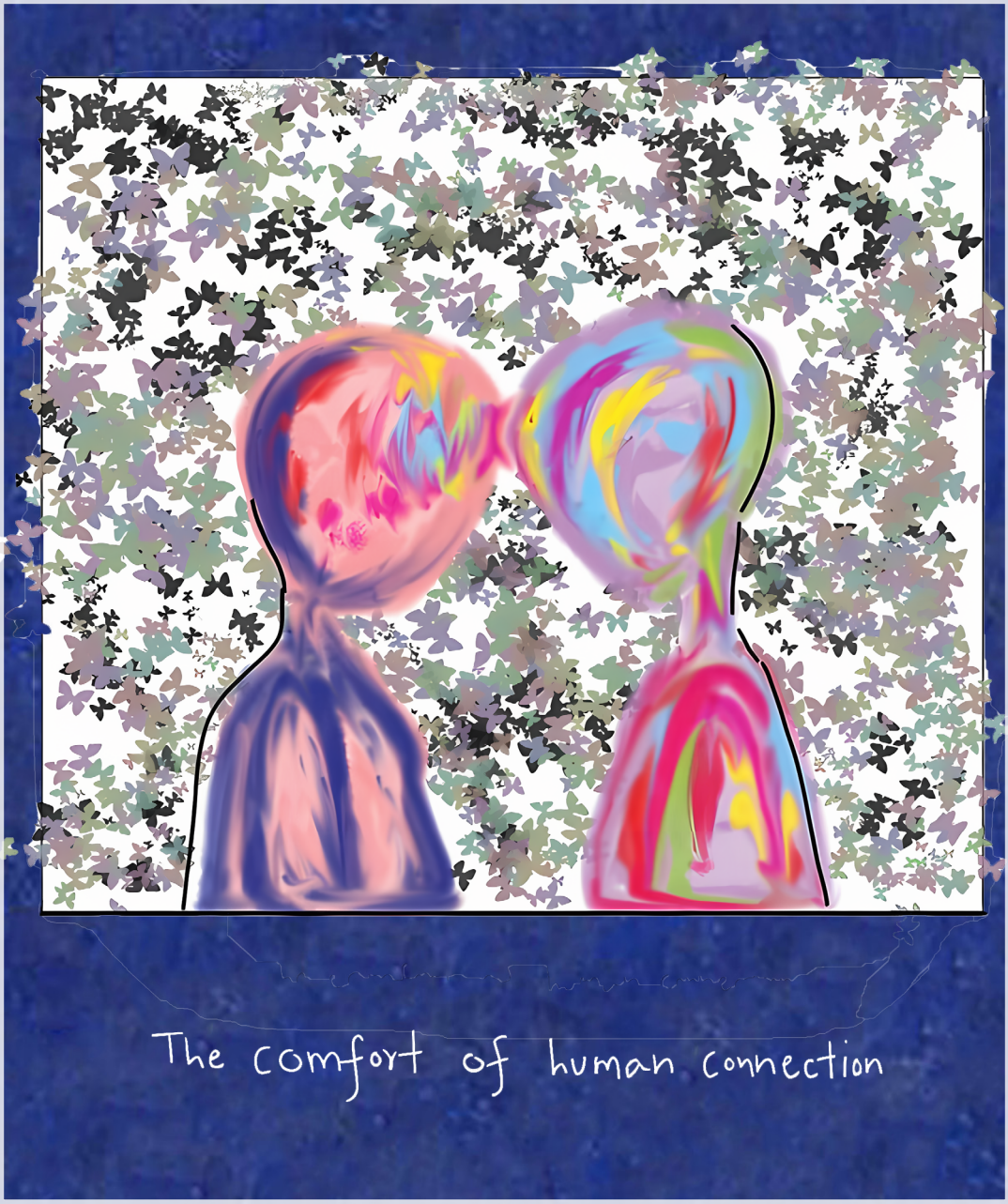
# mRNA



The comfort of human connection

YEAR 9 // ISSUE 2 // MAY 2024

HISTORY OF LOVE // ORTHOGRAPHIC DEATH // STORYTELLING // TORTURED ARTISTS // CONSPIRACY // LANGUAGE VS. THINKING // SEMANTIC CHANGE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## COLOPHON

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# EDITORIAL

## AGRIMA MATHUR

Dearest mRNA readers,

I'm delighted to welcome you to this scintillating edition of mRNA, where we bask in the warmth of Human Connection.

As the warm weather makes its reappearance, and the cotton candy clouds in the blue sky sweep the seasonal depression away, the time for beach trips and evening strolls is upon us.

I found myself truly able to appreciate the tranquillity that comes with this warmer weather during the beunweekend for this edition. During the painstaking hour of 5 am, the mRNA team woke up to carry out the beloved tradition of the "Zwethscursion". Amidst the sleepiness of the group, we watched as the sun rose above the horizon a golden hue over the stillness of the field, the morning dew still dripping from the tall grass. I was reminded why the Zwethscursion is an integral part of the writing process. The air filled with laughter and carefree chatter, the theme of human connection was unfolding before my eyes.

And so, as the weather brightens, so do our hearts, these articles remind us to cherish the complexities of the human mind.

Have you ever wondered how language has the power to shape our way of thinking? Or perhaps the history behind the love stories that make our hearts reminisce of a midsummer night's dream? We'll dive into the enrapturing world of conspiracies, then explore the enigmatic lives of tortured artists.

So grab a cold drink, find a sunny spot, and delve into our brand new edition of mRNA.

At your service,

Agrima Mathur

Editor-in-Chief of mRNA 8.5

# FROM THE BOARD

## FREKE DE MUNK

Dear reader,

The days are longer than the nights, warm days are getting more normal and the summer holiday is approaching. The end of the academic year also means the end of our board year, which feels quite surreal. It's been such a special year full of memorable moments and lovely people.

These last few weeks mean that we're rounding up our last projects, evaluating our year and preparing for our last few activities. We'll still have our barbeque after the last exams, our study trip to the British Isles and the first year's weekend to welcome our new students. In addition, the 11th potential board has been announced and they're thoroughly preparing their year: writing a pre-policy, dividing committees, getting trained by us and getting to know each other as well as all the other upcoming boards.

As the year is coming to an end, we're doing our best to look back on everything this year has meant for us. For me personally, I immediately think of all the nice people I met and got to know better within our association but also all other study association boards we regularly see. All those people putting in time and work to (voluntarily) organize and participate in activities while working closely together in the process. I think this is what it's all about in the end: human connection. I'm so grateful for the warm and safe feeling that Hooke has always given me, even when I was still a shy and introverted first-year student. I hope we've been able to continue that spirit during our year of running the association.

Before I close off my very last piece for this magazine as president, I would like to express my gratitude towards the committee members of mRNA: you keep surprising me with your creativity, writing and InDesign skills. You can be proud of what you produced and I'm sure a lot of members enjoy reading your work.

Then lastly, I want to wish all of you a lovely and well-deserved summer holiday where you can unwind, have fun and enjoy some nice weather and above all, experience a lot of warm and valuable human connection.

I have spoken,

Freke de Munk
President of S.V.N.B. Hooke 2023-2024

# NANOCARRIERS: A MEANS TO IMPROVE DRUG DELIVERY

## NANONEWS I

**Humans have long found ways to overcome different types of barriers. From physical barriers, like ravaging rivers; to language barriers, preventing communication across different nationalities; all of which, eventually became conquered through ingenuity, and human advancements. While we may be facing more trivial obstacles on the macroscale (e.g. the universal lack of will to wash the dishes, which appears to be shared amongst students), what if I told you that on a much smaller scale a new way to surmount obstacles has come to life by a piece of human technology, the size of a mere few nanometers. These tiny nano-warriors built to overcome various yet dangerous biological barriers, are known as nanocarriers as they have the ability to act as a targeted drug delivery system.**

Targeted drug delivery systems (TDDS) have the unique ability to enhance the effectiveness and reduce unwanted side effects of drugs. They operate through various techniques and mechanisms that generally increase the solubility of drugs and their retention in specific locations. One such mechanism, known as the "Enhanced Permeability and Retention" or EPR effect, is the concept that larger particles tend to more likely accumulate in tumour tissue due to inefficient lymphatic drainage. This results in a higher concentration of the needed drug in tumour cells as opposed to non-tumour cells. The targeted delivery also reduces the risk of side effects by being engineered to release the drug in a more controlled manner. Nanocarriers have the ability to encapsulate hydrophobic substances, increasing the solubility of the drugs, effectively increasing their bioavailability.

