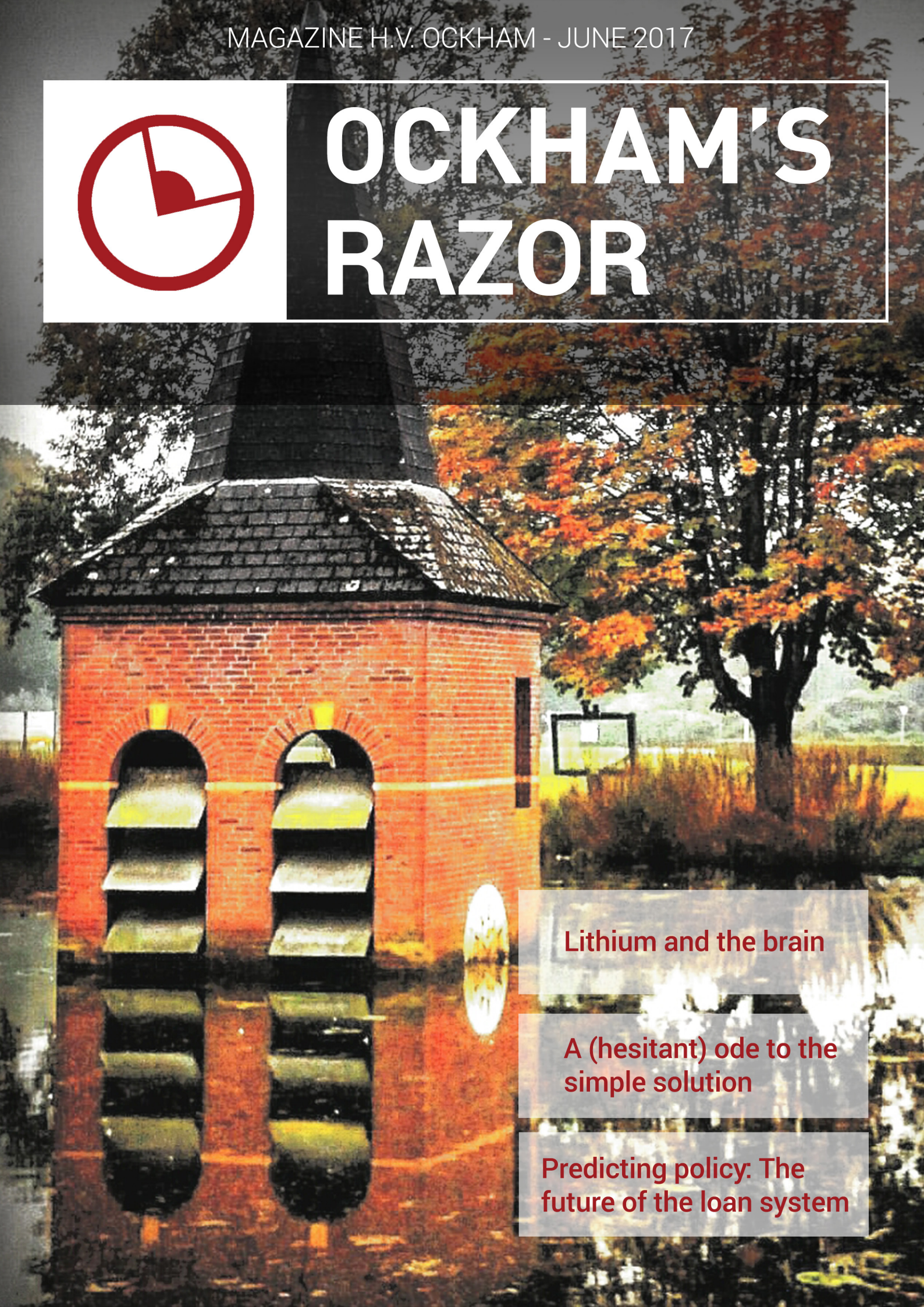
MAGAZINE H.V. OCKHAM - JUNE 2017

OCKHAM'S RAZOR



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Special thanks to:
Thijs Lieverse, Gert-Jan Hospers, Nelleke van Adrichem-Rotteveel

Cover photo courtesy of Saumitra Athlekar.

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FROM THE BOARD

Dear Reader,

Summer is fast approaching, which also means that our study year is coming to an end. We as a board look back to a wonderful year together with you. We are happy to have a very enthusiastic candidate board, who will surely keep H.V. Ockham a wonderful place for all of us in the coming year.

Over the past few months, we had some very interesting activities, where we uncovered the mysteries of LinkedIn and learned about the Internet of Things 2.0. We also had a ton of fun with our monthly drinks and activities like pooling. Stocking our bellies full after the Batavierenrace was completely deserved seeing the amazing performance of our Ockhamsters on sOckkies!

