

# SONGS

L I F E L I N E



YEAR 16  
EDITION 4

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# PREFACE

Greetings beloved Idunaren,

I am proud and a little sad to present to you: the last Lifeline of the academic year, this time with the theme 'Songs'. One of the coolest editions so far, as each article is related to an actual song. Our writers and lay-outers did their utmost best to make a cool, interesting, and educative Lifeline for you, and I couldn't have been prouder. Music is pretty big in our lives. It is diverse, there is something for everyone. It also connects us and allows us to express ourselves. Some songs take me back to the days when I still watched a videotape, others when I first went to the club, and some even take me back to high school. Songs often equal memories, whether they are good or a little less fun. Music that makes me feel nostalgic, however, is my favorite. For this edition, I hope you enjoy the songs, articles, reviews, and more :)

Lastly, a little surprise riddle for y'all: all the Lifelines of this academic year are connected somehow, and two connections can be found. These connections are present in all 2021/2022 Lifelines. Solved the riddle? Send your answer to [redactie@idun.nl](mailto:redactie@idun.nl), and maybe you will win a prize!

It has been an honor being your chair. Thank you.  
Lots of love,



♫ dEaR MeMbErS, ♪ ♪

If all the lifelines of this year would together be a song, then this edition would be the outro. This song would start a bit all over the place, would have an erratic bpm, and quickly grow to a crescendo. The theme of this intro would of course be 'stress'. And for those of us well versed in musical terms, we would experience a pianoforte. Where the intro, now, a cacophony of sound is leading into a musical break which epitomizes the fast nothingness of the second Lifeline theme: 'space'. To fit in the next theme and to incorporate something pretentious about this third theme. I did some research. At Wikipedia, of course. Here, I found the concept of spectral music, which uses acoustic properties of sound as a basis for composition. Often mathematical analysis of sound spectra or mathematically generated spectra are used to compose spectral music pieces. Meaning that this year's song also is one of a spectacular sophisticated arithmetical design. This type of spectral music, thus, fittingly refers to the third Lifeline: 'spectrum'. But to every song comes an end. Including this figurative song that is made up of four parts. For you, the reader, there is just one edition leftover to read, and I think it is apparent by now that the theme of this edition is 'songs'.

♪ ♪ WiTH KinD reGaAaRDSs ♪ ♪,

*Thomas Westerhuis*  
Chairman of GLV Idun 2021-2022

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# SCIENTIFIC

By Marit Bonne, Jelle de Jong, and Anette Hallik

# NEWS

## Road rage behold: AI is on its way

It is one of my greatest horrors: driving to the city center of Groningen. Gazillion of cyclists do not care where they cycle nor do they indicate their next move. On top of this, pedestrians that suddenly cross the road. How will I drive a four-wheeled vehicle without hitting someone?? Artificial intelligence has struggled with the unpredictability of traffic (read: humans) for ages and unfortunately, this holds back the transition from manual cars to robot-driven ones. Current AI solutions for predicting human behavior in traffic are either too conservative (to avoid hitting pedestrians, the robot car will simply not drive), too simplistic (the robot car will assume pedestrians will always walk in a straight line), or only predicts one agent of traffic, such as one pedestrian, or one car.

However, MIT researchers found a rather simple solution to this seemingly complex problem. They used a multiagent behavior prediction problem and separated it. This way, the robots could predict the complex behavior per agent, which gave a much more accurate estimate of the trajectory than other machine-learning models. Researchers say that this approach is very user-friendly, as it breaks the problem down into several pieces. This makes it much easier for someone to understand, thus simultaneously putting more trust into the model. Next to this, the model is similar to how humans themselves make decisions: quite fast and without thinking about hundreds of combinations. So in the end, maybe driving in the city center of Groningen might be a little less of a horror.



## Space rocks! A way of life?

One of the greatest mysteries still left to uncover is the origin of life on earth. In the Space edition of Lifeline I wrote an article about the possible interplanetary travel of life. Since then, some nice progress has been made. With the current state of DNA sequencing and bioinformatics it can be confidently said that all known life on earth shares a common ancestor. Whether that common ancestor evolved from a proto-organism here on earth, or on another planet, is not known. In this age of reusable rockets scientists are getting ever closer to find an answer. If life on earth originally travelled here from space, the clearest evidence would be to find signs of life in or on space rocks. NASA (National Aeronautics and Space Administration) and JAXA (Japan Aerospace Exploration Agency) have done just that. Not only have they analysed elusive carbon rich meteorites (fallen space rocks), they have gone even further by sending robots to space to collect samples from promising carbon rich asteroids (space rocks). This April, a big step was made; it is

now known that all of the important nucleobases of life (A, U, C, G, T) can be and have been found on these meteorites and asteroids. The results strengthen the motivation to look for more complex biomolecules in space.







## Yoghurt lowers the risk of diabetes?!

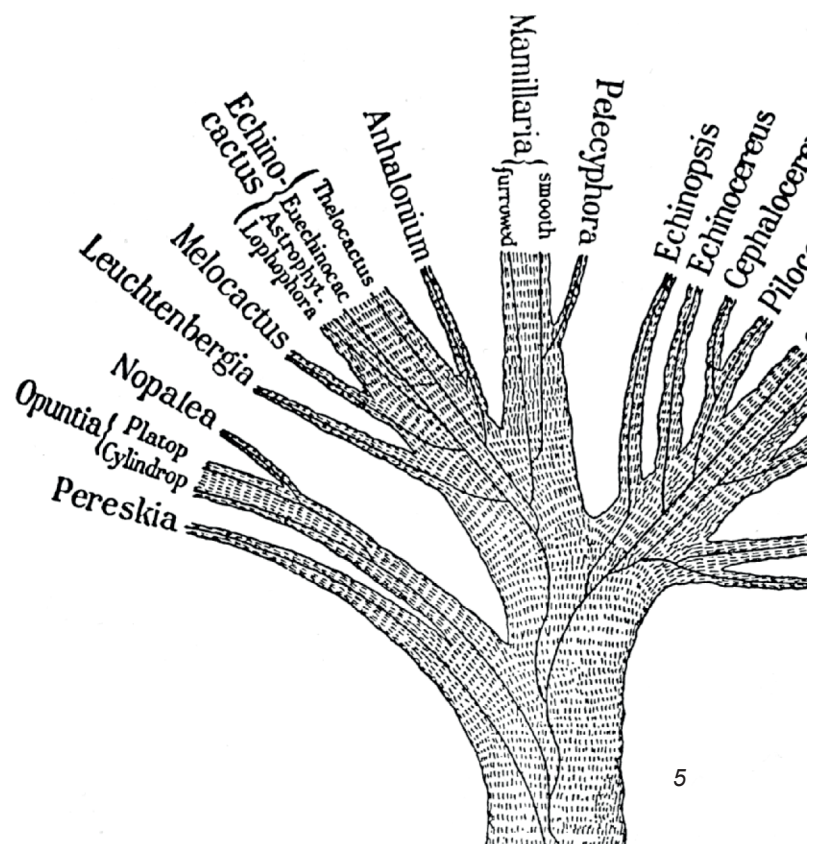
In light of the increase in obesity in recent decades, type 2 diabetes has started threatening more and more people every year. Type 2 diabetes can be treated with medication or by a switch to a healthier lifestyle. A few years ago, scientists found that regular consumption of yoghurt decreases the probability of developing diabetes, but there was no real explanation for why it would have such an effect. After much research and studies on mice, it has been revealed that the lactic bacteria in yoghurt produce special metabolites - branched-chain hydroxy acids, or shorter, BCHAs. These metabolites help the organism control the blood sugar level, liver function, and insulin resistance, all of which impact the development of type 2 diabetes. The control group of mice who did not eat yoghurt and was on a sugary diet (the main cause of diabetes) started gaining weight and developing diabetes. Therefore, yoghurt really has an impact on your body's resistance to diabetes. So take care of your health, don't get diabetes, and eat yoghurt!