- **Organic Nanocarriers:**

There are several types of organic nanocarriers such as polymeric nanocarriers consisting of dendrimers, micelles and nanoparticles. The advantage when it comes to using organic substances as a nanocarrier is their biocompatibility meaning they are less likely to induce a negative response from the human immune system. Another example of an organic nanocarrier would be liposomes. These consist of spontaneously self-assembled lipid bilayers, or artificial vesicles, which aid in encapsulating hydrophobic drugs.

- **Inorganic Nanocarriers:**

There are also inorganic nanocarriers such as mesoporous silica nanoparticles as well as metal nanoparticles, such as gold or iron oxide. The thermal, magnetic, and optical properties make inorganic nanoparticles particularly appealing when it comes to designing a nanocarrier as they can function by targeting stimuli responsive functional groups as well as ligands.

Despite the advantages previously presented, there are still many obstacles to overcome before seeing more commercial use of nanocarriers; in order to be an effective and accessible drug delivery system, the scale in which they are currently being produced must increase significantly.

Sources:
https://bit.ly/3wSEZkr
https://bit.ly/3VlQkmt

Image Sources:
Pexel.com

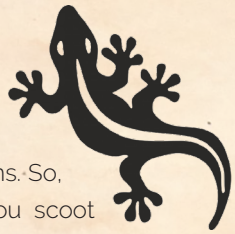
# HOW LANGUAGE SHAPES THE WAY WE THINK

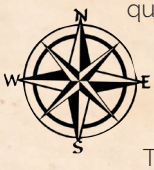
## HOW WE COMMUNICATE

**Did you know that there are about 7,000 languages spoken around the world? That's about 7,000 ways to communicate and arguably, 7,000 different ways to think. But how much does language actually shape our reality? According to Holy Roman emperor Charlemagne, it completely crafts it; as he once said, "to have a second language is to have a second soul." And today, research led by cognitive scientist Lera Boroditsky gives scientific data to weigh in on this question.**


If I ask you where northwest is right now, do you know? Most of you probably don't. In fact, you probably believe, as we have long been inclined to think, that humans are simply biologically worse than other creatures at staying oriented because they don't have an integrated magnet. But, what if I told you that this is actually a cultural phenomenon?

One great example of this is in an Aboriginal community living at the northernmost tip of Australia: the Kuuk Thaayorre people. In their language, instead of using words like 'left' and 'right', they use cardinal signs. So, instead of saying, 'Hey, can you scoot over to the left a bit?' you might say, 'Could you move a bit more southwest?' In fact, in Kuuk Thaayorre, the way to say hello is by asking, 'Which way are you going?' to which you would reply with something like 'North-northeast in the far distance. How about you?' So, imagine how quickly you would get oriented if you could not even get past saying hello without knowing which way you are facing. The Kuuk Thaayorre people are inherently oriented in space basically all the time just because of their language; it's second nature to them.







Such orientation also leads to big differences in how people think about time. If given photos of different stages of life, from baby to elderly, and told to arrange them chronologically, an English speaker might lay them out from left to right, while an Arabic speaker might lay them down from right to left. This has to do with writing direction. As for the Kuuk Thaayorre speaker, they will lay it down from right to left when facing

north, and from left to right if facing south. To them, time is locked in the landscape, moving from east to west.

We then notice that to the Kuuk Thaayorre, since location is not relative to them, their entire view of the world changes: they exist *in* it rather than it revolving around them.

Another fun example is the division of the colour spectrum. In English, 'blue' covers all the shades of blue, and we differentiate them by saying 'light' blue or 'dark' blue. On the contrary, in Russian, there are two completely different words for light blue and dark blue. When tested on their ability to perceive a difference between two shades of blue, the Russian speaker is much faster than the English speaker. Even when looking at their brains in an MRI as they watch a shade of blue shift from light to dark, there is a lot more activity in the Russian speaker's brain, as they notice a categorical change, than in the English speaker's brain, who sees nothing surprising happening.

Furthermore, as languages also change how people process events, they affect what one pays attention to. If someone accidentally breaks a glass, in English, they might say, "I broke the glass," while in a language like Spanish, one is more likely to say that "the glass broke". This has consequences in witnessing crimes, for example, where two people watching the same event might remember different things about it. English speakers are more likely to remember who did it since their language requires them to attribute the action to a subject, while Spanish speakers are less likely to remember who did it if it was an accident—instead, they will remember the intention. As such, language guides our reasoning about events.

There are countless examples as to how language shapes our reality, emotions, sociocultural views, reasoning, and more. Coming back to our initial question, we can now safely say that there are *at least* 7,000 different ways to shape our reality, and learning new languages is not just enabling communication with others—it's also unlocking a whole new way of thinking.

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# A ROMP THROUGH THE HISTORY OF LOVE STORIES

## ROMANCE

**Love. Ah, that four-letter word that has confounded scholars, poets, and philosophers for centuries. It's a topic that has fueled countless stories, from the epic tragedies of Shakespeare to the swoon-worthy rom-coms of today. So, grab your popcorn and prepare for a rollercoaster ride through the tumultuous history of love stories!**

Let's start with the ancient Greeks, those toga-wearing trendsetters. They gave us some of the earliest tales of love, like the epic saga of Helen of Troy and the face that launched a thousand ships. Talk about pressure! But hey, if your face starts wars, you must be doing something right. And who could forget the tragic tale of Pyramus and Thisbe, the original star-crossed lovers whose story inspired Shakespeare's Romeo and Juliet? Note to self: never try to communicate through a crack in the wall – it never ends well.

Fast forward to mediaeval times, where chivalry was in the air and knights were slaying dragons for a chance at love. Enter the Arthurian legends, where King Arthur, Guinevere, and Sir Lancelot formed the original love triangle. It's like a soap opera, but with more swords and chainmail. And let's not overlook the troubadours, those wandering minstrels who serenaded damsels from afar. Nothing says "I love you" like a ballad sung from beneath a lady's balcony – just watch out for falling flowerpots.

The Renaissance brought the masterpieces of Shakespeare, who penned the most iconic love stories of all time. From the romance of Cleopatra and Antony to the twisted tale of Othello, Shakespeare had a knack for capturing the complexities of the human heart.

As we journey into the 19th century, we encounter the romanticism movement, where love took centre stage in art, literature, and philosophy. Jane Austen gave us swoon-worthy romances like Pride and Prejudice and Sense and Sensibility, where love triumphs over social conventions and stuffy British manners. And who could forget the brooding bad boy of literature, Mr. Heathcliff from Emily Brontë's Wuthering Heights? He's like the original Edward Cullen, but with more angst and less sparkly skin.

However, it wasn't all sunshine and roses in the world of love stories. The 20th century brought us tales of heartache and disillusionment, like F. Scott Fitzgerald's The Great Gatsby, where love is as elusive as the green light at the end of Daisy's dock. And then there's Ernest Hemingway, the king of understated romance, whose characters often find love in the most unexpected places – like a smoky Parisian café or a bullfighting ring in Spain. Which brings us to the present day, where love stories come in all shapes and sizes. From the heartwarming rom-coms of Nora Ephron to the steamy pages of E.L. James's Fifty Shades of Grey, there's something for everyone in the world of modern romance.

What can we learn from the history of love stories? Well, for starters, love is messy, complicated, and downright unpredictable. But whether it's a tale of star-crossed lovers or a steamy romance novel, one thing's for sure: love will always be the greatest story ever told. So, here's to love – may we find it, lose it, and write epic poems about it for centuries to come.