We as a board were also busy with choosing the new candidate board. I'm happy to say that we all are extremely happy with the new candidate board members and the enthusiasm they have for Ockham. I hope you have already met them, if you didn't yet, I encourage you to meet these wonderful people.

I would like to finish with some words of gratitude for all of you. We as a board have had a terrific year. Not only did we learn a ton, we have met new people and are happy to say that together with you, we have been working to keep this wonderful association a home for all honours students. On behalf of the whole board of Ockham, thank you for an amazing year, and we hope to see you again after the holidays!

Kind Regards,

Thijs Lieverse
Chairman of H.V. Ockham

EDITOR'S LETTER

Dear Reader,

Currently, you are reading the second edition of Ockham's razor of 2016-2017. We are proud to be able to present you this magazine. We have tried our best to bring you everything you want to know about our association, H.V. Ockham, and more! This edition you are informed about activities that have been done during the second half of the year. Besides that you can be amazed by some science news on the origin of life and the relativity of our senses.

You can enjoy an interview with Gert-Jan Hospers, the professor teaching the design synthesis module. Find out what his view is on the programme and how he contributes. Futhermore, Nelleke van Adrichem-Rotteveel will introduce herself as member of the Honours Bureau.

Of course, this edition also has several columns. There topics reach from the difficulties of having a laundry machine repaired to the difficulties of forming a new coalition after the Dutch elections.

And we should not forget the content articles written by our editors. Read about Hack(ables) to satisfy your technical hunger for information or dive into the topic of lithium and the brain to quench your thirst for biomedical information.

All in all, this edition is packed with interesting articles and information about our association. We hope you enjoy reading this magazine!

Leon Smook
Editor in Chief

Hackables

By Martin Essink

Every now and then digital data is stolen, or another crypto locker wakes up the world about the dangers that modern electronics can bring. In this case, we often write about 'hackers', but the word 'computer criminal' might be more appropriate for these people. Any word that contains 'hack' is often associated with illegal practices, computer crime to be more exact. Hackers however, can be much more than just criminals. Per the dictionary, a hack can be described by 'altering' or 'gaining access to', and as you can see there is no mention of the word illegal. This is because hacking is in many cases perfectly legal.

In short, hacking can be described as an activity where one tries to overcome the limitations of technology, such that it can be altered or used for alternative purposes. This holds for computers, where jailbreaking an iPhone is considered hacking, but it can also be done using everyday objects. It is quite often that an everyday object is very useful for tasks it was never made for. Did you know you could use your egg slicer for mushrooms for example?

If you remember from the previous edition of this magazine, I talked about the so-called software defined radio. Where software defined radio is not a technique that was invented by hackers, it is a technique that was made much more accessible by them. The devices used to receive radio signals used to be very expensive, until some person found out that an ordinary, cheap TV-Receiver could be used to intercept the same signals. By making a few software modifications, it was not only possible to receive TV signals, but also a whole lot more. Because of this, people gained access to great technology that again has made for some great uses of it. As I showed, there are sites like Flightradar24 that rely on this technology for most of their data.

Of course, hacking can also be described as 'gaining access to'. In that case, it can also be either physically or digitally. To start of physically, there are quite a lot of people that enjoy and practice on lock picking. They often do not do that to use it to break in to houses or steal cars, but there exist some that do. These people are often a valuable asset to either the manufacturers of locks, who will get feedback on how to make their locks even better, but also for companies. There are 'penetration testers', who are hired by companies to purposely break in to their places. This shows the companies where the problems in their security are. These people use a wide range of skills. Not only lock picking, but also social engineering is very important. Quite often the weakest part of security lies with the people. Many people can easily be manipulated to do what the attacker wants.

The digital world is almost analogous to the physical world. There are the good and the bad apples. Many people do their best to find vulnerabilities and report them to the companies that make the software. Larger companies, like Google and Facebook, offer rewards to people who disclose issues. Just as in the physical world, this helps to improve the security of all of us. Here, social engineering also plays an important role. Most of the viruses that spread, need some action from the user to become active, as the computer security is too strong. By tricking the user, this security can often be circumvented.

There is a lot of discussion about governments that also work to find security flaws, but do not disclose them to the corresponding companies. Not only agencies like the NSA do this, but also the Dutch police force is working on this. It can be argued that this is a good thing, as it will only be used to hack suspects to gather intel, and can only be done by a government controlled agency. On the other side, it brings many dangers. Not only do these security holes remain in the software, but can also be stolen. Recently a large set of hacking tools of the NSA was stolen, which we have seen used in Crypto locker viruses, with disastrous results. This shows us that security holes like that are not even safe in the safest hands, and that they might be better off fixed.

It is important that we become aware of the good work that is being done by a community of mostly volunteers. The work they do benefits all of us, and often goes unnoticed. If you do want to know more about what is being done, you could watch videos from conferences like Black Hat and DefCon, which can be found on YouTube.