## Biogeography: a new method

Oh, the beauty of a phylogenetic tree. As a biologist, I truly enjoy the lines, the connections between taxa, and the intertwining of different species. However, recent research shows that current evolutionary trees are misleading and not accurate enough.

Scientists at the Milner Centre for Evolution at the University of Bath say that we have been using anatomy to classify organisms into different taxa, but this rarely tells us the whole story about an organism's origin. The pieces of the evolutionary puzzle can be put together with very quick and cheap methods based on genetics, revealing that some species are very closely related, while other anatomically similar ones (for example, the great tit and blue tit) belong in different branches of the tree.

The research showed that an evolutionary tree that was based on genetics fits way better with the geographical distribution of species. This is important, as the 'biogeography', as they call it, is a great source of evolutionary evidence. Furthermore, the study emphasizes the occurrence of convergent evolution, and that it happens way more than we thought before. As one of the researchers nicely quoted: '[the outcome of the study] means that convergent evolution has been fooling us – even the cleverest evolutionary biologists and anatomists – for over 100 years!'





# TRUE COLOURS

## HOW ANIMALS VIEW THE WORLD



By Juultje Eenink

"I see your true colours shining through. I see your true colours and that's why I love you." A song by Cyndi Lauper, but that could very well be written by one of the animals discussed in this article. Why? Because the sight of animals often differs a lot from human sight. Seeing less, seeing more, all in all: seeing differently. So, what are the true colours of the world for these animals?



### Dogs

It is a misconception that man's best friend can see no colours at all. Dogs do see less colours than humans, which is caused by them having two types of colour photoreceptors, as opposed to the three we have. They can only see yellow and blue, similar to a human being red-green colourblind. Drawing a red heart on the love declaration to your furry friend, sadly, will turn out to be a poopy brown blob.

A blob, because dogs see less clearly than humans. This may seem like a lot of setbacks in the eye zone, but dogs have developed another sense way superior to humans: smell. Just like sight is our main identifying sense, smell is the main identifying sense for dogs. They recognise places and other beings by smell. While we can be glad we do not have to be able to recognise our acquaintances by smell, you have to admit: it is sniffing impressive.

### Birds

A group that surprised me. Not by pooping on my head this time, but by the type of vision they have. They have 4 cones, with the fourth one being able to detect ultraviolet light. They do not just see stuff differently; they see stuff we cannot see at all.

Ignorantly, we failed to acknowledge this for quite a while. A lot of bird species turned out to be sexual dichromatic, where males and females look different when looked at from a bird's perspective, including UV-light. We had categorised them using our more limited vision, and thought they were monochromatic.

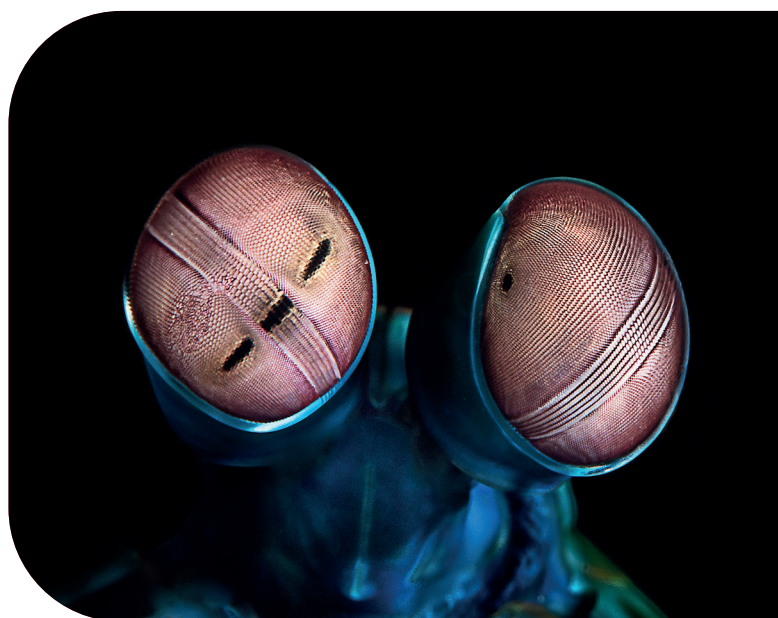
Including UV-light when categorising birds is just the start. Birds' vision is different in more ways: they perceive a greater diversity of colours than humans. Birds are capable of differentiating two colours a human eye cannot see, all because of oil droplets that enhance colour vision in their eye. Now that's something to crow about.

### Shrimp

Last but not least: the mantis shrimp. This tiny creature has me at a loss for words. It has twelve, yes twelve different types of cones in its tiny eyes. I, again, want to emphasize we as human beings have a mere three. But that is not all. Mantis shrimp can also detect ultraviolet and even polarized light.

We cannot imagine the way in which this animal sees the world. Trying to make up a new colour is impossible enough. On top of this the visual structure of the shrimp also differs completely from ours. It has compound eyes that consist of around 10,000 photoreceptive units. Of these units, some are arranged as stripes across the eye. To see, the mantis shrimp scans its surroundings or the object it tries to identify, like a photocopier.

The many photoreceptors and different cones allow the shrimp to save up on brain processing. The interpretation of what is seen is done in the photoreceptors immediately. This differs a lot from the way we see, where different photoreceptor input is compared and combined in the brain. Since brain processing costs a lot of energy, it is preferable to minimize brain processing. However, all things considered it seems like a waste to be able to see so many colours while not being able to process them...







# THREE LITTLE BIRDS

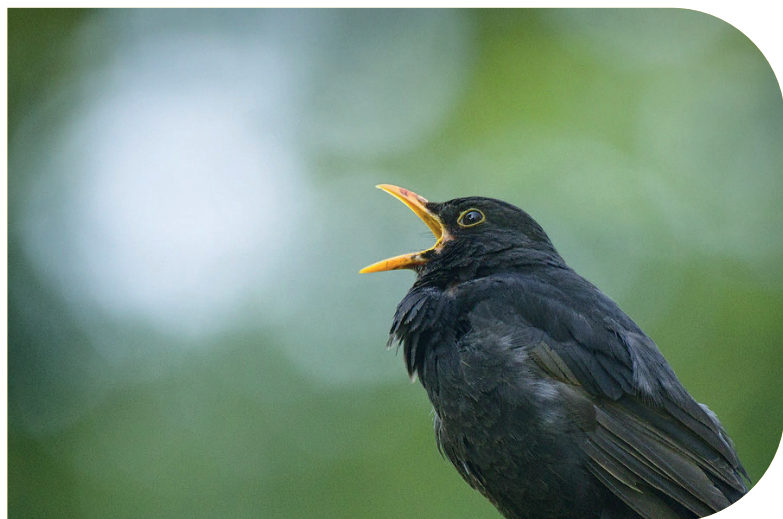
## WHY BIRDS SING SO MUCH



By Jelle de Jong

Long before humans were around to sing or compose songs, birds were the undisputed musical masters of this planet. There are roughly 50 billion birds globally, divided over an estimated 18000 species. About half of the known birds sing distinct songs, from simple to extremely complicated, with a repertoire ranging from a single song to many thousands of songs. Why do all these birds learn to sing all these different songs?