Image Sources: Michael Logsdon Historical Illustrations

# THEORY OF STORYTELLING
## BREAKING DOWN LITERATURE

**From ancient myths etched onto cave walls to modern flashy blockbuster films, the art of storytelling has transcended time, cultures and mediums, creating a vast yet deeply intricate tapestry. There exists a theory, proposed by English journalist Christopher Booker in 2004, that suggests only seven fundamental plots are needed to weave together and produce the infinite sea of stories seen throughout history.**

The seven plots consist of the following:
*The Quest:* A harrowing tale of an unlikely crew with the aim to complete an all-important goal. From Frodo's quest to destroy the one ring, to the *Odyssey*, this plot is a means to quench the thirst of exploration.

*Rags to Riches:* With its timeless allure, introduces a protagonist who gains respect and power by overcoming adversity. From *Cinderella* to *Slumdog Millionaire*, this plot has captivated audiences for aeons, offering hope in even the bleakest of times.

*Overcoming the monster:* The ultimate tale of triumph, Beowulf's epic battles and Luke Skywalker's confrontation with the empire are just some examples of the constant battle between innate good and evil.

*Voyage and Return:* This plot consists of the protagonist venturing to a strange and foreign land, outside of their comfort zone, the most fitting example being *Alice in Wonderland*.

*Comedy:* Miscommunications, mistaken identities and every other word that starts with mis all string together to form a plot full of laughter, offering a short relief from the adversity of life. Shakespeare is undoubtedly one of the great users and perfectors of this plot.

*Tragedy:* Painful and soul-twisting, these narratives offer a protagonist plagued by their own misery and mistakes taken a step further by the evil hands of fate. These stories, such as *Hamlet* or *Anna Karenina*, often highlight the fragility and suffering of human existence.

*Rebirth:* The plot consists of an intensely emotional character arc showing the human capacity for change and redemption. The flawed change for the better, the Beast turns into a man, the Grinch's heart grows and spiritual rebirth takes place.

These seven archetypal plots contain the framework that only becomes visible when boiling down stories to their basic essence. From this very finite framework storytellers have created infinite narratives, each uniquely captivating. While when originally published, Booker's theory received some negative feedback, with people stating it is too limiting and dismisses stories that do not fit into the archetypes, recognising these universal patterns shows that human experience transcends time and culture.

Whether it's the comedic misadventures of a series of misunderstandings or the profound spiritual rebirth of a questionable and flawed anti-hero, each of the seven plots strikes a chord within the heart of humanity, resonating with our shared human experiences and emotions for centuries.

Sources: https://www.autocrit.com/7-stories-world/

# ZUCK MUCKERBURG: THE TRUTH BEHIND THE LIZARD

## CONSPIRACIES

**The Lizard Man** @hissssssss
8.57 PM 18/05/2024W

**Everything they teach you in school is a lie! You want the truth? The world is controlled by shadowy elites and shape-shifting lizard people. As much as they try to keep it hidden, once you start looking for the signs, there is no going back. It's the Gospel Truth they don't want you to know! These reptiles have been hiding among us from the very beginning. Just from a quick glance at the bible alone: kind of convenient how it was an intelligent serpent, capable of communication with humans, who tricked Eve into eating the apple, and how the devil, described as an ancient serpent who leads the whole world astray, symbolises powerful evil and chaos. From the beginning until the end, these creatures have been roaming amongst us, intermingling with us, and disguising their true nature, but NO LONGER! THE TRUTH WILL COME FORTH SO WE MAY RID THE SURFACE OF THE EARTH OF THESE ALIENS, AND REGAIN OUR FREEDOM!**

**The Lizard Man** @hissssssss
replying to @hissssssss

(2/6) Would be kind of crazy if people actually believed this, right? From believing in these reptilian tribes living underground, to the faking of the moon landing, and the CIA giving people LSD (oh nevermind, that actually happened)? The internet is filled with an immense amount of conspiracy theories, people wanting to unravel the unseen connections and unmask the most powerful. But why is the truth so hard to believe sometimes?

**The Lizard Man** @hissssssss

(3/6) Humans got to where they are today due to a number of biological advantages we were granted through evolution. One of these advantages is our innate, heightened ability to perceive patterns. It has allowed us to avoid danger: lions eat humans ergo don't go near lions. This also aided our skills in acquiring resources and food, from identifying edible plants to tracking the migration patterns of prey. But somewhere along the way, we might have allowed our pattern detection to become too good, resulting in illusory pattern perception, our tendency to see patterns that aren't there. When faced with random sequences, our minds naturally seek out order and structure, even when there are none, so the information becomes easier to process. When trying to memorise a bunch of digits from pi, for example, the random sequences get split into patterns to stop them feeling random and ease their processing.

**The Lizard Man** @hissssssss

(4/6) A 2017 study applied these ideas to conspiracy theories. The researchers conducted 5 experiments with 200-400 participants in each. In one experiment, people who saw

patterns in a random series of coin flips were more likely to believe in an irrational experimenter-designed conspiracy theory. In another experiment, they were asked to evaluate modern art paintings that were considered either "structured" or "chaotic." Those who saw patterns in the "structured" paintings (patterns designed to be there) didn't show signs of being more likely to believe in conspiracy theories, while people who saw non-existent patterns in the "chaotic" ones did.

**The Lizard Man** @hisssssss

(5/6) So, illusory pattern perception might be the reason why people believe in conspiracy theories, but why do they do it in the first place? Maybe it is just the fact that we don't like uncertainty. Studies have shown repeatedly that we are more comfortable with events that are predictable and controllable. Researchers believe people use conspiracies to make sense of complex events that don't seem to have a satisfactory explanation. If something is too hard to process, you look for other explanations. Especially in times of crisis, when people feel a loss of control over their lives and surroundings, conspiracy theories can conveniently help by assigning blame so they can regain a sense of agency and empowerment. Whether it is blaming vaccines for a global pandemic or government weather manipulation for natural disasters, the possibilities are endless!

**The Lizard Man** @hisssssss

(6/6) Now, do mind the dangers of conspiracies: from spreading misinformation to perpetuating harmful stereotypes, they can also erode trust in institutions and undermine the solidarity of communities. So remember to tread carefully the next time you spend late nights on Reddit. While conspiracy theories might offer an intriguing escape from reality, a little scepticism goes a long way. After all, the truth may be stranger than fiction, but it is worth seeking out amidst a sea of conspiracy.

**The Lizard Man** @hisssssss

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Add another Tweet

# SURVIVAL OF THE LEAST DESIRABLE

## EVOLUTION

**Evolution is kind of amazing isn't it? Producing animals as fast as cheetahs or as strong as hippos, survival of the fittest has led to such a great variety of species, all strong in their own right. And somehow, sloths, koalas, pandas, and so many other "inefficients" keep on living. These animals who keep defying all the odds, disregarding everything that Darwin worked so hard on, keep clinging to their existence despite their seemingly lack of evolutionary ambition. I have to applaud them but also I must ask, how??**

Consider sloths, so chill and laid back, as if they're smoking all the leaves that they're hanging around in. With their drowsy movements and relaxed demeanor, they could very well be the posterboys for lethargy. Although this makes them truly iconic, their behavior is actually deliberate and protects them from predators. By moving so slow, they have evolved to use as little energy as possible, causing their body to not develop much muscle mass. Sloths' muscles make up on average only 25-50% of their total body weight, whereas most mammals are 40-45% muscle mass. Sloths are still alive because it's simply not worth the hassle for most predators to hunt sloths – so most don't.

Similarly vibing, there's pandas. Imagine if the only thing you could/would/needed to do is chill in the forest, with your insatiable appetite for bamboo. As perplexing as it is that a species of bears has become vegetarian, it becomes easy to forget they are still actually bears. Being as territorial and viscous as black bears in the wild, pandas will not hesitate to sharpen their claws if you would be stupid enough to threaten them. Usually they don't have to though, and are just so relaxed they do not even want to mate. In a world where survival often hinges on adaptability and resourcefulness, pandas seem content enough with snacking their way through life, oh so blissfully unaware of the possibilities that come from evolution.

