale, any rhythm, any melody. It only plays piano at the moment, a convenient limitation for developing, but I can see other instruments getting involved down the track. It can do everything at the cost of not being good at any one thing. It would take billions of planets of human populations’ lifetimes to listen to every possible combination of structural variables. That’s why we need an AI critic!

Would you say that the AACr is ‘creative’?
I’d say it’s more like filtration to find a music passage that suits the job.

Is that so different?
Well, the algorithm itself never changes and is technically unexciting, and the neural networks need a target state or a context in order to be useful. It isn’t intended to mimic humans, but it is apparent that we have no other inspiration in AI than our own intelligence.

How effective is the Affective Algorithmic Composer? Have you tested the pieces on people to see whether they elicit the expected responses?
It holds up pretty well based on some of the training data we reserved to test it. This is, of course, using data from the same people who trained the machine, so it isn’t a really good indicator of success. Any group, or even the same group on a different day, would have given different results, so I think we have to treat the program as an individual in a way. It has its own experiences to draw on, and given a specific goal, provides what it thinks is best based on that experience. The point of the program is that we capture a group’s reactions and use them to navigate through the vast number of possible combinations of musical structures in a relative instant.

But listening to it is the best way to discern if it works or not.

Can we hear some of the music that AACr has made?
Some straightforward demonstrations are already online. I’ll put a heap more up soon, including a generated soundtrack for the old silent film by Fritz Lang “Metropolis”. It’s been really fun putting that together. I’m hoping that one of those little indie block based procedural games will consider having a procedural soundtrack to boot. You know, sunset, boss fights, victories, spooky tension - all these things can have a target mood, and systems like AACr can compose for that in real-time and without supervision.

What gave you this idea?
I’ve actually been working on this idea since undergrad, when I wrote a simple algorithm to imitate Phillip Glass. I called it THE GLASSINATOR - and it was pretty OK. But I realized I could expand this algorithm to do a lot of other things, anything really, and the number of things it could do became outrageous! Billions of planets worth of populations of music listening. So now, I had this huge search space of potential music, but I had to figure out how to navigate it and find the best stuff. I realized only humans actually experience music as a biological phenomenon. So if only humans can tell the difference between sounds that sound like music and actual music with context and ineffable expression and all that human stuff, I need to tap into that. For honors, I bought a little EEG headset. Next thing you know I’m working with AI and inventing ‘musical Skynet’. Honestly didn’t see that coming.

The Glassinator sounds like it was already on the path towards Skynet. Do you get criticism from people about this type of work or do they mostly find it exciting?
My supervisor did actually express some concern that my work might be confiscated by ASIO or the CIA for torturing people. Luckily, it hasn’t reached that level. You can already lock people in a room with Bieber for twenty minutes, so my work has no value as a weapon yet. AI, as an emerging technology, will happen, whether we like it or not. Mooly Eden from Intel said computers will have human levels of processing power by 2026. That’s like tomorrow! We should be a little more trusting in what scientists are optimistic about rather than what Hollywood is sensationalist about.

To be honest, I would be somewhat gratified if the CIA did confiscate it. Unfortunately, there’s still a way to go before these types of systems are applicable to real life tasks, even nice ones like musical therapy or gaming.

Thank, you Daniel.

You can listen to some examples of the Affective Algorithmic Composer at: https://soundcloud.com/danpitman

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From Magnetic to Vocal Resonance

Real-time MRI Finds Use Beyond Diagnostic Imaging

When I’m browsing through YouTube, it’s usually because I’m trying to get away from the chaos of life as a PhD student. So when a thumbnail pops up showing a magnetic resonance imaging (MRI) scan of the human brain, I could be forgiven for turning a blind eye and continuing my search for videos of cats nonchalantly pushing things off tables. This time, for some reason, my inner neuroscientist, whom I try to keep at bay during my free time, clicked on the link.

The Recording Studio of the Future?

MRI is mostly used to take still images, either to show the structure of organs and tissues or to assess their function. However, a new type of MRI scan has recently gained popularity. Using this technology, the movement of any body part can be filmed in real-time. So far, it has been used to monitor surgical procedures, assess heart function, and find out what makes the ‘popping’ sound when we crack our knuckles. In the music industry, the method has also found uses that are more creative. The link took me to a music video called ‘Better Man Than He’ by the artist Sivu. The entire video was shot inside an MRI scanner and you can clearly and smoothly see the movement of the singer’s tongue, mouth, palate and larynx throughout the scan [1]. Incredibly, detailed MR images can now be taken at a rate of 50 per second [2]. The last film you watched at the cinema was probably projected at half that frequency.

Watch Me Clear My Throat

Not satisfied with simply singing, scientists have already begun probing the limits of our sound-making abilities using this technique. The art of vocally imitating musical instruments such as drums and trumpets (beatboxing) baffled many as hip-hop-loving teenagers in the ’90s. Researchers using real-time MRI have found that sound production during beatboxing is achieved using phonetic patterns that don’t exist in the artist’s native language [3]. The subject in their study spoke English and Spanish, but was able to articulate sounds that are typical of languages spoken in Botswana, Namibia, and Chechnya to make percussion sounds. The artist Rahzel is famous for being able to beatbox and sing at the same time [4]. How does that work? We’d have to get him into an MR scanner to find out.