Bird calls are usually a signal for danger or distress, much like we use short, clear messages to alert other people. Think of when we yell “fire!”, or “watch out!”, or when we scream someone’s name to get their attention. Through sound it is possible to deliver quick messages over great distances. Much like we do, certain birds have unique sounds for different occasions. The alarm call of a bird when it spots a raptor (bird of prey), can be compared to an air raid siren. One call can make countless others alert of



possible danger. This social behaviour and

communication allows birds to be more at ease when in larger groups. It is no surprise that communication like this convergently evolved in many species.

Bird songs mostly have to do with attracting mates and mostly can’t be heard all year round, opposed to calls. A third of all song birds only sing one song, for those birds singing is not much more than a part of the mating ritual. These birds are so called close-ended learners; they can only learn songs in the first months of their life, there is no need for them to listen for inspiration since they only sing the same song anyway.

Birds that can know up to thousands of songs are open-ended learners; these birds are always listening and composing new songs. Learning more than one song convergently evolved many times, which means there must be a positive effect. One of

these effects that makes being able to learn new songs extremely important, is territory.



singing yours creates a ripple

effect: birds in a larger area develop similar repertoires, a local accent. The closer two birds live to one another, the more similar their repertoires. The further apart, the more different.

Established birds in the area have had the time to learn the regional bundle of songs by heart. This way, identification of birds that have long been living in the area is possible.

But, how is this of use, one might ask? Well, all birds that have established their territories in an area already have had their energy consuming conflicts with neighbours. These are the birds with a big and similar repertoire and are the least threatening to the stability of other territories, and thus are less likely to cause future conflicts. Young birds, whether they are from the neighbourhood or not, can be easily identified as a threat due to the lack of repertoire. The local bundle comes into play to quickly notice new adult birds seeking to carve out a new territory.

If a newcomer gets a chance to take a part of a locals hard-fought territory, or part of a their neighbour’s, the newcomer could try to squeeze in and expand upon their brand new territory. If the newcomer is to succeed the borders need to be rewritten and a cascade of many new territorial conflicts could start. Scaring the newcomer away as soon as possible can prevent a lot of future trouble. To summarise, maintaining a local repertoire of songs can help local bird communities have more stable borders and thus prevent conflict.

**BOB MARLEY**

THREE LITTLE BIRDS  
PITCH BY MY DOORSTEP  
SINGIN’ SWEET SONGS  
OF MELODIES PURE AND TRUE





# MARIT'S MYTHBUSTERS



## WATERMELON SUGAR HIGH

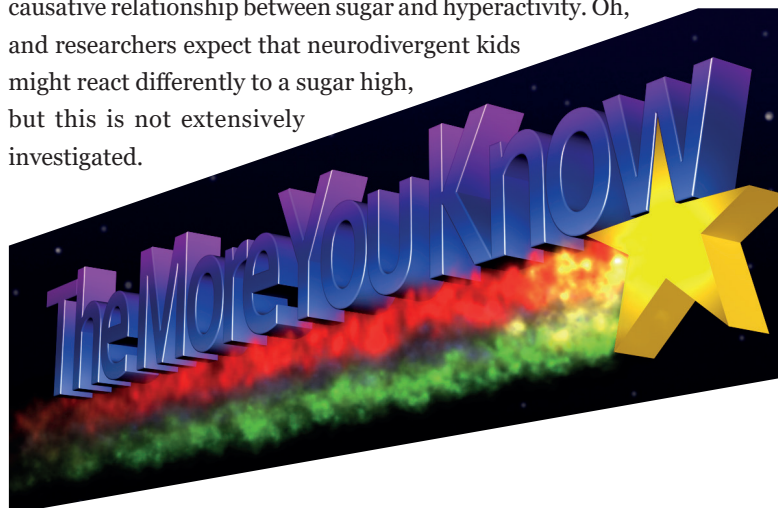
*They say knowledge is power, but what if this knowledge is total nonsense? When you fall on your tailbone, you won't get blind and when you get a jellyfish sting, please don't pee on it. You will be surprised how many biological misconceptions have rooted in your mind and that of others. In our new rubric 'Marit's Mythbusters', I will debunk common myths that many of you believe are true.*

### SUGAR CAUSES HYPERACTIVITY IN KIDS

A birthday. The Walhalla for kids. Jumping your heart out on the bounce house and sweets, cake, sodas, and other delicacies in abundance. All your friends, cousins, and siblings are gathered to play games of tag or hide-and-seek until eternity! The rush of the adrenaline, the energy that needs to be set free: it's a wonderful feeling. At least, from the perspective of 5-year-old you. Because, somewhere at that party, in the shadows, hides The Parent™. With their lurking eyes and judging glances, a kid only knows what's next to come. 'You know this is your last glass of soda', '[name], you cannot get more cake!', and the most party-pooing of all: 'Try to be calm and behave, for heaven's sake!'

It is a disappointing spectacle. While parties are supposed to be fun, active, and social, The Parent™ wants you to behave! To tame you, hold you back! And why? Because sugar 'supposedly' makes one hyperactive? Lifeline calls bullshit. Fortunately for all these

cute little kids, science is in favor of Lifeline and does not support the stubborn theory that sugar causes kids to act hyper. Even with all the sugar rushing through their veins, the islets of Langerhans working their butts off, double-blind studies show that there is no difference in observed activity between groups of children that were on a diet containing either predominantly sucrose (sugar), aspartame (artificial sweetener), or saccharin (sweet substance, presumably no effect on activity). It is important to note that this was not just one study, but several others did not find a causative relationship between sugar and hyperactivity. Oh, and researchers expect that neurodivergent kids might react differently to a sugar high, but this is not extensively investigated.



The persistence of the theory makes sense though, as sugar is shown to influence something else: the parent's perception of their child's behavior. In a placebo study, none of the participating children received sugar beforehand. However, some mothers were told that their kid did consume a large number of sweets. When the mothers were told to rate the activity and behavior of the children, the moms who thought their kid ate sugar also believed they were more hyperactive. Another reason this common belief is so common is the coincidence of sweets and busy events. Let's go back to the birthday for this one. As said before, friends, cousins, siblings, etcetera, are present at these events, which is basically paradise for these children. So many stimuli, so many peers, is what truly has an effect on the activity of kids. The fact that these events often include the high consumption of sugar, which creates the idea of causation in the eyes of The Parent™, is a true coincidence.

So next time you are living the dream of your younger self, do not let your parents tell you that you cannot eat too much sugar because it makes you hyper. It simply isn't true! Go enjoy that cake, jump that bounce house, and live your sweetest life.





# BIG GIRL YOU ARE BEAUTIFUL

## "WE LIVE IN A FATPHOBIC SOCIETY"



By Roos Slijfer

Nowadays there is a lot of information available: TikTok, fitness guru's and self-called personal trainers are easily accessible for everyone. This information can sometimes be misleading, which causes difficulty in a new pandemic: being overweight and obese. With our modern diet and sedentary lifestyle, the prevalence of obesity is on a rise, measured by BMI. However, BMI is not a perfect measure for being overweight, as it may not be accurate for most people. BMI can be a good assessment of body fat, being overweight, and health risk but may not be accurate for those who are muscular, of short stature, or elderly. For instance, someone who is 5 feet 10 inches and 220 pounds with 12% body fat would be considered obese based on BMI standards. Obviously, someone with 12% body fat is not obese, which gives a good example that the scale is not always representative of how healthy you are. A number is not always correct!