So why do these seemingly inefficient creatures continue to defy the odds and hang on to existence? Perhaps it's nature's way of injecting a bit of irony into the evolutionary process, a reminder that survival isn't always reserved for the strongest or the fastest. Or maybe, in a world that seems to move faster with each passing day, these animals serve as a much-needed reminder to slow down, relax, and enjoy the simple pleasures of life, like a little bite of bamboo.

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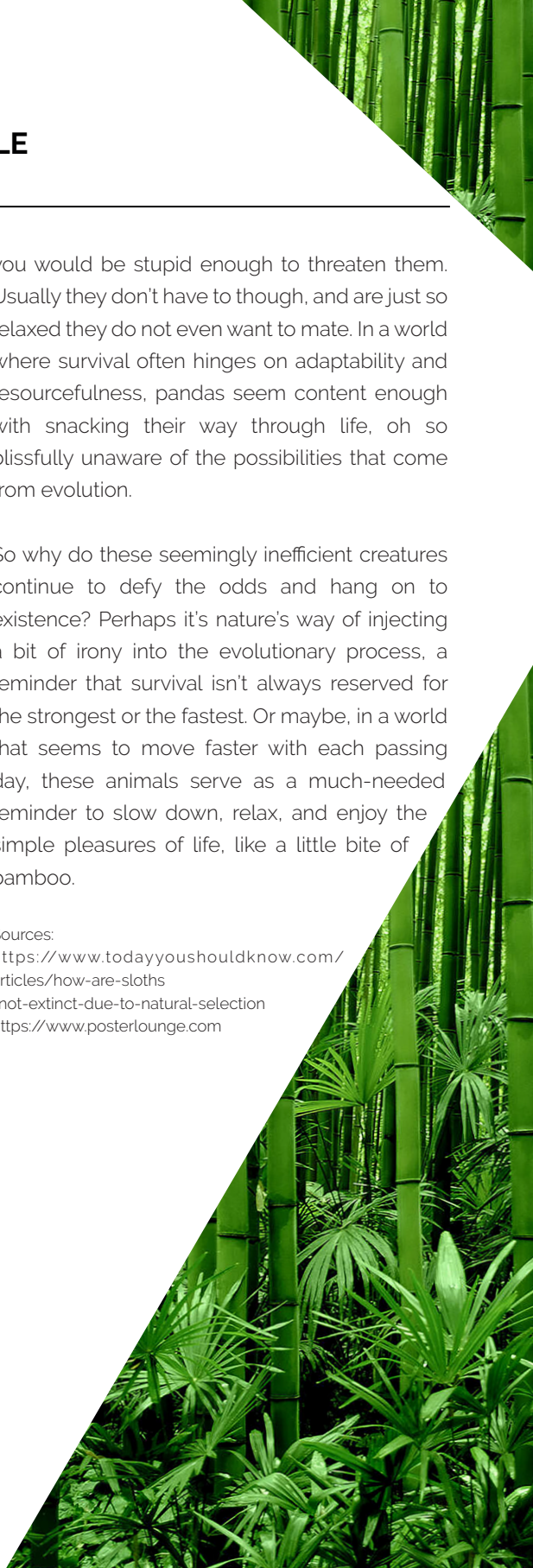

# WHICH CAR MATCHES YOUR PERSONALITY?

## MOTORSPORT

**Some people say that your personality can be related to a car, personally I believe I'm a Ford F150 myself but that's just my modest opinion. Whether you're a social butterfly or a lone wolf, discover which car best matches your personality with this quiz!**

1. When faced with a challenge, you tend to:
a. Confront it head-on and tackle it immediately.
b. Take some time to analyse the situation before taking action.
c. Seek advice from others before deciding on a course of action.

2. What's your idea of a perfect getaway?
a. Camping in the mountains or by a lake.
b. Renting a cosy cabin in the woods.
c. Exploring a vibrant city and trying new restaurants and activities.

3. How do you typically handle stress?
a. By exercising or engaging in physical activities to blow off steam.
b. By taking some time alone to recharge.
c. By talking to loved ones for support.

4. How do you prefer to communicate?
a. Face-to-face or through phone calls.
b. Texting or emailing.
c. It depends on the situation, but you're comfortable with various methods.

5. What role do you usually play in group settings?
a. The leader or organiser, taking charge and delegating tasks.
b. The listener or observer, offering insights when necessary.
c. The mediator oWr peacemaker, resolving conflicts and keeping the peace.

6. Which word best describes your approach to life?
a. Ambitious b. Reflective c. Sociable

7. Which of the following activities sounds most appealing to you?
a. Exploring a new hiking trail in the wilderness.
b. Curling up with a good book or watching a movie at home.
c. Attending a social event with friends or meeting new people.

8. What do you value most in a friendship?
a. Loyalty and reliability.
b. Understanding and empathy.
c. Shared interests and having fun together.

9. Which quote resonates with you the most?
a. "Life is either a daring adventure or nothing at all." - Helen Keller
b. "The only true wisdom is in knowing you know nothing." - Socrates
c. "Happiness is only real when shared." - Jon Krakauer

10. How do you typically make decisions?
a. Based on logic and reasoning.
b. Trusting your intuition and gut feelings.
c. Considering the opinions and feelings of others before deciding.

**If you mostly chose a: Jeep Wrangler**
Like the Wrangler, you're adventurous and ready to tackle challenges. You thrive in situations where you can take charge and lead the way.

**If you mostly chose b: Subaru Outback**
The Subaru Outback is known for its versatility, like your approach to life. You value reflection and careful analysis before taking action, just like the Outback's reliability and adaptability.

**If you mostly chose c: Volkswagen Golf GTI**
The Golf GTI is sporty, sociable, and always ready for a good time – just like you! You value connections with others, seek advice when needed, and thrive in social situations.









Thanks to F
for the lov



ATP









Fotosynthecie
vely pictures!





# ORTHOGRAPHIC DEPTH

## HOW WE COMMUNICATE

***Puhutko suomea? Jos et, tätä on luultavasti vaikea lukea. Se näyttää sinusta luultavasti vain siansaksalta!****

Contrary to what you might think, the previous sentences are not gibberish; they are written in a language you might have heard of--Finnish.

I recently visited Helsinki and was taken aback by how foreign Finnish looked to me. Despite recognizing individual letters and knowing of the umlaut's existence, I could not connect a single word to its translation in English, French, or Dutch. It quite literally looked like it had evolved from thin air. However, upon further research, I found out that it is one of the easiest languages to read. For an English speaker, yes, it is still one of the hardest languages to learn. However, once you know the Finnish alphabet, you can apparently read it with surprising ease. How, you may wonder? It is due to something linguists call **orthographic depth**. The orthographic depth of an alphabet indicates how much a written language deviates from one-to-one correspondence between letters (graphemes) and sounds (phonemes).

So, here you are, reading an article written in English. Arguably, you know virtually how each of these words is pronounced—and in fact, you should be impressed that you do, because English has one of the deepest orthographies. To demonstrate, there are seven ways of pronouncing 'ough'. It's said like the 'o' in 'go' for 'though,' like 'off' in 'cough,' like 'ow' in 'plough'—and that isn't even the half of it! Such orthographic depth makes learning English very difficult for non-native speakers.

Languages with a shallow orthography, on the other hand, like Italian and Finnish, have a near-perfect one-to-one correlation between phoneme and grapheme. The rule of thumb for Finnish orthography is actually 'write as you read, read as you write,' which enables you to read words such as *lentokonesuihkuturbiinimoottoriapumekaanikkoaliupseerioppilas* once you know the alphabet (try at your own risk). If you are curious, this word is allegedly the longest Finnish word and means 'airplane jet turbine engine auxiliary mechanic non-commissioned officer student'. Just imagine playing Scrabble in this language.