Ahmed Khalil
PhD Student, AG Fiebach

Can Music Make Me Smarter?

Music lessons improve verbal memory

In 1993, a study published that listening to Mozart produced an increase in spatial reasoning skills [1], a phenomenon dubbed The Mozart Effect. It sparked heavy debates in the society about the relationship between classical music listening, education, and intelligence. The hype dampened after scientists failed to show that music has a sustainable increase in general IQ. Unfortunately exposure to Mozart’s music does not raise the IQ, but maybe learning to play an instrument does?

Music performance relies on action-perception-loops calling for focused attention on visual, auditory and motor signals. Can this training of high-level cognitive skills in children who learn to play an instrument enhance their performance in domains outside music? Indeed organized music lessons appear to benefit children’s IQ and academic performance; and the longer the instruction continues, the larger the effect [2]. Musicians also show greater word memory [3]. Thus it is no longer a question of whether musical training is associated with higher cognitive abilities. How is Music Education Linked to IQ?

Children with higher IQ have the cognitive ability to handle the challenges of music lessons. Learning to read and perform music might lead to improved intellectual functioning and exaggerate the advantage of a higher IQ [2].

Another theory is that musical training enhances verbal memory processing due to neuro-anatomical changes in the left temporal lobe. Magnetic resonance imaging has shown that the left temporal area is larger in musicians than non-musicians [3]. Music training in childhood may therefore have long-term positive effects on verbal memory. Musicians also have more developed anterior portions of the corpus callosum (fibers that join the hemispheres) than non-musicians [4]. An increase in size suggests a greater merging between the spatial-emotion-tonal processing of the right brain and the linguistic processing of the left brain. This large relaying across different brain areas might contribute to music’s ability to aid in memory function.

So learn music and boost your IQ!


Claudia Bentz
PhD Student, AG Eickholt

Ahmed Khalil
PhD Student, AG Fiebach

FOCUS
Taste that Bass

Synesthesia and Creativity

“For every color, there is a sound, a vibration, a part of the human body, a number, a musical note. [...] It’s my only reference for understanding. [...] And if it was taken from me suddenly I’m not sure that I could make music. [...] I wouldn’t have a measure to understand.” - Pharrell Williams [1]

Regardless of what colors Pharrell might have been seeing as he composed “Am I High”, the perceived link between synesthesia and artistic creativity goes back some time. But despite Mr. William’s claim, the jury is still out on whether such a connection actually exists, and if it does, why.

It seems to be true that synesthetes are more likely to be professional artists. One study found a synesthesia prevalence of 24% in artistic professions, compared to a general prevalence of 2% [2]. But correlation does not mean causation, and an explanation for this relationship could be motivation rather than inherent creativity. Since synesthetes are endowed with a richer sensory experience when engaging in their artistic disciplines, they may be inclined to spend longer practicing them than their non-synesthete counterparts. In the long run, this could increase the likelihood of performing in a professional sphere.

A later study focused on whether there might be a higher inherent creative capacity of synesthetes. They found that synesthetes did not have higher scores for creativity overall, but that they did score higher on a specific cryptic word task, called the Remote Associates Test [3]. This task asks you to find the common word that can be associated with a list of other words; for example, if given the 3 words ‘snow’, ‘base’, and ‘dance’, you would be required to find the linking fourth word, in this case ‘ball’. Obviously, this requires some associative thinking, but whether it has a direct relationship to creativity is questionable.

So the link between synesthesia and art may lie through motivation rather than raw creativity, but any definitive claim about the relationship is still controversial. Whatever the case, we can look forward to the high proportion of synesthete artists continuing to release such visionary classics as “Come Get It Bae” and “Hot-n-Fun”.

SYNESTHESIA AND ART
LINKED THROUGH MOTIVATION


The Art of Scent

Have you ever thought of scent as an artistic medium? Recently, the Museum Tinguely in Basel displayed the exhibition “Belle Haleine” which tried to capture the artistic side of smell [1].

Like any form of art, the creation of a fragrance is the result of experimentation and innovation. Yet perfume is rarely appreciated as art. Like music, it is an invisible art form. But unlike music, it can’t be digitized and promoted on the Web. Training in chemistry is needed to reproduce a certain scent.

Odor perception is directly linked with the limbic system. Therefore, smell is closely associated with memories and emotions. The judgment of odor quality is highly context-dependent, changing and shifting depending on molecular, biological, emotional, and social contexts.

Furthermore, there are few words available to describe scents. The challenge to identify a fragrance often lies in the lack of vocabulary rather than a lack of olfactory receptors or neural pathways. To help overcome this dilemma, Sissel Tolaas from the Re_Search Lab created a special alphabet—the “Nasalo” [2]. She also runs a smell archive here in Berlin, which consists of thousands of distinctive smells from all over the world preserved in little cans.