Navigating the jungle

By Leon Smook

In my opinion our student time is a time to learn and explore. This includes life lessons we sometimes would rather not learn. Some time ago I had such a lesson, let me tell you about it.

On a random day of the week I received a WhatsApp message on our flat app-group. "Guys, the laundry machine broke down when I was doing laundry" So, there it was. A broken laundry machine in a student flat. And you know, students can be lazy and not at all proactive at times. So of course it took several days for someone to readdress the issue. A little later the receipt was made available to all flat members, so action could be taken. But still, fourteen students will keep waiting for someone else to take responsibility.

Another few days passed by. Dirty clothes were piling up in rooms and dishes were air dried due to unavailability of clean dish cloths. Still no one had picked up the responsibility. Finally, someone dared to bring it up again, of course with fear of their time. I thought, let's be responsible and contact the company we bought the machine from. So I wrote an email explaining the issue, included the client information and sent it.

A few days passed without any reply, so I went to the best search engine ever "Bing" and looked for the company, RedCoon. I found their website, and low and behold I immediately knew why there was no reply. The company went bankrupt about a year after we bought the machine! A major complication, and this is how I got caught up in the corporate jungle. The website directed me to an online company. So I swung to their customer service and explained the situation.

Of course, they did not know what exactly to do, so they referred me to Samsung, the maker of the laundry machine. I grabbed another phone line and reached for their customer service. Several moments later I was performing all cliché problem solving methods. I tried unplugging it and replugging it. But still it was broken. I ran a calibration run. Still no fix. So Samsung planned a home-service repair.

A few days later the repairman came and opened up the machine. Only to find he did not have the parts he needed. So another week passed by, the repairman came back and finally our laundry machine seems fixed. Now slowly our own jungle of dirty clothes is shrinking with the same rate as the Amazon rainforest!

Formation talks failed? I think not!

By Luuk Buunk

It was all over the news: VVD, CDA, D66 and GL were not successful in creating a new coalition. It was argued that the parties differed too much. However, with this column I would like to try to convince you that these talks are not fully over yet.

Let us first of all discuss the position of the VVD. In order for the VVD to get a sustainable majority coalition, it has to work together with a party located left of centre. The PvdA is certainly not going to join a coalition since it has lost so many seats. The socialist party and the animal party are opposites of the VVD, making them very unlikely to join a VVD-lead coalition. GL and CU are therefore the only options.

Then, CDA and D66. In a coalition VVD-CDA-D66-GL, VVD and GL are most likely to balance each other out, which means that most of the policies will be in line with the ideas of centrist parties like CDA and D66. By including CU instead of GL, CDA can strengthen its position, but D66 will never let that happen since that will deteriorate their position.

Lastly, GL. If a coalition VVD-CDA-D66-GL would be constructed, it would be the first time for GL to join a government. Their primary objective, fighting climate change, can finally reach the executive power.

This would mean that the only other option next to a VVD-CDA-D66-GL coalition is new elections, but the parties are hesitant towards new elections since they were the big winners of the election and are likely to lose seats if new elections take place. You might ask why the parties then stated that they were not able to form a coalition. The reason for that is very simple. The voters of the parties at the right and left part of the ideological spectrum differ substantially. Most of the voters will not like it if these parties would work together. Therefore the parties have to show that they do not 'sell their soul to the devil'. To show some muscle to their voters, they will try to find a new coalition partner, which is bound to fail due to the reasons stated above.

SCIENCE NEWS

Oldest evidence of life [1]

Scientists discovered 3.48 billion year old fossils in the Pilbara region of Western Australia. One of the indicators of bacterial life they found is empty bubbles in the ancients rocks which indicate microbial life. Before this discovery the oldest fossils were 2.7-2.9 billion-year-old deposits. This means that the new finds pushes back the origin of life by about 580 million years. But not only is life older as expected - it also gives us more information on where life first started. The find indicates that life might have started in hot springs on land. The other hypothesis often considered is that life started in hydrothermal vents in the deep see.

Machine learning creates more responsive prosthetics [2]

A bionic hand outfitted with a camera has been developed. This camera automatically captures the image of an object and decides what the best way is to pick it up. It does this by grouping the object based on size, shape and orientation. This decision process was created using machine learning. The advantage of this approach is that the hand can also pick up objects it has never seen before. One of the main barriers to artificial limbs has been that they felt slow and cumbersome compared to the original limb. The scientists hope that this new approach will help solve this problem.

Do I smell what you smell? [3]

Many people have heard of the problem: Is my color red the same as your color red? A similar question related to smell was recently answered. To investigate this researchers provided mice with water that had different smells. The researches showed that the olfactory system adapted to its environment. If a scent is present more often, more cells were created that could smell this particular scent. This means that some odors smell a lot stronger for those mice that have been exposed to it.