According to the orthographic depth hypothesis, presented in 1983 by Leonard Katz and Ram Frost, shallow orthographies can support a word recognition process involving the contrast between the various speech sounds involved. In contrast, deep orthographies push the reader to process a new word by looking at its visual structure, or spelling. This makes decoding words much harder in languages with deeper orthography, meaning children learn to read more slowly. For languages with a more shallow orthography, children learn to read relatively quickly.

So, the next time you want to learn a language which looks very complicated, don't be discouraged! You might just be pleasantly surprised at how easy it actually is. And even if you give up, it's probably a fun party trick to be able to correctly read a bunch of random, difficult-looking languages!

*Do you speak Finnish? If you don't, reading this is probably very hard. It probably just looks like gibberish to you!

# BIOLOGY ON A PLANETARY SCALE
## FROM CELLS TO SEAS

**Carl Sagan romantically called the earth the 'pale blue dot', but in technical terms, the earth is a closed system. As we all learned (or will learn) in Thermodynamics, this means that entropy can decrease, and this allows for a certain degree of organisation. We could also consider ourselves closed systems, and living ones at that! James Lovelock published a book in 1979 in which he describes the earth as one big living system which he names Gaia, after the Greek earth mother. We will do some more comparisons.**

The human body inhabits around 10 trillion cells. This is quite a bit more than the 8 billion people living on the planet right now, but we can fix that by making the whole world the size of Delft. Earth's total land area of 150 million square kilometres populated with 30000 Delftenaren per km2 doesn't quite get us there though, accounting for only a tenth of our desired population number.
Luckily 70% of cells are red blood cells, and coincidentally (or not?) 70% of the earth's surface is covered in water. This means our missing people, analogous to these red blood cells, are living under water so we don't need to worry about them anymore. Now we can start comparing cell types to human types.

People live in countries like cells live in their own tissue. Some tissues are bigger than others and some are more important too. All of them are connected by blood on which they rely for communication and nutrients. A group of different tissues work together to form organs, some of which work together to form organ systems, or continents in our scale.

Antarctica of course represents the brain. We know surprisingly little about Antarctica and it is isolated from the other continents. Europe, which is arguably more popular amongst the current inhabitants of Gaia, shall be the heart, as we are the centre civilization, and we historically controlled the seas, or the blood. South America could be the rest of the neural network as it lies closest to Antarctica. North America could be the respiratory system as most of the cells there are filled with air. You could say Gaia is suffering from a nasty cough at the moment. Asia is the most hard-working part of the world so it can be the digestive tract. It has to provide the rest of the system with all the nutrients and does all the laborious work. Africa is the reproductive organ because that is where we all come from in the end. Oceania contains a bunch of little islands just like the pancreas, so it represents a cluster of organs most people are less familiar with. You can survive without going to both the islands of New Zealand, just like you can survive without one of your Sydney's, I mean kidneys.

We are still missing a couple of cell types however, like skin, muscle, and bone. These tissues are alive themselves, but must represent broader concepts, like the atmosphere, which protects the earth, the mantle, which moves the continents through convection, and finally the core, the physical centre of it all. So are the atmosphere and mantle alive? Angels, demons perhaps? This has all become rather confusing and even a bit spiritual... maybe it's time to go back to the drawing board.

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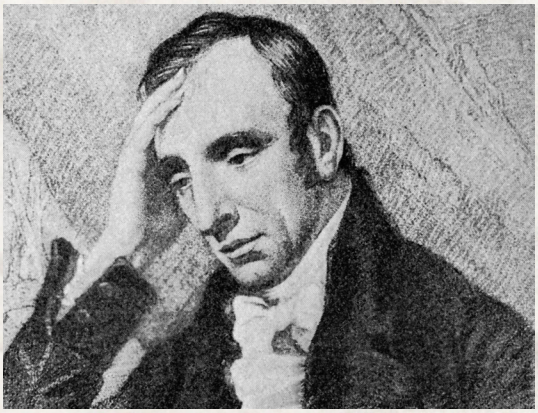
# TORTURED ARTISTS

## THE ULTIMATE SAD GIRLS

**"Take me to the lakes where all the poets went to die," a line from Taylor Swift's song *The Lakes*, is a crucial example of the timelessness of the human desire to be sad. She references a district in Northwest England, where notable poets such as William Wordsworth, went to live out their lives. Although Taylor Swift could be considered a tortured poet herself, here, she takes the spot of the consumer. She reflects the universal desire to escape from all your problems and live out your days in solitude. From the tortured poets referenced, to painters, to the modern tortured artists, it seems as though the art we consider great, demands emotional turmoil.**



Whether suffering from anxiety, depression, or any number of mental illnesses, much of the most recognizable pieces of art have the story of a tortured artist behind them. A notable example that may have already come to mind is Vincent Van Gogh. There are not many scenarios in which Van Gogh escapes a comment about his deteriorating mental health when discussing his most famous works. In parallel, many songs today are often accompanied by their own anecdotes of some depressing story of what the artist was going through when making the song. From the disturbing poems my teachers would make us memorize and recite in elementary school, to the sad songs I willingly consume now, there seems to be a correlation between what people consider "sad art" and "good art." Art is subjective, of course, and what we consider good art when we're sad, is different to when we are feeling better. What is true, however, is that negative emotions lead to a lot of internal chaos and confusion, where "sad art" can help intellectualize those feelings.

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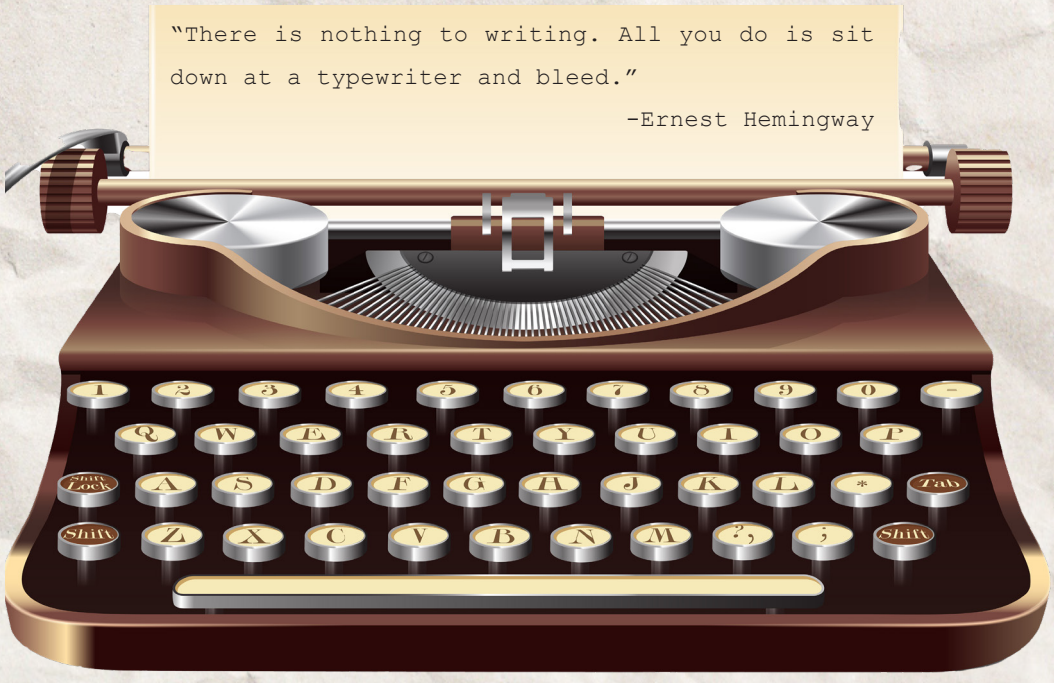
It seems to do two opposite things at once: it lets us feel less alone, knowing that this emotion is something felt by the masses, but it also dramatizes the emotion being felt and helps play to our own narcissism.

All this is not to say that good art can't be 'happy' art or made by a happy artist. In fact, much of the Renaissance era is defined by the exploration of life and its beauty, some of the most influential pieces of art being made during this period. All things said, although well renowned art often comes from a tortured artist, those two things are not mutually exclusive. Analysis of the role of tortured artists in our world demands nuance, as each time period comes with new technologies and mindsets that influence what is popular.