If you believe TikTok and its fitness guru's, we just need to eat less and move more to fight this new pandemic. Easy right? However Liesbeth van Rossum has another view on this. I strongly recommend looking her up on YouTube and watching her talk about the obesity epidemic. She explains that it is all way more complex than just eating less and moving more to fight the obesity epidemic. Food intake and activity are only a small part of why someone might be obese. The environment of a person plays a much larger role in their health. For example, the global population is currently suffering from an epidemic of obesity and malnutrition at the same time. The climate crisis has led to severe difficulties in cultivating food, which has hiked up prices of healthy food, making it inaccessible for people. On the other hand, unhealthy fast-food chains that offer quick and cheap alternatives to people, filled the gap between healthy and affordable food. Simultaneously, work culture has significantly

worsened across the world, which makes it difficult to find time and motivation to exercise; a lack of green space in cities also contributes to this.

With recent body positivity and body neutrality movements taking root, it is becoming increasingly clear to people that being outwardly fatphobic is not an acceptable way to be. This, in turn, has given rise to a more subtle form of fat-correction: concern trolling. For people who are fat, this manifests in people commenting on their appearance or giving them fat-correcting advice under the guise of concern, and a majority of this seemingly well-intentioned (it's not) and exclusive advice assumes that being fat absolutely means being unhealthy which is, incidentally, 100% false. Multiple studies found that being healthy is not directly linked to how heavy someone is. You can be overweight but still be fitter than someone who is skinny. A healthy, balanced diet and regular exercise are good for everyone, but unwarranted recommendations and uninformed concerns are not.

I think that what I want to say with this article is that being fat, overweight, or obese does not mean you are unhealthy. It is way more complex than that and the most important thing about a person is that they are happy.



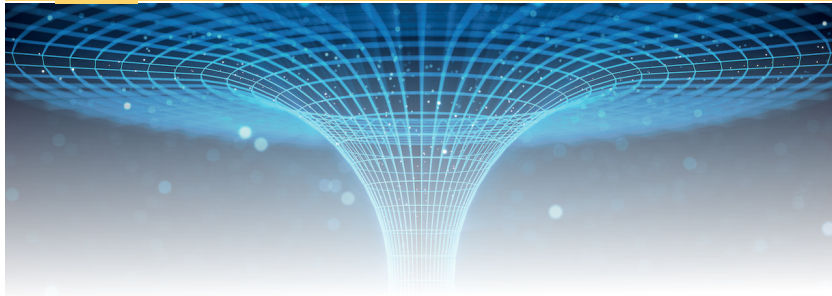




# FUTURE NOSTALGIA



By Chay Wessels



Don't  
y o u  
sometimes wish  
you could experience the  
Regency period and live your  
Bridgerton life, or go back to the time  
when all you had to worry about was who to call  
for your next playdate instead of tinder date? If only  
we could time travel... There are many movies about time  
traveling that make it seem like a piece of cake but most of them  
travel to the future. Is it actually possible for us to go back in time?

In 1905, Albert Einstein published an article about spacetime and sadly concluded that time-traveling could only be possible if we found a way to travel faster than the speed of light. And the chances that that will ever happen are as low as buying a house in your 20s. In 1916 Einstein published his General Theory of Relativity which is the basis for everything we know about time and space and he realized that the two are tightly connected. The place of an event, let's say the moment you became beer pong champion of GLV Idun, is determined by 3 dimensions of space and one dimension of time which together are called 'spacetime'. This basically means that the time assigned to an event by different observers will be the same if the observers are not moving relatively from each other. Einstein proposed that spacetime is distorted by matter and energy and they observed that the apparent position of a star changes

a little during a solar eclipse. The sun's massive  
energy and mass bend the lightwaves and  
thereby changes the position of the  
star from our perspective.

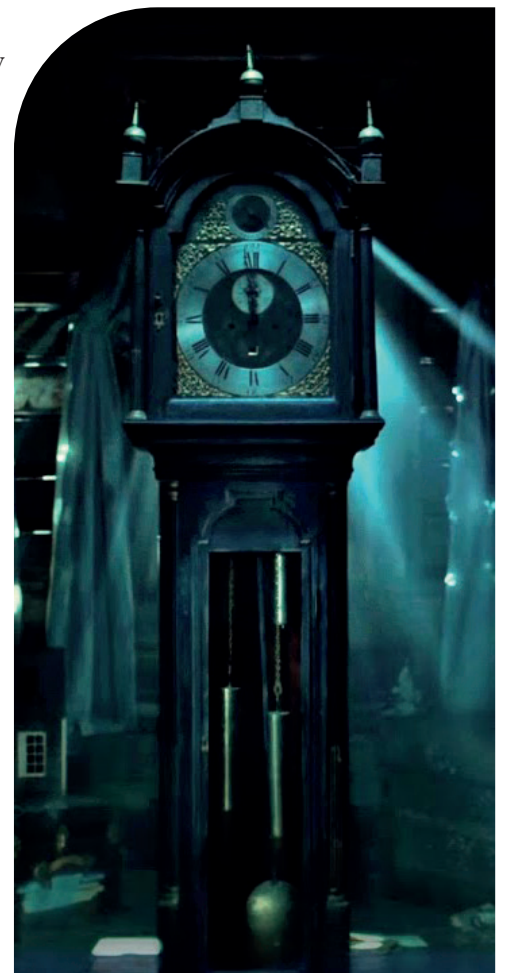
So the question  
actually is:

***"Can we bend spacetime in such a  
way that we can go back in time?"***

The cosmic string theory by J. Richard Gott suggests that two cosmic strings move past each other with a velocity very close to the speed of light. As their name implies, they are very long and thin strings with a huge amount of energy and mass and therefore can cause frame dragging. It is possible for a spaceship to travel across the cosmic strings and arrive back at its starting position, but it can only go back as far in time as when the cosmic strings first got into the right position. Though, the power needed for the spaceship to travel at the speed of light is infinite. This called for another theory that bends spacetime so strongly that a small tunnel with 2 separate endpoints in spacetime arises. They are called wormholes and allow for travel to the other side of the milky way in only a couple of weeks. However, this theory requires matter with a negative mass and energy density to reshape spacetime in the opposite direction. According to the classical laws of physics, this is not possible, but luckily Niels Bohr and Max Planck came up with the Quantum Theory which does allow for negative energy density and therefore could bend spacetime in a negative direction.

Unfortunately, these are all just theories for now.  
Research into time-traveling

is scarce as subsidy  
applications are usually  
immediately rejected  
since no government  
wants to spend  
money on something  
so controversial. Or  
could they be hiding  
something? If science  
and technology keep  
improving it could  
thus be possible that  
we can travel through  
space and time, or  
both, and let's hope  
that the chronology  
of events is protected  
because who knows  
what will happen  
otherwise...