Battery and solar charging combined [4]

A team of researchers has developed a single-unit, photo-rechargeable, portable power source. Lithium ion batteries are printed directly on silicon power cells. To enable the connection between these two separate technologies they used an aluminum layer. This new technology inspires many futuristic thoughts. It might just be the road to lengthening the time needed between charging your battery. Or maybe in the future this will lead to devices that don't have to be plugged in the socket anymore.

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From the Honoursprogramme:

Nelleke van Adrichem-Rotteveel

I am the key strategist and coordinator of the bachelor and master honours programmes. My background is educational science, and my specialisation is organization and innovation of the curriculum, quality control and strategy. For a long time now, I work to put excellence and honours on the agenda of the UT.

More than a decade ago, nothing of this existed at our university. The typical Dutch saying "Just be normal, then you are mad enough" and "all our students are excellent" where statements we heard at our university a lot. One of the first initiatives I was involved in is the talent programme for students from secondary education to speed up their programme and experiencing with courses at the University. Therefore, I developed a convenant for secondary education. Another initiative at the beginning of Honours was the governments plan „Ruim baan voor talent" ('More room for talent'). For the University I was one of the co-authors to write a report to get funds for starting one of the first honours tracks of the UT. We managed to get funding for our ideas and started one of the bachelor honours tracks. Although I am very proud of these things, I am even more proud of the development of the honours in the master phase. Because there was now an offering in the bachelor phase, but nothing at all for master students. I developed, together with others, master honours Change Leaders and Research Honours, which are very successful programmes and are now permanently included in the total offer of the University. Especially in Research Honours, I got the chance to put many of my ideas about honours in practice. I am still the trainer of the workshop Creative Thinking and organizer of the Personal Pursuit in collaboration with the Young Academy at the University, the JA@UT.
What I notice is, that we have ended up in a new, other phase with honours at the UT. There are more people keeping an eye on honours, by having an ambition with honours and having an opinion about it. This is good for the quality and the overall support. In my opinion, honours has to be a bit more different than the regular programmes which are strictly regulated. Therefore, within the honours programme, more emphasis should be on educational freedom between teacher and student. Be mindful, the programme shouldn't be seen as 'anything goes'. It is important to keep in mind the challenging nature of the honours programme. In this framework I enjoy trying to develop new initiatives and to look at what works in honours. As I've mentioned before, I think it's very important to have choices in the programme, meaning you can organise and execute your own challenging projects, to have the ability to receive coaching in order to develop yourself, and to have opportunities for cooperative learning. Do not feel strange that there are others with the same drive, that you get more out of yourself than average, all while having a great time together.

The comparison between the honours programme and top-level sport is easily made. For sport talents it is also important to utilise talent through good, alternate training and often broadening training with different sports. If circumstances are optimal, many people will succeed in achieving an extraordinary performance. My ambition for honours is having an environment of enthusiasm, creativity and curiosity to discover new paths for students and teachers. Others call it "honours as an experimental garden". The latter, I think is a nice description for honours education, in other words:

'Let a hundred flowers bloom. I cordially contribute to that garden.'

Lithium and the Brain

by Saumitra Athlekar

Lithium, the third element of the periodic table, is mostly known for its use in batteries. However, in the form of various compounds, lithium has a surprising, important, and yet somewhat mysterious role in the field of medicine, specifically, in relation to mental health and the treatment of certain mental disorders. Lithium salts are used for this purpose, of which Lithium Carbonate (Li_2CO_3) is included in the World Health Organisation's Model List of Essential Medicines[1], which lists a variety of "efficacious, safe and cost-effective" medicines for a variety of health conditions, diseases and disorders.

Currently, lithium compounds are widely used as mood stabilisers, in treating treatment-resistant mood disorders like major depressive disorder, bipolar disorder, etc. as well as schizophrenia, and some other psychiatric disorders, especially in children. Lithium carbonate and lithium citrate are the most commonly used compounds, as most other lithium compounds, including its halides, are known to be toxic and have, hence, not been tested for pharmacological purposes. While the medical use of lithium is less-known, it is not some recent discovery, but has been studied for psychiatric treatment since decades, even though its mechanism is yet unknown.

The earliest recorded use of lithium as medication goes back to the mid-19th century, when lithium was used to treat patients with acute mania. A few decades later, it was found to have calming effects on patients showing 'psychotic excitement', so much so that the patients were capable of being released from psychiatric care and lead normal lives, after suffering from illness for years. The breakthrough in lithium treatment came much later, in the 1950s, in Risskov, Denmark, in an age when randomised controlled trials were gaining popularity in medical research. Mogens Schou, a staff psychiatrist at the Aarhus University psychiatric hospital conducted such trials on mania patients, and concluded that lithium was an effective alternative to the conventional treatments used in cases of bipolar disorder, as patients could be kept in stable state with the administration of a maintenance dose for extended periods of time.[2]

This study was crucial to the development of treatments for mood disorder, as this class of disorders was thus far governed by strong anti-depressants and barbiturates, which can have severe, ugly side-effects, and ECT (electro convulsive therapy), which due to its very nature (electrically inducing seizures in the brain) was, and still is, considered undesirable.