Tortured artists in current times are becoming especially popular, as the general mindset of society is becoming more and more pessimistic. The political, global, and economic climate is making us feel more helpless, the artists we look up to grow more tortured as well. As these artists create art to cope with this helplessness, we look to their art to cope with ours. It's hard to tell whether this is a vicious cycle or a valid method of catharsis, but it does seem to be the track that our generation is on, and it further cements the role and influence of tortured artists in society.



# NANO MUSIC

## DNA SYMPHONY

**All music is composed of 12 notes. And all life is composed of only 4: A, T, C, and G! This is way more efficient in my opinion, but it also nicely shows that music is in our genes. On the other side of the spectrum, if you prefer the more mathematic Differential Equations, you'd be surprised to know that sound waves and techno music are governed by the wave equations and Fourier series.. It might not be a coincidence that we encounter so many music-related features when doing nano-research. We might even be able to collect enough examples to form a nano-music group!**

Let's start with the major scale of nano, the central dogma; in replication we find a prime example of nano music: the replication trombone. As you all know, when building DNA we do so by starting from the 5' end and adding new nucleotides on the 3' end. At the replication fork, or you could even call it a tuning fork, we find a 3' and a 5' side. However, this poses a problem. One strand can continuously be replicated but the other has to be replicated in steps, the Okazaki fragments.

Luckily, the replication machinery forms a beautiful trombone shaped complex that makes replicating the sounds of life a bit easier.

We also need some percussion for our combo. You could use the clicking of a pipette, but at the Farbod Alijani lab they like to drum at the nanoscale. They are investigating the non-linear oscillations of graphene by banging it like a bongo. Using an electric field to offset their tiny conga's from equilibrium, they were able to produce awesome, unheard, wave-forms. Banging the bongo very hard even produces chaos in the centre of the signal...

Chaos sounds super metal and all but what is nano music without a nano guitar? Luckily a string is literally just a one-dimensional wave equation, so just six of those and you're done. If you like a more classy approach you can replace your conga by timpani and guitar by violin. Multiply by the latter by twenty, add some replication horns, and we have a full blown symphony. Now you can play Beethoven times 10^-9!

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https://bit.ly/44Mw9B8

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*>> rng('shuffle');*
*>> randi(nr_leden)*
*ans = 268 %Lucia Calzado Garcia*

# JEALOUSY, TURNING SAINTS INTO THE STREET?

## RANDI

**If you are as bad at remembering lyrics as I am (well, probably not as bad, I truly am terrible), you will have experienced the same confusion as me when you're trying to find the words and end up turning up with something that makes no sense. But did you know that when something like this happens, our brain has a measurable negative reaction to it?**

Let me demonstrate. Never gonna give you up, never gonna let you down, never gonna run around and desert pumpkin. Your brain hates me right now. Let's go again. 1+1+1+1 = 76. Butterfly eyespots are claspill. Luke, I am your aunt. Incredibly unsatisfying? Well, if you let me put a fashionable electrode in your scalp, and obtain the so-called Event-Related Potentials (basically the result of a voltmeter trying its hand at mind-reading), we would see an anomalous bias towards negative potentials at about 400 ms from the strange sentence ending. This is the N400 response.

What does it mean? Well, there are quite a few theories for it. Some think that it shows that the brain makes predictions of where a sentence will end, and N400 is the prediction error response. Like your brain had bets on who would win the bobsleigh gold medal, and it turns out to be Jamaica. Other people think the prediction error response happens before the meaning of the word is even processed, showing some implicit linguistic ability of the human brain (this is a bit of an unpopular opinion lately, but Chomsky can't always win).

Regardless of what it means, at the very least it shows that the processing of meaning by the brain is reflected in the brainwaves that we then detect. This, in fact, had already been shown with another similar response.

P300, as you might guess, is a positive bias response in the potential that happens 300 ms after a surprise event. For example, you're sitting in front of a computer that can play flashes of colour or no flash and a click. But one is three times more likely than the other. Well, when the unlikely event happens, your brain responds! Cool, right?

This is actually so predictable, that it is legal in many places to be used as a lie detection test, which I personally think is incredible. Not only that, but some people are working on creating a brain controlled interface for computers. Mind Blowing, honestly.

Imagine a world, not that far from today, when you can just think, and the technology around you picks up on the ERPs, and the N400, and the P300, and so many others, and makes stuff happen around you. Scary, in my opinion, but so, so, promising.

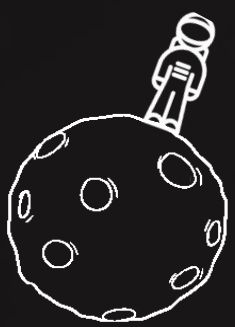
And with that, I'm out, cuz "she doesn't even go here!"

# FUTURISTIC MOVIES OF THE PAST COMPARED TO TODAY

## CINEMATOGRAPHY

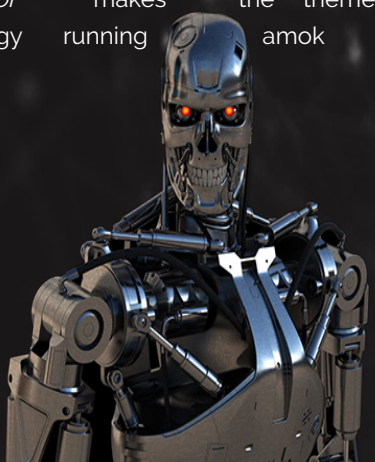
**People often say our society exists in extremes, and science fiction is no exception. Much of the science fiction movies that have come out since the inception of cinema exist in optimistic utopias or pessimistic dystopias. It's not a stretch to say that it was a universal experience to dream about the future as a child, asking questions like "What if cars can fly in the future?", "What if we can fly?" Of course, as we became older and gained a deeper understanding of the scientific world, we understood what was attainable and what wasn't. The way that the media depicted the future to the adult audience was starkly different from the fairy tales we dreamt about as children. The future is shaped by current events, how society thinks, and is heavily dependent on the current time period.**

Up to around the 1960s, science fiction contained both utopian and dystopian movies. In wartime, movies such as *Metropolis* portrayed idealistic cities with skyscrapers and advanced technologies, giving people a sense of hope during dark times. On the other hand, this vast development of technology in the industrial age also came with fears of unchecked progress, giving books such as *Brave New World* and *1984*, which are still relevant to this day.

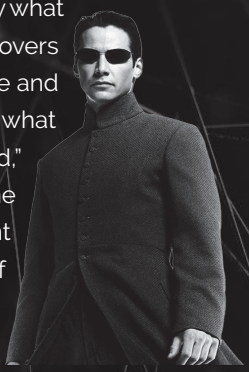


The 1960s brought on its own wave of fear with the start of space exploration. In this backdrop of the space race between countries, Star Trek depicted a future where people had solved their divisions, and everyone was united, this oh-so-subtle message coming at a time when tensions between countries rose in their race to the moon. Additionally, the '60s came with a lot of political unrest and upheaval, yielding films like *Planet of the Apes*. Depicting prejudice and discrimination towards humans by the apes, this movie was a clear callback to the ongoing protests at the time, and it warned of the abuse of power and prejudice and what it could lead to.

The fears of unchecked technological progress carried over into the '80s coupled with the new fear of global warming and climate change. Because of this, the science fiction movies were darker overall. *Blade Runner* is a very clear and cohesive example of the conglomeration of fears felt by society during this time period. The movie depicted an overcrowded and polluted Los Angeles run by corporations. Similarly, *Terminator* makes the theme of technology running amok very clear.



As we entered the 21st century, it became clear that corporate control and technology running rampant was not a far-fetched fear, and thus we got films such as *The Matrix*. As a movie about humans being controlled by what are essentially robots, it covers this theme of uncontrollable and powerful technology. The "what if robots take over the world," question has only become more and more relevant since the development of artificial intelligence, and *The Matrix* continues to become increasingly relevant.