Source: Claudia Bentz

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James Kerr
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Source: Claudia Bentz
The Dancing Brain

Neural Correlates of Dance

Dancing is most definitely my favorite form of art. It is actually one of the few forms that can be placed in both the categories of arts and sports (maybe we should start calling it a ‘sport’!). Dancing beautifully integrates complex motor learning and memory, rhythmic musical synchronization, and creative emotional expression. As a neuroscientist and a dancer, I feel compelled to summarize here the links between these two fascinating fields and some interesting features of the dancing brain.

Dance Performance
Not surprisingly, the brain areas that are activated during dancing are mostly the ones involved in the planning and execution of movements (motor cortex and basal ganglia), in receiving feedback from the muscles (somatosensory cortex), and in the fine tuning and coordination of movements (cerebellum) [1].

Brown and colleagues looked more deeply into which brain areas are activated by particular aspects of dancing. They placed amateur tango dancers in a positron emission tomography scanner while performing leg movements on a designed apparatus. The putamen (part of the basal ganglia) was strongly activated only when the subject danced to regular, metric music, but not to an irregular rhythm. The cerebellum was implicated in matching dance steps to music and the superior parietal lobule was engaged in spatial guidance of leg motions [2]. These findings suggest that different areas of the central nervous system are responsible for the control of specific and distinct tasks in dancing.

Dance Observation
Other neuroimaging studies observed the brain’s response to visual observation of dance. Dancers trained in either ballet or capoeira (a Brazilian martial art) and non-dancers watched videos of both these styles while their brains were scanned. All subjects showed activation of brain areas involved in action observation and simulation networks - the “mirror neuron system”.

However, activation of these areas was stronger in dance experts and even stronger when the dancers saw movements they had been trained to perform, compared to watching movements they were unfamiliar with. There was no difference in the brain activity of non-dancers while watching ballet or capoeira [3]. This shows that even passive observation of dance activates movement areas in the brain as if you were moving yourself, and that dancers have an enhanced neural representation of their personal motor repertoire.

With Practice Comes Adaptation
An interesting study showed that the brain of ballet dancers adapts to prevent them from feeling dizzy. Brain scans revealed that the vestibular cerebellum, an area responsible for the perception of dizziness, is smaller in dancers compared to non-dancers [4]. This demonstrates that even the vestibular response is sensitive to training. Also, skilled dancers depend less on vision for postural control compared to non-dancers. Instead, they rely on their highly accurate proprioception - the sense of awareness of body parts’ positions in space [5].

Professional dancers are also trained with motor techniques to perform highly demanding moves in apparently effortless ways. An electromyography study showed that, when performing swinging leg movements, skilled ballet dancers selectively applied minimal muscle tension at the very same position where the sway force was maximal. This means that they learn to optimize motor function and consequently reduce energy costs in terms of force and muscle contraction [6].

Benefits of Dancing
Several studies have observed better balance, posture, proprioception, and cardio-respiratory resistance in dancers compared to non-dancers. But don’t think you would have to become a professional to profit from these benefits. Even short episodes of breakdance training increase balance skills in young amateurs [7]. Dance practice has the potential to improve not only motor, but also cognitive skills. An impressive 21-year study showed that frequent dancing is highly protective against dementias, such as Alzheimer’s disease, lowering the risk as much as 76%! It was also found to be much more beneficial than doing crossword puzzles (47% reduced risk), reading (35%) or swimming or bicycling (0% - no difference at all) [8].

Neuroplasticity is likely responsible for this effect. When we dance, we enrich our brain, making split-second decisions and creating new synapses and neural paths that become especially valuable as we age.

Dancing is not only physically demanding, it is cognitively demanding as well. So when you dance, you are exercising both your body and your brain. Regular dance training makes you improve innumerable motor and cognitive skills, contributes to brain plasticity, and enhances social interaction. And, all health benefits aside, dancing is simply fun! How much better can it possibly get?


Mariana Cerdeira
PhD Student, AG Harms
It Takes Two To Tango
Dancing and Parkinson’s Disease

Patients with Parkinson’s disease (PD) often display postural instability, gait difficulties, falling episodes and reduced functional mobility leading to decreased quality of life. As pharmacological methods are only partially effective in addressing these problems, there is a clear need for additional, non-pharmacological approaches to address balance and gait difficulties [1]. Exercise is an effective therapy to complement the traditional pharmacologic treatments. Dancing is a form of exercise that can challenge gait and balance impairments, with the possibility to socialize (see also ‘The Dancing Brain’ on p. 16). For some, it is more enjoyable than traditional physical activity, promoting adherence and motivation to exercise [2].

Argentine tango is a partner dance that was found to be particularly effective in PD, resulting in larger improvements in balance, mobility, movement initiation and attention to movement control compared to other forms of dance (such as waltz and foxtrot) [3,4]. Tango offers both physical and cognitive challenges as it incorporates low level aerobic activity with gait and balance training (backward walking, dynamic balance, postural control, movement initiation/termination).

This requires high-level multitasking and progressive motor skill learning in the presence of external cues provided by the music and the partner. Tango’s benefits may extend beyond physical improvements to stimulate broader participation in life activities for those with PD. Higher depression, anxiety and stress levels associated with PD are reduced with tango, but not the other dance styles analyzed [4]. Decreased availability of dopamine transporter in the anterior putamen correlates with depressive symptoms and anxiety, but rhythmic tango steps have been shown to selectively activate the putamen [2].