Since this study was published, the efficacy of lithium prophylaxis in bipolar disorder has been demonstrated and documented through several decades' worth of careful, peer-reviewed scientific studies. Bipolar disorder is a serious psychiatric disorder that causes unusual and drastic shifts in mood, with recurring episodes of mania and depression being common. A manic episode is characterised by elation, hyperactivity, agitation, irritability, combined with insomnia racing thoughts, and dangerously reckless behaviour, while a depressive episode is generally characterised by feelings of sadness or hopelessness or emptiness, lethargy, enervation, as well as shifts in sleep and food habits, difficulty concentrating, and suicidal thoughts or behaviour. Memory loss can be a characteristic of either episode, and both types of episodes can be debilitating, and can obstruct normal life.

Studies indicate that prophylactic lithium treatment can significantly affect the frequency or severity of such episodes. In some patients, the response is quick and future episodes are prevented completely. In most patients, the administration of lithium dampens future episodes, leading to patients having progressively less severe or less frequent episodes. With treatment for extended durations, the episodes may disappear altogether. It should be noted, however, that about one out of ten patients continue to experience manic or depressive episodes with unaffected frequency and severity after lithium treatment.

As impressive as the efficacy of lithium in treating bipolar disorder is, the most astonishing property of lithium lies in its anti-suicidal effect, a phenomenon that has not been reported for any other psychotropic compound. Numerous studies, meta-analyses and reviews indicate a positive association of reduced suicide risk with long-term use of lithium. One study found that the average crude rates of suicidal acts dropped from 2.64% per year without lithium treatment to 0.56% per year with lithium use, and similar results were found in studies for suicides and attempts, and with patients with various other mood disorders. Risks were also found to increase 20-fold within months of discontinuation of the treatment.[3] This has since been confirmed by various international studies.

Suicide is a grave public health problem worldwide, and is thought to be caused through the complex interaction of biological, genetic, psychological, social and environmental factors. However, the incidence of suicide in those suffering from psychiatric disorders, especially mood disorders, is rather high. In such cases, the preferred method is overdose of anti-depressants, hypnotics, etc. due to the easy availability of toxic quantities through prescription. This paradoxical situation is non-existent with the use of lithium, due to its fascinating anti-suicidal nature, which is remarkable, considering its inherent lethal toxicity in acute overdose. This, in itself, strengthens the position of lithium as one of the most ideal psychotropic drugs for the treatment of mental illness.

There has also been some speculation regarding the role of lithium in preventing suicides in the general public. Studies have been conducted to investigate the relationship between the levels of lithium in drinking water in specific areas and the mortality rates for suicide in those areas. Such studies were conducted in various parts of the world, and most confirm such a relationship. However, inferences drawn from them are purely speculative, as due to the very nature of suicide, explicating this relationship is a difficult task, mainly due to the extremely low amount of lithium present naturally in drinking water, and due to the lack of understanding of the mechanism of lithium in the brain.[4] Besides, the direct role of lithium in reducing suicide risk cannot be easily demonstrated, as testing and experimentation has been inhibited for a variety of reasons. It is thought that in patients, a reduced risk of suicide is the result of a reduced incidence of relapse, but additional mechanisms are now being considered.

In recent years, there has been a renewed interest in lithium due to a number of in vivo, in vitro and clinical studies pointing to lithium being neuroprotective; it prevents cell death due to apoptosis in the brain. In clinical studies, it is difficult to differentiate between the neurotropic and neuroprotective effects of lithium, but either way, the use of lithium measurably increases the volume of grey matter in the brain. This not only suggests a new mechanism of bipolar management, but may also have significant implications in preventing or treating brain damage caused by acute trauma, such as that from ischaemic stroke. Additionally, scientists are also looking into utilising this property of lithium for treating or preventing chronic or progressive neurodegenerative diseases, such as Alzheimer's disease and Huntington's disease.[5]

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A (hesitant) ode to the simple solution

by Marrit Schellekens

My mother taught me many useful things, but one piece of wisdom resonates stronger than ever before. ‘The question isn’t if we can make it, but if we should make it. Look at all the technology around us. Millions of dollars went into it. Yet I don’t believe humans are happier now than a hundred years ago.’ I study Creative Technology and can’t help but remember these words while seeing projects about a cup that indicates the warmth of the drink, smart fridges and a big screen that can be a replacement for a window. These projects seem to include technology for no other reason that that it is possible. They are over-engineered - a complex solution to a simple problem. Let me show you a different way.