Over time, science fiction and the way the future is depicted in movies is less of an actual prediction, and more of a mirror to our fears and worries. As kids, we dreamed of the possibilities of technology and progress and how different the world would look when we grew up, or how different it would look like generations after us. Technology was something to admire, and the progression of new inventions brought excitement. Now, those same progress and inventions are met with intense worry, as technology becomes more powerful and eerily sentient (take ChatGPT for example), and these dreams don't seem to exist anymore. We worry about our jobs, we worry about the control and chokehold that technology has on us, and we worry about what this technology is doing to our natural world. But although media and movies now reflect our worst fears of society, we should keep a healthy balance between these fears that keep us in check and our desire to strive for scientific advancement and innovation. bigger than the motor itself.

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# SEMANTIC CHANGE

## HOW WE COMMUNICATE

**Hello, dear reader! What a gay day, is it not? Summer's approaching; although I'm sure you cannot wait, be patient. Remember: *don't* be nice, and stay in school! You are pursuing a truly awful degree that will get you far in life.**

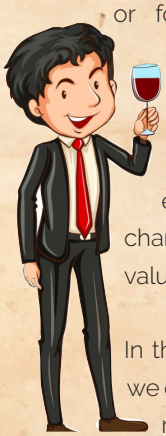
Did these last sentences confuse you? Well, they should, but they're technically correct… and *not* because you think your study sucks. The words 'gay,' 'nice,' and 'awful' once meant entirely different things than what you think they mean now. In the 13th century, 'gay' meant 'joyous' or 'lighthearted'. It was not until 1935 that the word became associated with today's definition of 'homosexual'. As for 'nice,' it actually used to mean 'foolish, ignorant, and senseless'. So, indeed, don't stay ignorant; get an education! And not an 'awful' degree as in 'bad,' but 'awful' as in 'full of awe' or 'impressive,' which is its original meaning—perfectly fitting to describe the Nanobiology degree.


Such change in the meaning of a word over time is called a semantic shift, and it has attracted continuous academic discussions since ancient times. After the first significant works on the subject came out in the 19th century, many theories categorising types of semantic changes and hypothesising their causes emerged. Today, the most widely accepted one in the English language was presented by Leonard Bloomfield in 1933. It mentioned—amongst other semantic change types—the narrowing or widening of word meanings and their degeneration or amelioration. One example of narrowing is the word 'hound'.


Originally from the German word 'hund' meaning 'dog,' 'hound' was traditionally used to refer to any type of dog, but as the English language developed, its meaning narrowed until it only denoted dogs used for hunting. As for widening, one common example is the word 'business': initially, it only described a busy person, but today, its meaning has broadened to refer to any type of work or job.

Earlier, I mentioned an example of semantic amelioration in the word 'nice.' The

opposite of such betterment is the degeneration, or pejoration, of meaning. This phenomenon can be seen in the words 'retarded,' initially meaning delayed or slow, becoming a derogatory term for a person with an intellectual disability, or 'silly,' originally used to describe someone as happy or fortunate, and today associated with connotations of foolishness and idiocy. Sociocultural factors are one of the most significant driving forces for such meaning evolution, so analysing semantic change helps us reflect on our social values and cultural attitudes over time.



In the English language, for example, we often notice a pejoration of female-related terms while their male counterparts retain their original and respectable meaning, thus reflecting sexism in society and negative attitudes towards women. For example, in the past, 'mistress' referred to a woman who had authority and was the female equivalent of 'master'. This term went through pejoration and, today, refers to the girlfriend of a married man. Another example is 'spinster,' the female equivalent of 'bachelor,' which just means unmarried woman or man, respectively. Today, while the bachelor remains an eligible young man, the spinster is a derogatory term denoting an old, repressed, childless, and unmarried woman. Also, have you noticed that these male terms not only kept their meaning but are also now the degree(s) you will/have receive(d)? Talk about linguistic sexism.

Of course, today, we often use these words without thinking of their sexist origins. Most of us don't bat an eye if a woman is a 'Bachelor of Science' or a 'Master of Engineering'. However, words do matter: they shape how we communicate and think. They are powerful, but so are we. A language is transformed through its users, so the next time you use a derogatory term, even one as 'gender-neutral' as b*tch, think about its origin (meaning a female dog) and posteriority. Do you really want the English language, which is the most spoken language in the world (in general, not by native speaker number), to devolve through the degradation of an entire sex? Or do you want to actively participate in reshaping our minds for a more inclusive world?

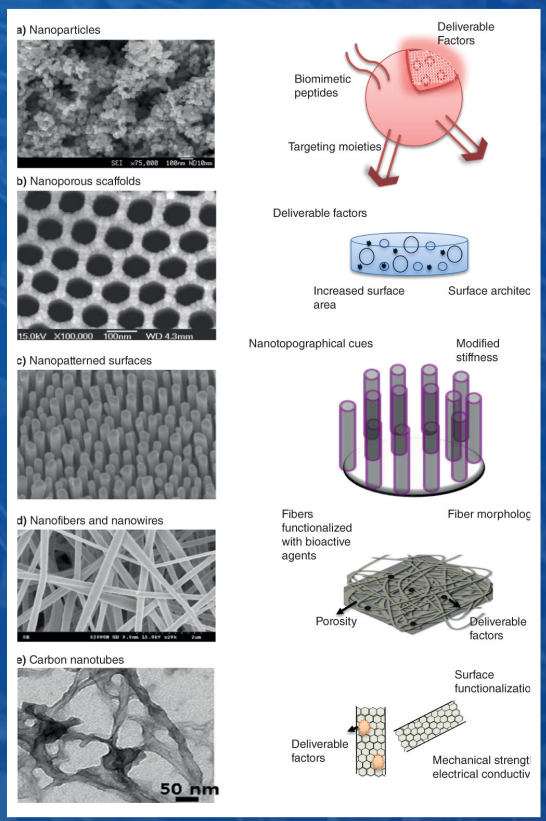
# ADVANCEMENTS IN NANOMATERIALS FOR TISSUE ENGINEERING
## NANONEWS II

**In the ever-evolving landscape of biomedical research, nanotechnology has emerged as a transformative force, particularly in the realm of tissue engineering. By harnessing the unique properties of nanomaterials, scientists are pioneering innovative approaches to regenerate and repair damaged tissues, offering new hope for patients with various medical conditions. WWWThese advancements not only propel the field of tissue engineering forward but also contribute significantly to the broader domain of nanobiology.**

Nanomaterials, typically ranging in size from 1 to 100 nanometers, possess exceptional mechanical, electrical, and biological properties due to their high surface area-to-volume ratio and quantum effects. These characteristics make them highly adaptable for biomedical applications, including drug delivery, imaging, diagnostics, and tissue engineering.

In tissue engineering, nanomaterials play a pivotal role in creating scaffolds that mimic the natural extracellular matrix (ECM), providing structural support and biochemical cues to guide cell growth and differentiation. Traditional scaffolds often lack the intricacies necessary to mimic the complex microenvironment of native tissues. However, nanomaterial-based scaffolds offer precise control over features such as pore size, surface topography, and mechanical stiffness, allowing for tailored interactions with cells and promoting tissue regeneration.

One of the most significant advancements facilitated by nanomaterials is the development of "smart" scaffolds capable of responding dynamically to the physiological cues of the surrounding tissue. These stimuli-responsive scaffolds can release bioactive molecules, growth factors, or drugs in a controlled manner in response to specific triggers, such as pH, temperature, or enzymatic activity. This capability enhances the spatiotemporal control of tissue regeneration processes, promoting more efficient healing and integration of engineered tissues.