Tango, with demonstrated efficacy, should be pursued as a potential means for improving PD motor and cognitive symptoms and possibly slowing disease progression. Let’s Tango!

Within the Charité a group of Tango for PD patients is also being planned. For more information please contact Dr. Ana Luisa Pina.
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TANGO BENEFITS BOTH MIND AND BODY


The Art in the Smart

“Hidden Mickey in Confocal Microscopy” by Mariana Cerdeira (PhD Student, AG Harms)
Interview with Emilie Marcus
Editor-in-Chief of CELL

Emilie Marcus is the Editor-in-Chief of the prestigious journal Cell. While visiting the Charité in March she gave the CNS Newsletter an exclusive interview.

CB: What path did you take to become a journal editor?
EM: I started as a standard graduate school–postdoc. I did my graduate studies at Yale in Neuroscience studying learning and memory with Aplysia californica. I went on with my postdoc at the Salk Institute. I had always assumed I would have my own lab. Towards the end of my postdoc I started to apply for faculty jobs. I had no experience in editing. What I had was a very broad interest in science – I knew a little about a lot of things. I would read all the abstracts of Cell, Science, Nature or Neuron every time they came out. I knew what was going on in the field even though it had nothing to do with my work. That was often frustrating to my postdoc advisor: that I wasn’t focusing. It turns out that this is not a strength in academia, but a fantastic skill to have as an editor. Talking to people about their science, understanding what is interesting, hearing about all kinds of different scientific problems and assessing how interesting they are... For the editorial job I have, that was sort of the key skill.

How did you get your first job as an editor?
EM: I directly applied to Neuron. I saw an ad and applied for the interview. At that time Neuron was one of the four journals of Cell Press. The founder of the company, Benjamin Lewin, was a very colorful character but very intimidating as well. When I showed up for the interview he handed me the most recent issue of Neuron – you know it is slightly thicker than this Charité Neuroscience Newsletter. We sat in his office and he said, “read the first mini-review and tell me what you think about it: Should we have published it? Is it interesting?”. And I said, “do you want me to read this, with you sitting there?”. He said, “yes, I will be at the computer working, just read it and tell me what you think!”. So I read through it and we had a 10 minute discussion about it and then he said OK, read the next one. And for the rest of that day we read every paper in Neuron: structure papers, circuit papers, molecular papers... It was incredibly intimidating. And I could not read that fast! (laughing) Nor did I feel I could have opinions on such a broad range of science. But I also found that I just loved it! It was a great day.

What do journals look for when recruiting editors?
EM: For the kind of job I have, the basic skill is being able to quickly grasp new concepts and having something to contribute to them. My editorial job is more about evaluating science than writing. There are other jobs in editing where writing is much more important, for example the trans-journals (a set of review-journals). Here, the focus is more on communicating an idea so writing is much more of a skill set. People always talk about professional editors and editing. But the word “editing” means so many different things. The skills you have and what you like doing are important to match the type of editing you want to do.

Being an editor is quite a position of power – you ultimately decide the fate of manuscripts. Do you sometimes question the choices you made after accepting or declining a manuscript?
EM: Certainly I am well aware of the responsibility. I don’t typically think of it as power. What I think most, is that first of all I have to do the best job that I can – the most diligent, respectful, faithful and consistent job that I can do. We are always seeking feedback and advice. It is not a single decision, neither mine nor even the whole editorial team, but we are out talking to scientists all the time and adapting our view of where things are going. In one sentence: yes, I certainly feel the responsibility, and occasionally ques-

“MY EDITORIAL JOB IS MORE ABOUT EVALUATING SCIENCE THAN WRITING.”
Chip. They know I am going to make science. That is one of the advantages of a subscription journal model, right? X amount of money, that is equally probable. I think the journal proper to publishing as a diversity of models. Some journals work better with a subscription model and some journals work better with an open-access model. In the end someones has to pay and the question is: is it the readers or the authors? Cell itself is a highly selective journal; it treats a lot more papers than it publishes. That means in order for it to be sustainable, the fee for an author would have to be quite high. If you can only publish in Cell if you have $X amount of money, that is equally problematic to me as paying for the access to readership. I don’t think that the ability to publish in a journal that gets visibility should be based on how much money you have. As an author you should have the freedom to publish in the best journal, and essentially, for free. That is why I am happy to have these two models coexist and that we have a home for open access within Cell press. But we can’t yet see a way to make a journal like Cell economically sustainable in the current open access market.

One last question: for both self-editing and editing other people's work, can you give us any tips for improving the CNS Newsletter? EM: From what I can see you are already doing an extremely good job. How I think about it for my own writing and what I question authors to do is to trick yourself into reading a piece as a reader, not as a writer. Write it, step away, and come back. This is a very hard mindset but really helps, because in the end our work should attract someone who does not have any of the background you have. The context is so important in understanding things. And as a writer, you have this entire context and see your writing very differently compared to a reader. Think about who your audience is, whom you want to reach. Sometimes I will literally just put the manuscript aside and come back the next day and I don’t allow myself any highlighting. I just read it. Take a cup of coffee and read it! Because that is how the readers are going to read it. And ask: can you get the main message? Can you go away and say, “I get it.”? That is what I want to give you as advice as to editing your work.