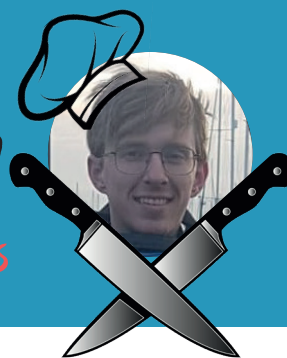






# Mastering student cooking

## with Koen Freerks



Yo

***His pans are clean, plates are empty, kitchen is ready***

***There's veggies on his counter already, mom's spaghetti***

***You better lose yourself in this recipe, the moment***

***You eat it, you better finish your bowl!***

***You only get one shot, do not miss your chance to cook this***

***This opportunity comes once in the Lifeline!***

In my opinion, spaghetti with red sauce is the ultimate comfort food. It reminds me of the long summers back when I was still a little kid. Having endless fun with my friends on the playground and in the local forest. I knew playtime was almost over when I started smelling my mom's spaghetti! Especially Bolognese-style pasta was a true treat! However, this dish is usually made with meat. Well, now it is time for a different version. Red sauce spaghetti with vegetarian meatballs! You can buy vegetarian meatballs in any local supermarket. A big plus is that they are also cheap as hell! And they are available in many different flavours. Enjoy cooking this and feel free to make changes to the recipe. Pasta can be made in lots of ways.



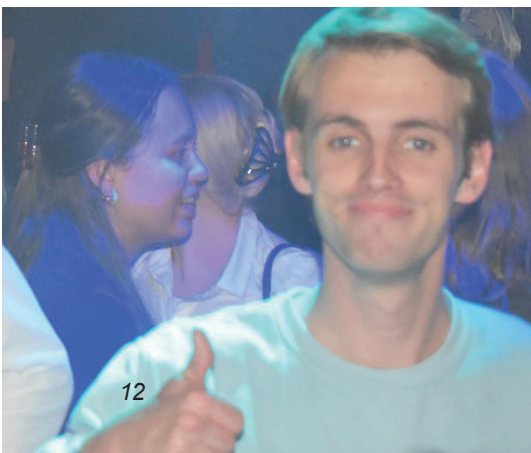
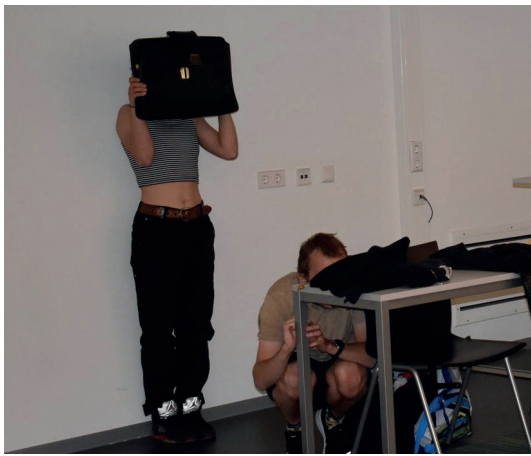
### INGREDIENTS (FOR 4):

- 320 grams of pasta of your choice
- 1 onion
- 2 garlic cloves
- 1 carrot
- 1 red bell pepper
- 1 zucchini
- 250 grams mushrooms
- 400 grams diced tomatoes (1 can)
- 1 tablespoon tomato puree
- 1 vegetable stock cube
- 250 grams of vegetarian meatballs
- Italian herbs
- Parmesan cheese
- salt
- pepper
- olive oil
- 1 handful of fresh basil

### HOW TO MAKE:

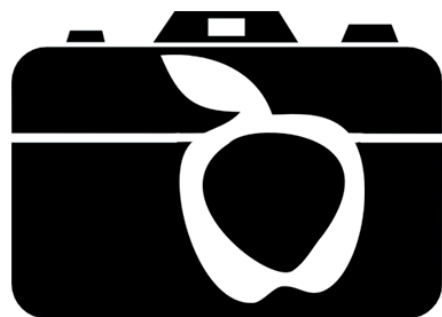
1. Cook the pasta according to the directions on the package. I assume about 80 grams of pasta per adult.
2. Peel and chop the onion, finely chop the garlic, and peel and chop the carrot. Heat a little olive oil in a frying pan. Fry the onion, garlic, and carrot for about 5 minutes.
3. Cut the bell pepper, zucchini, and mushrooms into pieces and add to the onion-root mixture. Cook until the vegetables are tender. I prefer there to be a bite!
4. Add the diced tomatoes and tomato paste. Add the stock cube and simmer for about 5 minutes to allow the flavours of the vegetables to soak into the tomatoes. Season the sauce with Italian herbs, salt, and pepper to taste. You can sweeten the sauce with a teaspoon of sugar if desired. You can also puree the sauce!
5. Heat some olive oil in (another) frying pan. Fry the meatballs until they are golden brown. This takes about 5 minutes. Now add the meatballs to the sauce!
6. Spoon the pasta and sauce with balls on a plate and garnish with fresh basil and Parmesan cheese. Ready to serve!





Lifeline









# TINY DANCER



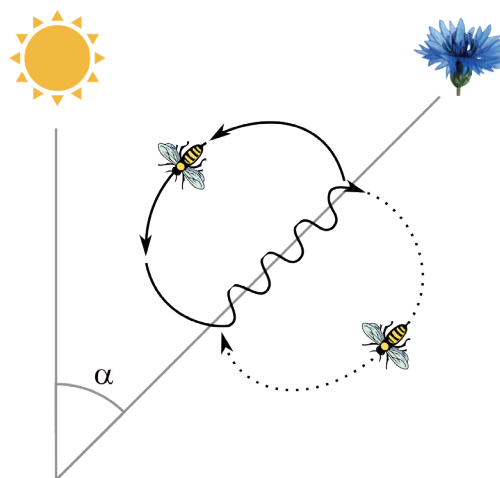
By Lisanne Leenheer

The intriguing behaviour of honeybees has fascinated many biologists, including Karl Von Frisch, who was the first to describe a particularly interesting phenomenon: bee dances. He observed that soon after a foraging bee found a new food source, many others would arrive at the same location. How was it possible that these bees, who had no previous knowledge about this new source, suddenly knew exactly where to go? Could it be possible that these little insects were able to communicate? To answer these questions, Von Frisch conducted a series of experiments in which he observed bee behaviour after manipulating the location of food sources. He noticed that bees, after finding a new food source, would fly back to their hive to waggle about excitedly. He later named this the waggle dance.

During a waggle dance, bees move in the shape of a figure eight on a vertical wall of their hive. They start with a straight line, followed by a semicircle, then another straight line and a second semicircle in the opposite direction. Through multiple experiments, for which he earned the Nobel Prize in 1973, Karl Von Frisch discovered that this dance was a sort of language for bees. He found that bees returning from one feeding source danced in a different orientation when compared to the dances of bees who had found food at another location. Incredibly, this difference in orientation turned out to match the difference between the angles of the hive and the two feeding locations. It became clear that bees are able to communicate with each other through their dances.

Through further experimentation, more details about the 'grammar' of this dance-language were uncovered. For example, moving in an upward direction (directly away from gravity) has been found to signify the location of the sun. The angle in which a bee dances, compared to this upward direction, corresponds to the angle in which they should fly away from the sun to find the food. So, when a bee directs its dance towards the ground, this lets others know they'll find flowers if they fly away from the sun. Honeybees are able to see ultraviolet and polarized light, which allows them to determine the location of the sun at any time, even on cloudy days. Incredibly, as the day goes by, bees can even use their fine-tuned

internal clock to change their dancing angle and correct for the movement of the sun across the sky. The duration of the wagging part of the dance also contains important information; a longer waggle indicates that the food is further away.