Drones are a great new technology which finds new purposes every day. They are also a serious potential threat. They allow attacks from a distance and aren’t affected by regular security precautions. Just think of a drone spreading toxic gas over a football stadium. So how do you solve this? Jamming devices or missiles to shoot them out of the air? There is actually a much more elegant solution. They have been training eagles to take down drones. The French army is training these eagles in the following way: when the eagles are young they are actually using the drones as dinner plates. Of course, the first time the young eagles see a hovering drone it is taken down quite quickly.

Another beautiful analog solution is the plimsoll line. In the 1860s a lot of ships were lost and many young sailor’s life with it. The cause was overloading. The owners of the ships wanted to make as much of profit as quickly as possible. This meant stowing your ship as full as possible with cargo. There were in that time already regulations on how heavily ships were allowed to be loaded - but this was hard to check. It would require every ship to be inspected before take-of, an impossible endeavour. Eventually Samuel Plimsoll took up the cause. His solution? A line. A simple white line on the side of a ship. If a ship was too heavily loaded the line would be under water. This line allowed for quick visual inspection and turned out to be a very effective measure against overloading - many lives were probably saved because of this line.

But in order to convince you of the danger of over-engineering let me show you an example where it went horribly wrong. I’m talking about the juicero. You could think of it as nespresso for juice. The juicer itself costs 400$ and on top of that comes the price of the juice packages that are delivered weekly. The juicer is connected to the internet, can detect when the juice packages are over date, and warns you through an app that your juice packages are nearing their expiration date and that you should start doing some sweet juicing. However, it hit a bump in the road when the internet found out you could get the juice out of the packages by using the most common tool in existence - your hands. The bloomberg website tested this and showed that using your hands you could produce juice just as quick as the 400$ machine could.

So how can you tell if a solution is over engineered? By looking at the alternatives. Is there a cheaper or easier way to do what your solution does? Then maybe you should reconsider. This is however not as easy as you would expect.

There is a classic story circulating on the internet to demonstrate the dangers of over engineering. This story is about a pen. This is a pen that does not burn, works without gravity or in a vacuum and can withstand temperatures in the range of -120 to +150 degrees Celsius. The story goes as follows: there is a problem with pens in space. Because a pen functions using gravity (the ink flows downwards) they are quite useless in space. So NASA spend a small fortune developing pens that worked in space. Meanwhile, the russians had solved the problem by using pencils. It would have been the perfect example of over-engineering in the article. Except that this story is false. To start - Before this space-pen both the russians and americans used pencils. However, pencils flake and break and this can be a big hazard in zero-g environments - short circuiting electronics or floating into eyes. They are also flammable objects and NASA tries its best to avoid such objects in spacecraft. An independent company (The Fisher Pen corporation) noticed these issues and saw a business opportunity. They developed the space-pen. Both the russians and americans have since used these pens. As for their price - in 1967 NASA bought 400 pens for a price of $2.95 each.

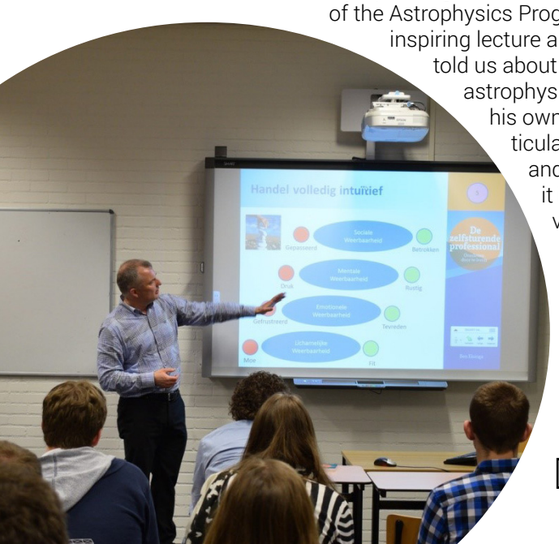
Yet in the example above the rule still holds. The space pen solved a problem nothing else could solve (and did it cheaply). So why do things like the juicero exist? The problem in this current age is that people are lazy (or busy, depending on what tone you’d like to set). The internet of things revolution therefore primarily prioritizes making things ‘easier, faster and on the go’. Juicero advertises that the juice is ‘ready whenever you are’. The produce is ‘Washed. Chopped. Ready.’ And valuing how much people would like to pay for this ‘quicker easy life’ is extremely difficult. Is it worth 400$? It just might be for some people. This means that in the future two things could happen. 1: We look at this age and laugh at the ridiculous stuff thought up. Or 2: the doom-sayers and critics look just as silly as Thomas Watson, president of IBM, saying in 1943 that ‘there is a world market for maybe five computers’.