Thank you for this interview!

Claudia Bentz
PhD Student, AG Eickholt

www.medical-neurosciences.de
Life As A Game

The Situation Is Hopeless, But Not Serious

Alan Watts used to say “Life is a game where Rule No. 1 is: this is no game, this is serious”. In this game of life, we seek to maximize gratification whilst minimizing punishment. Life is hence seen as largely being about dealing with these conflicts. This can be troublesome, for it requires a great deal of effort, and yet even the most intense effort may still fail. The talented unhappiness expert knows of this danger well.

The talented unhappiness expert

How good are people at being unhappy in their life? Paul Watzlawick gives us some of his thoughts in his book “The Pursuit of Unhappiness” [1]. He observes that the number of us talented enough to create our own hell seems to be large. A way to start with being unhappy is to make a to-do list. Make it huge to list seven or more items, especially if you are most likely able to complete three of them. This will leave you unhappy. If that is not enough, make a list with all the items that you potentially could do (but never come around to). Frustration will flow naturally from dealing with too many upcoming items!

If this state of things seems hopeless - it is - if you are bound to take it seriously. Because you see, you could just not take it seriously, but decide to engage it with humor. Humor isn't just about being funny. Humor is also about how liberating it can be to meet adversity not only with deep, ruminating thoughts but also with a loud laugh. Life, if played as a game, should be engaged with curiosity and acceptance, rather than with fear and resistance.

Zhuāngzī sings upon his wife's death

A well-known Chinese story “Zhuāngzī's Wife dies” describes Zhuāngzī banging the drum and singing upon his wife's death [2]. Zhuāngzī explains, “When she died, I was in despair. But I then looked back and I saw that in the beginning, all of us have no life, no form and no spirit. We are all blended in one great featureless indistinguishable mass. A time came when that mass brought forth spirit, spirit brought forth form and form brought forth life. And now life in its turn has brought forth death. So life and death are a natural cycle, like the four seasons. If I violated her peaceful rest with sobbing and bawling, it would show that I knew little and less of nature's laws. So, I stop mourning”. Zhuāngzī seems to have viewed death as a natural process or transformation, wherein one gives up one form of existence and assumes another. He promoted carefree wandering and becoming one with “The Way” (Dào) by following nature.

Perhaps the greatest happiness of all, could be achieved through a higher understanding of the nature of things, and that in order to develop oneself fully one needs to express one's innate ability. Death makes us sad but does not need to stop us from moving on with our life and achieve happiness.

Zero- and non-zero-sum theory

The “hopeless” may stem from believing or expecting to gain happiness or anything else at the expense of another, what is called a “zero-sum game” in both economic and game theory [3]. A person's success comes at the expense of another person's failure because of the belief that there is a very limited and finite amount of resources to be had. A classic example is “special interests” in which one institutes campaigns for a bigger slice of the resource pie. That gain comes at the expense of all the other institutes receiving less.

The “not serious” is that the resolving of such impossible and illogical situations is hopelessly simple, what is called a “zero-sum game” in a “win-win” format [3]. In Watzlawick's view [1], zero-sum games are inherently unworkable and “hopeless” for the collective whole, while non-zero-sum games simply are “not serious”, given they are designed to work for everyone, even when the situation appears to be a no-win situation, commonly describe as “Damned if you do, damned if you don’t.” As a very simple example, I have a field producing an excess of almonds and you have a field producing an excess of apples. We both benefit by engaging in a trade.

More of the same

We often seem to be like prisoners of well-established hyperrationality in the game of life. Freud noted that we have a strong drive to repeat things even though they are harmful to us [4]. This behavior may be a part of several disorders, in particular addiction and obsessive-compulsive disorders. Perhaps repetition is due to life (Eros) and death (Thanatos) drives that are only partially satisfied and an attempt to fulfill all needs. Or maybe, when an action fails to fully satisfy, the resulting frustration and indignity increases tension to the point where we seek the nearest potential gratification, which is to attempt the act again.

Finally, we laugh while we still have teeth

Every game has an end. But in life, every ending is just a new beginning. “There are two tragedies in life: one is not to get your heart's desire and the other is to get it”, said Oscar Wilde. It would appear that the game’s creator has made an unattained goal seem much more desirable and ecstatic than it turns out to be, when we reach it. We cannot plan everything. That is what makes life interesting and worthwhile. It can be tough and dangerous, but if we could have and cherish the ability to laugh, we would have the chance to enjoy it. The situation is hopeless but the solution is hopelessly simple.

“Smoking Paradox” Stirs Controversy in Stroke Community

A recent study conducted at the Charité re-awakened a hot topic of controversy first described nearly 20 years ago, termed “the smoking paradox” in which smokers respond better to treatment following ischemic cardiovascular events [1].

Smoking is a well-known risk factor for atherosclerosis, myocardial infarction (MI; heart attack) and ischemic stroke. Therefore, it is understandable why the community was unsettled by results published in an observational study in 1995 describing lower mortality rates in smokers with MI following treatment [2].