*The angle in which a bee has to fly away from the sun to find the food source, is the same angle in which a bee dances in its hive (compared to the upward direction).*

Although the waggle-dance communication system has been shown to reliably convey information about the direction and distance of food, the dance on its own is often not sufficient to allow bees to locate a new food source precisely. Further experiments have demonstrated that once bees arrive in the general area indicated by a dance, they will use odour cues to find the food. Still, it seems that we can safely say that these tiny dancers are the dancing queens of the animal kingdom.

## DID YOU KNOW...?

The work of Karl Von Frisch remains relevant today. For example, by decoding and comparing waggle dances from hives in agricultural and rural areas, scientists were recently able to conclude that bees in agricultural areas have more difficulty finding food.





# OCTOPUS'S GARDEN



By Nadia van Eekelen



*"I'D LIKE TO BE UNDER THE SEA. IN AN OCTOPUS'S GARDEN IN THE SHADE. HE'D LET US IN, KNOWS WHERE WE'VE BEEN. IN HIS OCTOPUS'S GARDEN IN THE SHADE.."*

Back in 1968, Ringo Starr wrote this song after being on a boat and thinking how tranquil it would be to just live in the calm waters amongst your friends. While I sympathize a lot with that feeling and sometimes think the same, my work on cephalopods the last few months has taught me they would never just let you into their garden. Octopuses are mostly asocial and solitary species. Even in the documentary 'My Octopus Teacher', it took weeks of daily visits before the octopus stretched out one of her arms to touch the diver.

However, octopuses can get very cuddly with strangers... under the influence of MDMA. Yes, you read that right. A study in 2018 has shown that the psychoactive drug, also known as ecstasy and molly, has the same effect on octopuses as on people. You would think that the brains of octopuses act entirely different than that of humans, given that our closest relative dates back to more than 500 million years ago and we evolved along completely separate paths. But this study shows that we might not be so different after all.

A few years ago, when scientists sequenced the full genome of the California two-spot octopus, they found that octopuses and humans have almost identical genes that encode a serotonin transporter. This transporter is known to be the binding site of MDMA. The drug essentially causes a huge flood of serotonin into the brain, causing feelings of friendliness and a desire to socialize. They wondered what the effect would be in a typically unfriendly animal and decided to give the drug to octopuses, to see if it would have the same heart-eyed effect on them as on people. Not just for fun though; the biggest goal of the study was to find the missing pieces in understanding the role of serotonin in social behaviours.

The octopuses were placed in diluted MDMA, which they absorbed through their gills. The experiment was performed in a tank with three connected chambers: one empty, one with a plastic action figure of Chewbacca, and one with another octopus in a cage. The other octopus was placed in a cage, as it is known that octopuses often approach each other with aggression, sometimes to the point of cannibalism.

Under normal circumstances (without MDMA), the octopus would stay far away from the other octopus in the cage. Inanimate objects, like the Chewbacca figure, were much more interesting. But give them some drugs and this behaviour totally changes into a relaxed and friendly state. The tripping octopus would approach and hug the cage with the other octopus. The octopuses would even be very playful, doing some water acrobatics, floating around with all eight arms spread wide or be totally distracted by the bubbles in the aquarium. These all seem to be parallel with the euphoria that people experience when taking MDMA.

Even though the results should be taken with a grain of salt, because the behavioural design had many flaws, the octopuses' raver-like behaviour could give us some new insights. The findings of the study suggest that basic brain chemicals might be the key to social behaviours across a wide range of species. Even though our brain anatomies do not resemble each other in the slightest, the octopus could help us understand complex social behaviour. Possibly, they could even help us to treat some social disorders, for which serotonin is used as a therapeutic treatment.







# MEMES

YES AGAIN  
WE KNOW U LIKE IT



By Rufus HoL

The ending on every 80's song :



Delete the song from the playlist

Keep the song but skip it every time it plays

My friend: How can you like music without liking a certain genre?

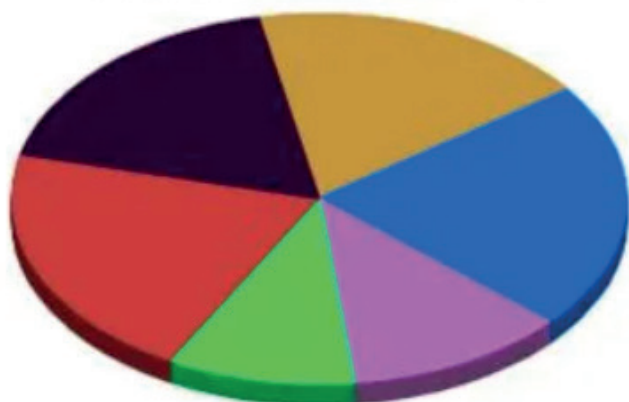
Me:



Rihanna all the time:



## Things Rick Astley Would Never Do



- give you up
- let you down
- run around and desert you
- make you cry
- say goodbye
- tell a lie and hurt you





# NO HARD FEELINGS (FORGIVENESS)



By Lauren  
Hansen-Manguikian

I once met a song that made me cry - every time I heard it. A song so deeply emotional that it became one of The Avett Brothers most popular songs - despite being so intensely sad. Yet somehow happy at the same time. It starts like this:

*When my body won't hold me anymore,  
and it finally sets me free,  
will I be ready?*

*When I lay down my fears,  
my hopes and my doubts,  
the rings on my fingers  
and the keys to my house,  
with no hard feelings.*

This song means a lot to me because I do actually, have a lot of hard feelings. Most prominently towards my mother, who spent my whole childhood reminding me every day that I was a useless piece of shit and cost her so much money and never did enough for her. This is a complicated story, as every child's relationship with their parent is, but I don't want to write a whole article about that. I just want to give context for why this song means so much to me yet confuses the crap out of my analytical brain.

What interests me most for analysis is the chorus:  
(Referring to the hard feelings)

*Lord knows they haven't done  
Much good for anyone  
Kept me afraid and cold  
With so much to have and hold*

See, I may study neuroscience now but at heart I'm an evolutionary biologist. I don't believe any emotion would evolve and persist in the population without being useful, which includes 'hard feelings'. Hard feelings can encompass hate, bitterness, resentment, and a myriad of other negative emotions associated with past harm someone did to you.

Why might we have evolved to harbor these hard feelings? When someone harms you, we remember that event, but also encode a negative feeling with that memory. Hence a hard feeling is born. We become more likely to avoid that person and less likely to be harmed again. So can it really be true that hard feelings 'Haven't done much good for anyone'?

Even more evidence for the utility of hard feelings comes from game theory. Maybe you've heard of the prisoner's dilemma - in which two people have the option to cooperate or take advantage of the other. In this situation, there is a strong incentive to screw the other person over. A repeated version of this game is played to see which strategy is actually optimal in the long run. In 1980, Anatol Rapoport submitted the simplest but clearly winning strategy "tit-for-tat": always start with cooperating, but if the other person screws you over, then don't cooperate with them again. If this is the winning strategy, our emotions are the mechanism allowing us to execute this strategy without even knowing it. Those 'hard feelings' are the repelling force telling us not to cooperate with that person again.

The next part of the song "kept me afraid and cold" is poignant. This is exactly what hard feelings do! They keep one afraid of the person who did that action. It's like carrying a little piece of negativity around with you (the memory of the past harm and fear it will happen again), in exchange for the lowered likelihood that the negative event will happen again.

Finally, the last line: "with so much to have and hold." We have a lot to be grateful for. Holding onto the negativity can prevent us from realizing how good we have it. It can prevent us from appreciating the people around us, despite their flaws and times they may have hurt us.