ACTIVITIES

Batavierenrace 2017
From the end of the twenty-eight to the twenty-ninth of April, Ockham has participated in the Batavierenrace. Together with HCSA, the honours association of Groningen, we bravely defied more than 180 kilometres! However, not everything went perfectly well in this grand student battle. In the fifth stage, the tire of the bicycle could not take it anymore, the tire became flat. After a courageous attempt to inflate the tire with a little bicycle pump, it became clear that a different bicycle was needed. Luckily, Luuk lived sort of nearby. He called his parents at four o'clock in the morning and they were willing to lend out a bicycle. However, his parents still live quite some kilometres away and the bus needed to be at the DRU Cultuurfabriek in Ulft in time for the morning shift. This resulted in an epic journey through the beautiful Achterhoek. It was very fortunate that the brave Martin Essink was very good at handling the pressure. He safely brought the night shift to the house of Luuk's parents, where the bicycle was put on the bus. The bus was even on time in Ulft! Since then, there were no further complications and Thijs was able to start the last stage in time in the hamster suit. The excellent teamwork of Ockham and HCSA has brought us to place 244 in the ranking.

SympCie
On the 26th of January, SympCie organized an evening workshop in collaboration with Integrand, a student organization that helps students find internships or side-jobs and organizes career events. Jasper Ringoot and Shanna de Lang from Integrand kept their presentation interactive and even humorous at times. Each topic in their presentation was introduced by a small brainstorming session. They covered the dos and don'ts when writing a CV and motivation letter, and shared methods to prepare for an interview, including the STARR method (Situation, Task, Action, Result, Reflection). Students were encouraged to share their own experiences working in project groups or committees and had lots of questions ranging from what to wear for an interview to whether a board year counts as work experience or not. At the end of the presentation, students showed Jasper and Shanna their CVs for constructive feedback. Oreos were a nice touch as well.

On the 6th of March, the SympCie organised a lunch colloquium on astrophysics research. Dr. Frank Helmich, head of the Astrophysics Programme at the Dutch space agency SRON, gave an interesting and inspiring lecture about his work. While everyone enjoyed a nice lunch, dr. Helmich told us about the extreme technical requirements for measurement devices in astrophysics research, the position of SRON in international space research, his own experiences on the Herschel satellite project, and more. One particularly surprising fact is the time scale over which projects at SRON and other space agencies take place; over the duration of a full career, it is not unusual to work on only three projects.The lecture was well visited, and certainly sparked some interest in a branch of engineering and research that's not seen as often.



SympCie
On the 30th of March, the SympCie professionalisation event in cooperation with Salio took place. After arriving at Saxion, we started off the evening with a LinkedIn workshop by Leontien Biemold. First, the basics of a good LinkedIn profile were covered, and afterwards, we had the opportunity to review each others' profiles. A lot of useful feedback and profile updates were generated, and many Ockhammers really took their profile to the next level.

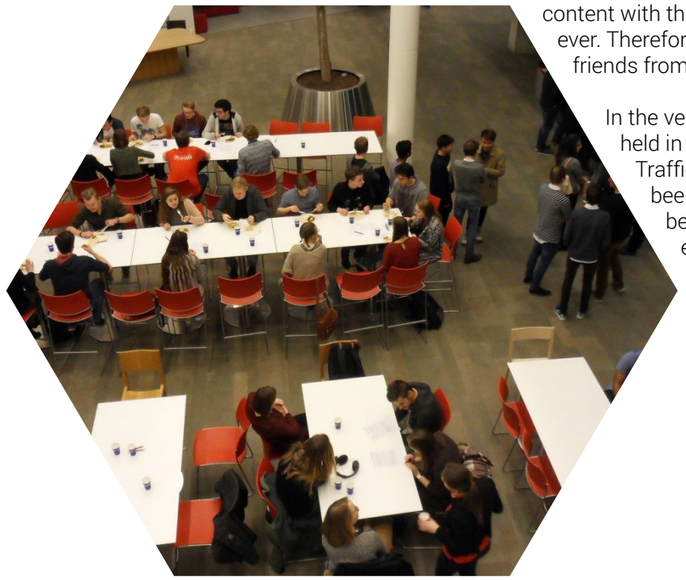
On the 6th of April, the SympCie organized a lunch lecture in collaboration with our sponsor Thales. Sigrid Reumer, Recruitment Consultant, first gave a brief overview of the company. New Business Director Mike Balm then took over with the main topic of this talk: Internet of Things 2.0. Whereas Internet of Things 1.0 offers nothing more than a collection of sensors operating independently, Internet of Things 2.0 integrates all these sensors into a multi-purpose centralized application.