MI and ischemic stroke are caused by an obstruction of a blood vessel due to a thrombus, or clot clot. The diminished blood flow distal to the occluded vessel causes the downstream tissue to die due to ischemia. The main treatment of these ischemic events is either mechanical removal of the clot clot or lysis of the clot via systemic thrombolysis.

Following the first study reporting the smoking-paradox in 1995, several studies followed showing similar results. However, a critical review of these studies put a quick end to the discussion; this review attributed the observed better outcome in smokers to their younger age and to insufficient statistical power [3]. Subsequently, the once-hot topic of the smoking paradox fell silent for several years until a recent Charité study stirred up the discussion again with robust results.

In the neuroimaging study at the Charité, smokers with ischemic stroke showed a 6-fold greater chance of revascularization (opening of the occluded artery in response to thrombolysis; see figure) and a trend towards a better recovery compared to non-smokers [1].

Before the study was even accepted for publication, researchers at the Charité got wind of the results and began questioning the findings. Not until an external statistician reviewed the data did the study get the permission to proceed with re-submission.

Once accepted for publication in Stroke, the critiques began with similar arguments against the studies in the 90s, namely that statistical power was lacking. It is difficult to argue against these criticisms with one retrospective study. However, it wasn’t long before four further studies followed supporting the theory: smokers respond better to treatment than non-smokers. Although these findings may appear paradoxical at first, there is a feasible scientific explanation.

Experimental animal studies show that smoking decreases the amount of endogenous tissue-plasminogen-activator (tPA) released from endothelial cells [4]; tPA is a protein involved in the breakdown of fibrin, which causes blood to clot. Higher fibrin levels in smokers compared to non-smokers [5] may cause higher risk for thrombus formation. Therefore, the clots formed in smokers may have a higher fibrin content compared to non-smokers, making them more susceptible to be lysed by exogenous tPA treatment (i.e. thrombolysis).

In light of this possible explanation, the term “smoking paradox” rings quite true. On the one hand, smokers have a higher chance of having a stroke in the first place, but on the other hand have a greater chance of responding to treatment. So, how does this help us in the clinical setting?

Thrombolysis with tPA is not risk-free: approximately 6% of patients suffer an intracerebral hemorrhage. Furthermore, only a small percentage of patients with ischemic stroke arrive to the clinic within the therapeutic time-window of 4.5 hours. Nonetheless, off-label treatment with tPA in tricky cases is quite common. If we know smokers are more likely to respond to treatment, we might have an indication for thrombolysis in potentially difficult cases (i.e. elderly patients, patients arriving in later time-windows).

As of yet, there are only small studies on this topic and results remain controversial. However, recently two large multicenter studies have been launched in order to further investigate the smoking paradox phenomenon, each including >6,000 patients. Hopefully, these studies will unveil the true “smoking effect” and answer the dozens of unanswered questions regarding how we can apply this knowledge in the clinical setting.

Does Money Make You Mean?

A TED Talk by Dr. Paul Piff

Money can’t buy happiness. Time and again, we have heard this saying go around. In his TED talk, Dr. Paul Piff talks about his research on how social hierarchy and inequality shape our relationships. He goes on to show how having too much money actually makes people behave unpleasantly.

Through a series of studies in his talk, he provides compelling evidence for how with increasing wealth, feelings of empathy and compassion go down, while feelings of entitlement and an ideology of self-interest increase. He starts off with an example of a rigged game of monopoly, where one player could collect twice as much money as the other. These rich players displayed dominant behavior characteristics, for example, by moving their pieces loudly around the board and even talked about how they won because of their “strategy”! They thus completely failed to see that the game was rigged and tried to rationalize their advantage by convincing themselves they deserved it.

In another study, he showed that rich people (or rather, people in more expensive cars) were less likely to stop for pedestrians at a crossing, i.e. they were more likely to break the law. None of the people from the least expensive car category broke the law.

After sharing several such results on the negative behavior of the wealthy, his talk however concludes on a positive note. He provides evidence that the wealthier, or the upper class, can be just as egalitarian as the less wealthy by reminding them of the benefits of cooperation or the advantages of community. By making people watch a brief video on childhood poverty and then studying how likely they were to help out a person in need, they found that the rich were just as likely to help this stranger out as a poor person. This proves that these differences are certainly not innate but are actually very malleable to changes in people’s values.

Dr. Piff ends his talk on social inequality with a fitting quote from Bill Gates who says, “Humanity’s greatest advances are not in its discoveries, but in how those discoveries are applied to reduce inequity”.

Watch the talk: www.bit.ly/1lNoHKC

Apoorva Rajiv Madipakkam
PhD Student, AG Sterzer

Neuroscience in Your Everyday Life

Why Is It Again that Scratching an Itch Makes It Itchier?

We have all experienced that feeling of relief when we reach to scratch an itch. Then just as we stop and think it has finally gone we see our hands going back to that dreadful area again. Fingers now point to serotonin as the culprit for making that itch itchier. Itch was thought to be a form of mild pain until itch-specific neurons closely related to the pain neurons were discovered in mice in 2009 [1].