Why do I like this song so much still? Even though I think it's just evolutionarily incorrect? Maybe it's true we should strive for pure forgiveness, maybe it's also true that my current hard feelings save me from future harm. Maybe the pain they bring me is worth it, maybe it's not. In the general population, this trait persists because it is successful. It keeps us alive. But in each individual case we get to choose. Are your hard feelings providing you with protection from harm? Or are you just carrying around an old evolutionary rule which may not be optimally applied in this case? That's a question I keep returning to.



# WHY'D YOU ONLY CALL ME WHEN YOU'RE HIGH?



By Anette Hallik

Have you ever wanted to text someone special but been too scared and anxious to do that? And only after a few drinks you have the bravery to do it? Or been to a karaoke bar, where singing seems the last thing you would do, but one way or another, when alcohol concentration reaches a certain level, there you go, on the stage, singing your heart out to ABBA and Celine Dion. The culprit behind all that, the need for the help of alcohol or other substances, is something we all are familiar with - performance anxiety.

Performance anxiety is most commonly associated with performing in front of a large audience, but in reality performance anxiety can surface before any activity that one is terrified to perform. It is a normal occurrence in every person's life, but in extreme cases, performance anxiety can contribute to very serious anxiety disorders that will interfere with everyday life. Perfectionists often experience more performance anxiety as their desired level of performing a task is impossibly high. Further, low self-esteem also increases the levels of the anxiety.

Usually, our prefrontal cortex is subdued while performing routine tasks, the things we can already do and have practiced. It is the brain region responsible for decision making and paying attention. During an episode of performance anxiety the prefrontal cortex starts working at full speed, interfering with the parts of the brain that try to perform the well-known task, leading to interruptions in the activity.

Severe cases of performance anxiety occur in athletes before an important competition, in performers before going on stage, or in every one of us before a phone call, exam, a presentation, or a hookup with someone you have not met before. The worst

part about performance anxiety is that it actually lowers one's ability to perform the task ahead. Basically, we are fooled by our own brain. We think that we cannot (whilst we actually can perfectly well) perform a task, convincing our body that we cannot do that, resulting in actually underperforming. It can be divided into social and motor performance anxiety, depending on if it paralyzes your body or mind, but on the principle level they are the same, performance of a task is interrupted by anxiety. Once you don't perform as well as you wanted, you convince yourself even further that you, indeed, couldn't do it, resulting in greater anxiety next time around.

How is one supposed to show their actual skills when a little annoying brain bug fucks it up anyways? As performance anxiety is very common, there, of course, are many different ways of coping with it, depending on what type of person you are. Maybe this will give you some insights about yourself.

People with active performance anxiety spend a lot of time perfecting what it is they're doing. They can prepare forever, trying to minimize the chance of failure, spending hours of time and energy. On the other hand people with passive performance anxiety will just do anything to postpone or ignore the task ahead. Therefore, the same anxiety can lead to two very different results.

Sadly, it is not possible to never have performance anxiety, but it is possible to make the experiences as rare as possible. Working on one's self confidence and self-awareness leads to a more realistic sense of one's abilities and skills, leading to less stress before stressful tasks. So stress less, know your limits and love yourself to overcome the stupid performance anxiety brain bug.







# WILDEST DREAMS



By Cecile Bruil



and they all show that there is a positive correlation between the frequency of dreams shared and the intimacy of the relationship. Especially men believe that the sharing of a dream can lead to an improved relationship. But in order to tell someone about your dream, you must first, of course, remember it. This is proven to be a more difficult task for men than women, hence why women share more of their dreams than men do. And if you remember perfectly fine what you dreamed last night, you have a choice to make. To share or not to share. Based on the person you are accompanied by and the content of the dream, you might decide to keep the fictional storytime for yourself. Since the thoughts we suppress the most in our daily lives are likely to become dream content, we might opt to keep them for ourselves as a form of self-protection. Though, if you find your dream to be shareable, it depends on the people you are surrounded with to decide if you are to share your dream. It is found that non-singles mainly share their dreams with their partner and that singles mainly share them with their closest friends. This comes down to: you share your dream with whomever you are close to, which makes you become even closer, which makes you more likely to share more dreams with that person, and the cycle continues.

Let me tell you what I dreamed last night. I was at home, though, the floorplan was all switched up and didn't look like my home anymore. The two adult cats I own were returned to their 6-week-old kitten self and they were playing and meowing as kittens do. I petted them and every time I turned around, more kittens appeared. Dozens of cute little fluffy kittens were running around the living room. It was the loveliest chaos that I have ever seen, yet, it was just a dream.

But WHY do we feel the need to tell others about what we dreamed of last night? The whimsical, embarrassing, scared to death, straight-up weird or heated dreams. Chances are that you have shared a dream or two in your life with someone. Your mother, best friend, or lover, probably know a little fictional story about you from when you were fast asleep. And you are not the only one who has told a loved one the details of last night's dream. It is part of our everyday communication. Even though it is mainly told for good fun and entertainment, the sharing of dreams brings us closer together. Many case studies and questionnaires have been performed

Even though we never actually experienced the fantastic dreams we had, we must not take the impact of sharing them for granted. So next time, please tell the people you like about your wildest dreams, it might just bring you closer together ;)



# KARAOKE

Lifeline has had some pretty abstract themes (looking at you, ‘F’), so you can imagine that the topic of our review is not always straightforward. Thank goodness this theme was an exception. How could we review something other than karaoke songs?! As scientists in the making, we of course practically tested as many songs as possible, so you can pick the absolute perfect karaoke song! So we gathered our Lifeline family, some liquid courage (tequila), and went to ‘The End’ karaoke bar in the Gelkingestraat to sing our lungs out!

First of all: what a vibe there. I could literally come up with the most random songs and somehow their songbible, as thick as my hand, contained them all. Thus, when your friend group has veeery contrasting music tastes, there is still something for everyone! Also, no songs with Dutch lyrics are featured, so internationals cannot only sing along to everything but also enjoy listening to them! We love that. The stairs to the bathroom are a little tricky when drunk though. Cecile and Lauren recommend asking the bartender to sing Castle on the Hill by Ed Sheeran, because, boi, that was a private concert!!! So pure! So clean! Douze points.



Enough said. Onto the songs! Our lovely seccie Anette created a list of literally every song being sung and we composed a top five from those: Since U Been Gone (Kelly Clarkson), Unwritten (Natasha Bedingfield), Africa (Toto), Sweet Goodbyes (Krezip), and You’re The One That I Want (Olivia Newton-John and John Travolta). Ironically, Lifeline members did not sing any of these songs lol.

With a 6,8, Sweet Goodbyes by Krezip, is last but not least. The point, and a great proportion of the fun, is about singing along to songs you know. Therefore, no surprise that the Dutch origin of this song makes it not ideal for karaoke. Better opt for another! Sweet goodbyes is a good song, but does not really get the party started due to its low trashiness, which is kinda what you want with karaoke.

Fourth place. A surprise. I thought it would end first before we started this review, but everything else was true. Africa by Toto ends fourth with an average of 7,8. Again the low amount of trashiness is what prevents this song from rising to the top. Some argue it is also not very singable when tipsy, but yours truly argues that it does not contain hard rap parts!! (Looking at you Don’t cha). The crowd does get going with this song, which we experienced as well. Our audience consisted somehow mainly of daughters singing with their mothers? They vibed hard to Africa.