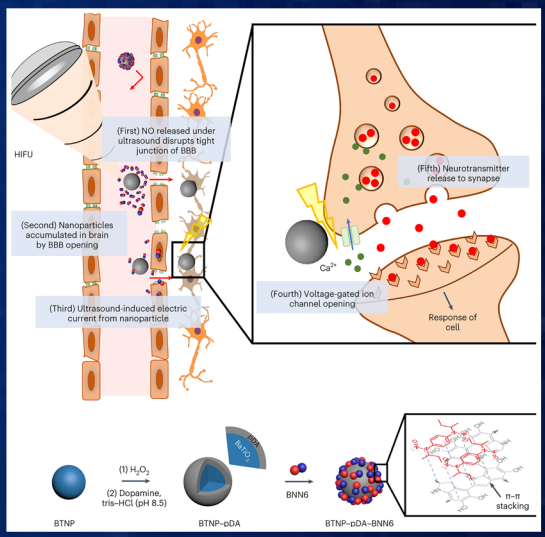
Furthermore, nanomaterials enable the incorporation of bioactive molecules, such as growth factors and cytokines, into scaffolds with enhanced stability and bioavailability. By precisely controlling the release kinetics of these molecules, researchers can orchestrate cellular responses, modulate inflammation, and promote tissue-specific regeneration. Additionally, nanomaterials can be functionalized with cell-adhesive peptides, signalling molecules, or genetic materials to further enhance their biological activity and promote cell attachment, proliferation, and differentiation.

In recent years, the convergence of nanotechnology with other cutting-edge fields, such as 3D bioprinting and stem cell technology, has opened up new frontiers in tissue engineering. Nanomaterial-based bioinks with tunable rheological properties allow for the fabrication of complex, biomimetic structures with high resolution and fidelity. These bioinks, combined with stem cells and growth factors, hold immense potential for generating personalised tissue constructs for regenerative medicine and organ transplantation.

Moreover, the integration of nanomaterials with advanced imaging modalities, such as magnetic resonance imaging (MRI) and near-infrared fluorescence imaging, enables real-time monitoring of tissue regeneration processes in vivo. This capability provides valuable insights into the spatiotemporal dynamics of cell behaviour, scaffold degradation, and vascularization, facilitating the optimization of tissue engineering strategies for clinical translation.

Beyond tissue engineering, the advancements in nanomaterials have profound implications for the broader field of nanobiology. The interdisciplinary nature of nanobiology, which encompasses the study of biological phenomena at the nanoscale, is inherently enriched by the integration of nanotechnology with biological systems. Nanomaterials serve as versatile tools for probing cellular processes, studying biomolecular interactions, and designing innovative therapeutics for various biomedical applications.

The advancements in nanomaterials for tissue engineering represent a paradigm shift in regenerative medicine, offering unprecedented opportunities to engineer functional tissues and organs for clinical applications. By harnessing the unique properties of nanomaterials, researchers are not only pushing the boundaries of tissue engineering but also driving the evolution of nanobiology toward new frontiers of discovery and innovation.

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# HOW WELL DO GLASSES ACTUALLY DISGUISE PEOPLE?

## UNMASKING THE TRUTH

**Each morning for the last seven years, after waking up, I immediately put on two framed glass lenses that would bring my world into focus. Every waking second (sometimes even accidentally in the shower or in bed) I would be wearing what to some people could be considered a disguise. I never understood the world of Clark Kent or Superman; how people so close to him could go from not recognising him to recognising him in the same amount of time that it takes to wear a pair of glasses. I was convinced that this godly entity with what seemed to be no weaknesses picked the lamest disguises known to man. That is, of course, until one day, I randomly decided to not wear my own pair, and a friend I've known since birth couldn't recognise me in a photo.**

The truth is, glasses have the weird power to alter people's perception of you. The frames, whether thick or thin, metal or plastic, colourfully bold or black, can drastically change a person's facial features, affecting whether or not people recognise them. Part of the reason this phenomenon occurs has to do with the way the human brain is wired to recognise faces, which does not focus on individual features but rather the face as a whole. Glasses introduce a significant change which can be enough to disrupt recognition and create a sense of unfamiliarity, even with people you know.

Glasses can also affect the perception of personality traits, most likely due to the portrayal of people with a predisposition for blurry vision in the media. The stereotype of the thick-rimmed, four-eyed nerd is part of the reason that glasses wearers are often perceived as more intelligent and scholarly. This cognitive bias can also contribute to a disguising effect as it can become harder to recognise an individual's demeanour due to the shift in perceived personality.

Several studies were conducted to test this phenomenon, most notably the 2016 study from the "University of York", which asked participants to compare pairs of photos and identify if they saw the same individual twice in them. Participants were able to correctly identify the same individual around 80% of the time; yet, when shown pairs of photos where only one of the two individuals was wearing glasses, the accuracy dropped to 74%. This 6 percentile point drop confirms that glasses disrupt natural facial recognition.

While as a disguise, glasses may seem comically simple, they are surprisingly effective. So whether you plan to construct a glasses-free alter ego and confuse your friends, just as I did, or you're planning to conceal your identity from supervillains, like in the case of Superman, four eyes may be better than two.

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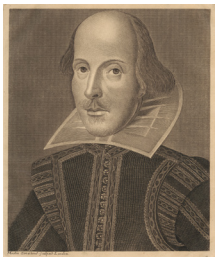
# MAKE YOUR OWN STICKERS

## DIY



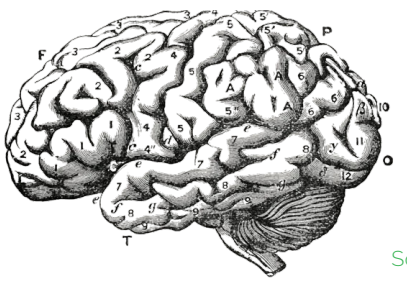











# MAKE YOUR OWN STICKERS

## DIY

**Have you ever wanted to make your own stickers? If yes, today is your day, follow this step-by-step guide to the 101s of sticker making.**

Materials:
1. Scissors
2. Baking paper
3. Wide clear packing tape
4. Sticker cut outs

Instructions:
1. Using your scissors, cut out the silhouettes of the stickers on page 29 stickers (expert tip: Read through this protocol before cutting to avoid reading the instructions of paper scraps).

2. Stick a piece of the clear packing tape face down on a sheet of baking paper; the piece should be big enough for your chosen sticker to fit inside.

3. Place your chosen sticker face up, directly on top of the piece of tape and baking paper.

4. Stick a second piece of packing tape on top of the cutout. Your sticker should be sandwiched in between two tape pieces.

5. Cut out the sticker and simply peel off the baking paper before use.

6. Repeat the above steps for the rest of the cutouts and stick to your heart's content.

Image Sources:
Rawpixel.com
Flickr.com
Wikimediacommons.com

# PUZZLES

## HUMAN CONNECTION

| R | S | A | E | C | O | N | S | P | I | R | A | C | Y |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C | E | T | C | A | M | A | R | A | D | E | R | I | E |
| O | L | C | A | D | V | A | N | C | E | M | E | N | T |
| M | A | G | A | E | Y | O | U | M | R | K | O | R | N |
| M | N | R | S | D | E | I | S | O | I | I | E | N | K |
| U | G | O | K | E | C | C | H | A | T | G | P | T | G |
| N | U | U | I | A | O | U | K | G | A | N | M | S | D |
| I | A | P | P | E | R | R | O | U | R | N | I | C | C |
| T | G | W | M | A | K | T | C | D | G | A | M | L | E |
| Y | E | O | E | T | G | O | I | A | O | D | T | C | P |
| T | M | R | O | A | G | C | E | S | M | E | R | M | D |
| A | Y | K | T | C | A | T | O | A | T | M | K | R | C |
| M | S | E | I | R | O | T | S | A | E | S | W | I | O |
| C | O | M | M | I | T | T | E | E | A | O | S | T | U |

Chatgpt

Groupwork

Artists

Committee

Language

Advancement

Conspiracy

Stories

Camaraderie

Community

Across

1. famous Dutch painter, known for '*The Starry Night*'
6. era of history filled with art following the mediaeval times.
8. Character from a shakespeare play known for his sacrifices for love.
9. superman alter ego
10. study association for nanobiology

Down

2. classic greek epic, or a classic family car
3. event where everyone comes toether to danc and have fun.
4. ceo of facebook
5. red pill blue pill
7. 'musical notes' of life