The receptors of itch-sensing neurons can either facilitate pain relief or induce itch. Activating one pathway suppresses the other and this explains why scratching momentarily blocks the itch [2]. Scratching also releases the neurotransmitter serotonin, which helps alleviate pain. This burst of serotonin is what makes the scratching feel good. But, this relief is short-lived as the same molecule aggravates the itch-scratch cycle too. [3]. Although serotonin can only bind to the pain relief receptor, because the itch-inducing receptor sits so close to it, it indirectly enhances the itch pathway.

Mice with both receptors activated, scratched more than if only the itch-inducing receptor was turned on alone. While mice that did not produce serotonin, scratched less than normal mice when exposed to a skin irritant [3].

Although such itch-specific neurons are yet to be discovered in humans, it makes sense to think twice before you reach for that itch!

Do you also sometimes wonder about the simple neuroscientific questions in everyday life, but don’t really feel like looking them up right away? For questions like this, just mail us your question (cns-newsletter@charite.de) and Dr. Harebrained will give us his explanation in the next issue! Our next issues question: Why is it again that we forget?

[3] Zhao ZQ et al., Neuron, 2014

Apoorva Rajiv Madipakkam
PhD Student, AG Sterzer
**Over the Counter Pain Killers May Dull Emotions**

Paracetamol (Acetominophen) is a common pain killer typically used for mild pain and headaches. A recent randomized controlled trial at Ohio State University showed that people who had been administered 1000 mg of the drug responded with less emotion to both positive and negative emotionally provocative images. These participants were 20% less likely to rate an image as extremely pleasant and 10% less likely to rate an image as extremely unpleasant, as compared to participants given a placebo. Researchers have speculated that this emotionally blunting effect is due to the action of this drug at the Insula, a region of the brain known to be involved in social emotional response.

Bakalar, Nicholas: Tylenol May Blunt Emotions, and Not Just Pain. 20 April 2015. http://nyti.ms/1F8GVmG

**Thinking May Support Brain Tumor Growth**

The growth of certain types of brain tumors may be fueled by active cognitive processes. Stanford scientist Dr. Michelle Monje recently discovered in mice with high-grade glioma tumors, local action potentials increased tumor growth. In addition, tumors near highly active neurons tended to grow quicker than those in inactive zones. These local action potentials typically provoke myelination, a phenomenon which typically increases the rate of neuron firing, but may also support a tumor’s ability to manipulate its own growth and microenvironment. Although pharmacologically reducing these action potentials may reduce the rate of tumor growth, Monje states that this is not a viable therapeutic option because ‘we don’t want to stop people with brain tumors from thinking or learning or being active.’ This research suggests a new pathway to target tumor growth, but how this information can be best applied remains unseen.


**Primate Research Controversy Continues**

A director at the Max Planck Institute for Biological Cybernetics, Nikos Logothetis, has recently stated that he will end his career in primate research. This statement comes after years of criticism from animal rights groups of the primate research center where Logothetis works in Tübingen, Germany, as well as Logothetis’ own macaque research. Logothetis’ primate subjects were documented after a neural implantation surgery by an undercover animal rights activist, footage which was broadcast on German national television this past September. Logothetis has cited threatening personal attacks by activist groups as well as lukewarm support from his colleagues and the greater scientific community as his reasoning behind this decision.

In parallel to this controversy in Germany, Stony Brook University in the US has been forced to defend its custody of two chimps, Hercules and Leo. Hercules’ and Leo’s legal representatives, hired by the Nonhuman Rights Groups organization, claim that Stony Brook has unlawful detained the chimps. This court hearing brings up the debate of whether or not caged chimpanzees should be considered as ‘legal persons’ according to US law. A technology lawyer, Bob Kohn, who opposes this view and has participated in similar cases, stated that a decision in favor of primates being considered as legal persons would “have tremendous adverse legal and moral implications for mankind.” The debate continues as the court date is underway this week.


McKinley, Jesse: Judge Orders Stony Brook University to Defend Its Custody of 2 Chimps. 21 April 2015. http://nyti.ms/1zPurya

**Sickness May Leave You with a Bitter Taste**

A study published on April 21st in Brain, Behavior, and Immunity has shown that certain molecules that trigger an inflammatory response may effect the increase the taste perception of bitterness. The authors of the paper are researchers at the Monell Chemical Senses Center in the US, where they are investigating the connection between weight-loss during illness and taste perception. They found that one particular pro-inflammatory molecule, TNF-α, which been shown to be increased in individuals with an activated immune response in comparison with healthy individuals, may play a role in taste. This study illustrated that when TNF-α is knocked-out in mice, these mice have a reduced ability to detect bitterness while having a normal ability to detect other taste percepts. Further research is needed to expand these findings.