“  
**BEER HELPS WITH  
THE EXPERIENCE.  
ALSO, TEQUILA**

“  
**WHY ARE THEY  
YELLING?!?!**

Closely followed by Africa, it is You’re The One That I Want by Olivia Newton-John and John Travolta that ends third. With an average of 7,89, this Grease song clearly wins it at trashiness, scoring an almost perfect 10. You must be a little drunk to sing it, more than with the other songs, but this song sure gets the party going. Bonus points if you do the dance and wear a leather jacket.



# REVIEW



By Parit

Unwritten by Natasha Bedingfield. A well-deserved second place with an 8,32. No need to be drunk when singing this one! The high notes make it a little tricky to sing with a lot of tequila, but the fulfillment you get out of singing this song, 'no one else can feel it for you.' First place, ending with a total average of 8,84 is Since U Been Gone!! Now that I think about it, we did sing this one. It has great crowd involvement (seriously, who doesn't know this song?) and contains no unexpected rap parts like songs from Eminem and Pussycat Dolls (Ahum, we learned a good lesson that day). From experience, I must say that enthusiasm >>> singing skills with this song. Also, a pro of high crowd involvement is that you cannot hear yourself sing! #lifehack

All in all, we had a crazy fun night. Seriously, now that we selected the perfect songs for your karaoke adventure, jump into it. Niklas mentions that people need to sing in the microphone in order for the rest to hear them sing, and while that might be scary, I repeat that enthusiasm > singing skills. You can also throw in a little dance in there if you'd like, for example, when the rap part becomes too fast and you get confused by lyrics. Anyway, we hope you enjoyed this review and your next singing adventure! Don't forget to take pictures (or a lil' movie).

Lots of love, *Lifeline*

“  
YEAH LET'S  
NEVER DO  
EMINEM AGAIN



Song	Crowd involvement	Singability when tipsy	Catchiness	Drunkability	Trashiness	Average
Since U been gone <i>by Kelly Clarkson</i>	9.2	8.7	9.9	8.4	8	8.8
Unwritten <i>by Natasha Bedingfield</i>	8.9	6.7	9.5	9	7.5	8.3
Africa <i>By Toto</i>	8.8	7.1	8.9	8	6.2	7.8
Sweet Goodbyes <i>By Krezip</i>	6.8	6.5	7.5	7.8	5.4	6.8
You're the One that I want <i>by Grease</i>	8.1	7.3	7.5	6.8	9.8	7.9

# BAS EN Z'N BEESTJES

*Beasts by Bas*



*By Bas van Boekholt*

The animal kingdom is filled with singing animals. The obvious ones are of course birds but don't forget duetting gibbons, howling wolfs, whistling Indris, and chirping crickets. Every jungle is overflowing with a cacophony of creatures trying to be louder than their neighbours, so we humans are really not gifted when it comes to song production. There is, however, one thing that is special about the human song; our songs are cultural, meaning that we learn them from others and that they differ between populations. It was long thought that we were the only mammals capable of this; how egocentric! In this Bas en zijn beestjes I will introduce you to our chanting cousin, a vocalizing vertebrate and shanty singing sea creature; welcome to the wonderful world of whales!

Whales belong to the infraorder of Cetacea and evolved around 55 million years ago when a crocodile-like otter moved back to the water that it left 350 million years earlier. Whales make optimal use of the reduced gravity underwater growing into the giants as we know them today. Scientists predict that blue whales are the biggest animals that have ever lived on this planet! For comparison, the biggest dinosaur, Argentinosaurus, does not even weigh half the weight of an adult blue whale. On top of that, it's not just adults that weigh a lot! A new-born calf already weighs as much as an elephant and within its first few months, it manages to grow about 5 kilograms every hour. That means that if you would hypothetically eat one, and it would stay alive, it would grow faster than you could eat it! Whales are mammals, which means that mothers nurse their young. However, whales don't have lips and aren't able to suckle so instead a calf swims underneath its mother and she releases a cloud of toothpaste-like substance which is her milk. Sperm whales live in family groups where sisters babysit their little nephews and nieces, while their mother dives more than a kilometre deep to hunt for giant squids. Whales are not only big, but they also live very long. The bowhead whale is the record holder, with some individuals passing the 200 year mark.

As mentioned in the introduction, whales have their own special songs. Specifically, humpback whales are able to produce complex songs containing squeaks, squeals, roars, ratchets, and more that all fit together with their own grammatical structure. Because of the way sound travels through water and the low frequencies they sing in, some parts of the song can be picked up tens of thousands of kilometres away from the singer. Not every whale sings at the same frequency. There is one whale known as 52 blue, which we have been hearing since 1980 but never seen. This individual sings at the very unusual frequency of 52 Hz, which is so high that other whales cannot hear it. This earned

him the nickname "the world's loneliest whale". What makes these songs special is that they are culturally learned. Different individuals have their own dialect and the song changes depending on the area the whale is from, as well as what time of year it is. Scientists have been following one particular popular song that seems to have travelled through groups of whales copying the song of their neighbours from the eastern shores of Australia all the way across the southern Pacific Ocean to the coast of Chile.

Sperm whales are a little less cultured than their sisters and more or less shout instead of sing. However, this 'shout' is so powerful that they are able to stun giant squids, with it and it is the loudest noise ever known to be produced by an animal. Instead of shouting at their prey, humpback whales slap the water with their tail creating a shockwave that also stuns nearby fish. But if they really want to cast a line they work together to throw out a net. Not a net made of rope, but of bubbles! In the fjords of Norway, humpback whales will encircle a school of fish blowing bubbles out of their blowhole, slowly herding them all into one tight clump. Then they all surface simultaneously, devouring the whole school at once.

With around 40 species of whales out there I could easily go on for another few lifelines but everything has an end (even the body of a blue whale). I haven't even got to the part about the 13 stomachs of Baird's whale or the crazy tooth that forms the tusk of the narwhal (which means corpse whale in Icelandic) or the fact that we use whale "vomit" as an ingredient in perfume. So, whilst I'm not 100% sure they will fit, I am happy to accommodate whales in my hall of fame. To me, whales seem to be these mysterious creatures that roam the vast emptiness of our oceans, travelling thousands of miles across the deep blue sea. And who knows? Maybe they are not singing to find a mate or someone else, maybe they are just commenting on the world around them, throwing their opinions out there. If only we could really listen to them, what stories would they have to tell?





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# IDUZZLE...



By Juultje



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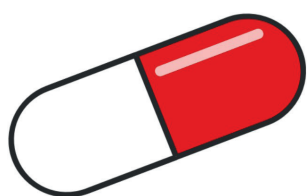
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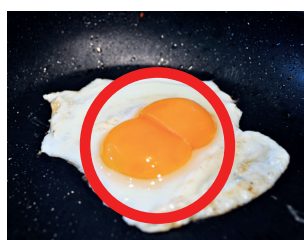


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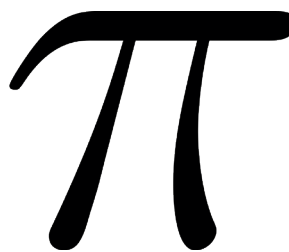
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20th letter  
of the  
alphabet



p=f

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The previous Iduzzle was won by **Andreea Ghiata**. Congratulations! They have won a marvelous prize, which they are very happy with! Would you like to be mentioned here in the next Lifeline? Please submit your answer to the Iduzzle to [redactie@idun.nl](mailto:redactie@idun.nl) before October 10<sup>th</sup>.

Answer to iduzzle 67: Try to be a rainbow in someone's cloud.