MSc and PhD Thesis Awards

Donald B. Lindsley Prize in Behavioral Neuroscience
Your outstanding PhD thesis in behavioral neuroscience (neuroscience research involving behavioral variables or oriented toward the solution of behavioral problems) can be awarded with the Donald B. Lindsley Prize in Behavioral Neuroscience at the annual SfN meeting. Your thesis has to have been submitted and approved between January 1 and December 31 of the preceding calendar year. You can win $2,500 and further benefits for the SfN meeting (accommodation, etc.). Deadline for application: June 03, 2014. Further information: http://bit.ly/XRjCme

Nemko Prize in Cellular or Molecular Neuroscience
Your outstanding PhD thesis in cellular or molecular neuroscience (neuroscience research involving behavioral variables or oriented toward the solution of behavioral problems) can be awarded with the Nemko Prize in Cellular or Molecular Neuroscience at the annual SfN meeting. Your thesis has to have been submitted and approved between January 1 and December 31 of the preceding calendar year. You can win $2,500 and further benefits for the SfN meeting (accommodation, etc.). Deadline for application: June 03, 2014. Further information: http://bit.ly/WFawIn

DGPPN-Promotionspreis - Hans-Heimann Preis
Your outstanding PhD thesis in psychiatry or psychotherapy can be awarded with the DGPPN-Promotionspreis - Hans-Heimann Preis. The PhD thesis has to have been finished within the last two years with magna or summa cum laude. Application is done together with your supervisor. The total of €8,000 is split into €5,000 for you and €3,000 for your supervisor. Deadline for application: June 30, 2015. Further information: http://www.dgppn.de/ehrungen-preise/dgppn-preise.html

The Humboldt Prize of Humboldt-Universität zu Berlin
You can apply again for the Humboldt Prize, which is awarded for the best thesis completed as part of the following degree programs:
- Bachelor’s Degree - €750
- Master’s Degree, Magister, Diploma, State Exams - €1,500
- Doctoral Degree - €3,000
The work must have been completed after the application deadline of the previous year (July 1, 2014) and must have been graded with a “summa cum laude”, sehr gut (1.5) or an “A”. Deadline for application: July 01, 2015. Further information: https://www.hu-berlin.de/forschung/services/info_foerderung/humboldt-preis

A Literal Case of Cultural Overload

Did you know that sometimes a new culture could be so hard to handle you could actually suffer from a transient psychological disorder? Paris syndrome is one such disorder encountered by some individuals (usually Japanese tourists) while vacationing in Paris or elsewhere in Europe [1]. Victims report psychiatric symptoms like delusions, hallucinations, anxiety, dizziness etc. Stendhal syndrome is a similar psychosomatic disorder experienced by individuals when exposed to an experience of great personal significance, for example, viewing art [2]. The weird syndromes do not stop here! Jerusalem syndrome is another that can be added to this list [3]. But I will let you read about it yourself or maybe even experience it if you ever visit the city!


Leave A Trace

This cool installation at the Charite Cross Over (CCO) on Virchowweg 6, records your movements with a camera and transforms it to a visible line on a screen. The intensity of the lines vary depending on when they were made, with newer tracks being more intensive. These time-dependent differences in color generate a spatial pattern that changes throughout the day. At midnight, the screen is reset and the last version on the screen is stored as the picture of the day. Visit the CCO to draw your own traces and check out “Leave A Trace” by Tyyne Claudia Pollmann (http://leave-a-trace.charite.de/leave_a_trace/abstract/) to learn more about the software and the installation.

Source: http://bit.ly/1bDKGT6
25 New Master Students to Join the Program
With another March behind us, we are happy to announce that we admitted the top 15 candidates. Like last year, only two students are from Germany. Out of more than 350 applications, we had narrowed down the final shortlist to 50 candidates. We are already excited and look forward to the start of the semester in October. Additionally, five first-year Neurasmus students and five second-year students will join our program.

Neurasmus Students to Meet in Amsterdam
From July 7–10, Amsterdam will host this year’s annual Neurasmus meeting. Besides board meetings and a scientific program including presentations of Master theses, the Neurasmus students in Amsterdam and Neurasmus Alumni have organized activities including a soft skills and a career workshop. This year, the meeting will also include the graduation ceremony of the third cohort of students as well as the orientation week for the new students. Congratulations and welcome from Berlin! The 2014 Neurasmus students will leave Berlin for Amsterdam, Bordeaux, or Coimbra. We wish them all the best for their second year.

Mariana and Ahmed to Represent the PhD Program
Our PhD students voted; we are happy to announce that Mariana Cerdeira and Ahmed Khalil are the new representatives of the Medical Neurosciences PhD program. Mariana and Ahmed are both NeuroCure fellows and are very dedicated to the program. Furthermore, both were Neurasmus Master students. While Ahmed spent most of his time in Berlin, with a visit to Bordeaux, Mariana spent most of her time in Göttingen at the International Max Planck Research School for Neuroscience, with one semester abroad also in Bordeaux. We are looking forward to ‘gear-up’ the program with them.

PhD Program to Be Adapted
With the new representatives - Mariana and Ahmed-, as well as other dedicated students, the program office is about to rebuild the PhD program. Julia Rummel, a new member of our office team, will lead this process together with PhD students. Julia offered a Design Thinking workshop to kick-start this process. The results are still being evaluated. From the office’s point of view the workshop was a success. We identified the strengths and weaknesses of the PhD program and are happy to implement as many changes as possible to improve the program.

June

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<td>3rd Annual Discovery Chemistry &amp; Drug Design Congress</td>
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<td>40th Congress of The Federation of the European Biochemical Societies</td>
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<td>60th Annual Meeting of the German Society for Neuropathology and Neuroanatomy (DGNN)</td>
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