ACCIE & DriCie
On the first of February, the ACCIE and DriCie teamed up and organised the Bachelors Introduction Activity Can't Reach Much Hoger together. Something horrible had happened. A good friend of Ockham, Rudolph von Doofenschmerz, has been killed. The first year students were divided into teams to find out what had happened. It appears Rudolph had some affair with Anne… Next to the quest to find the truth about Dr. Doofenschmerz, the first years also engaged into strategic thinking when they played Living Stratego and Stickerrace. Right after the ACCIE part, the DriCie made sure that there were enough drinks for everyone. It was quite a 'gezellige' evening. Many active Ockham members have helped during the event and the ACCIE and DriCie are very thankful for their assistance.

In March, Ockham went pooling at the Snooker and Poolcentrum in Enschede. Luuk got everyone who beat him at the game a drink, so it became an expensive evening for him. We found out that the music they play over there is very good.

On the eight of April, the Alumni-drink was organised in the Vestingbar. Harambee had a drink in the Vestingbar at the very same time. To make things clear, that association is not related to the gorilla that was murdered in Ohio in 2016. Nevertheless it was sociable evening. We even ate hamburgers from a barbecue!

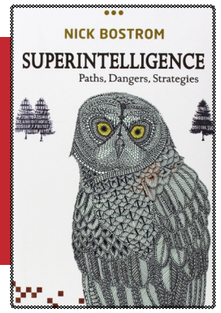
In May, the Master Honours students from Change Leaders and Research have met and have dinner together in the Citadel. The Master students, Nelleke and Celeste were quite content with the dinner. There was quite some meat left however. Therefore we donated some 'surprise meat' to our good friends from Atlantis.



In the very beginning of June, a scavenger hunt has been held in which three teams competed for hammies. Traffic signs have been found, mini games have been played and the French National Anthem has been sung. In short, it has been quite a colourful evening.

Superintelligence

A Review by Guido Ritsema - van Eck



'What if?': at first glance, these two words are central to Nick Bostrom's Superintelligence. What happens if we build an artificial intelligence that is smarter than humans? What if it is smarter than all of humanity together? What if it can improve itself? Superintelligence explores what a future with strong artificial intelligence may look like without getting overly technical: while the book is very dense with information, the answers it gives to these questions don't require any particular background to understand.

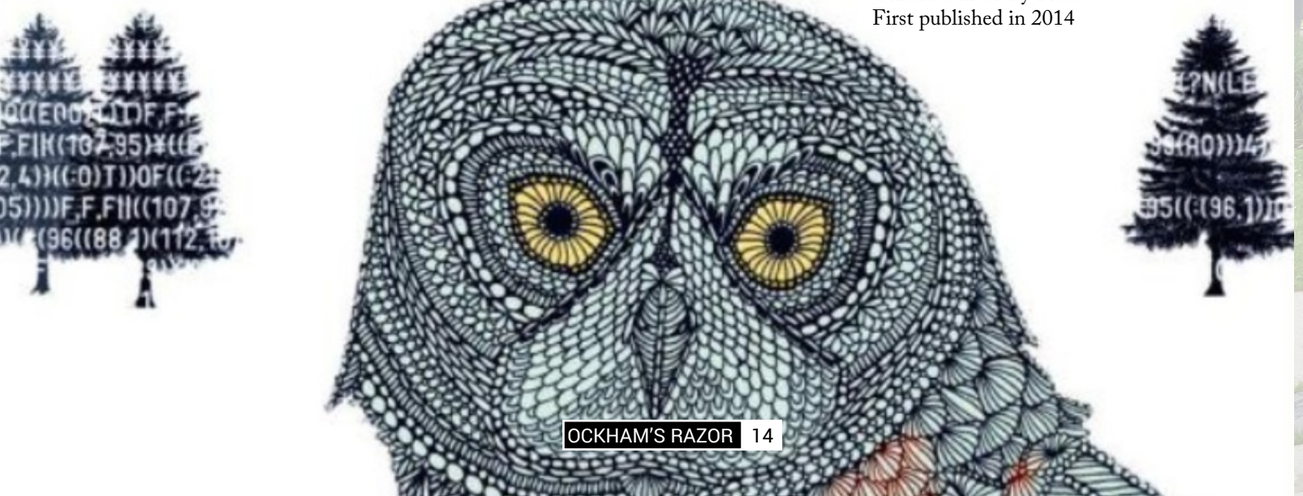
Starting from a sketch of the present achievements in the field of artificial intelligence, Bostrom goes on to describe potential paths to superhumanly intelligent AI ("superintelligence") and outlines a model to estimate how fast a self-improving AI might upgrade itself into a superintelligence. After this technologically focused start to the book, however, the actual meat of Superintelligence comes into view: the problem of how to control a superhuman intelligence that thinks in non-human ways.

First, reasoning from the fact that an artificial intelligence is most likely built for a specific purpose, Bostrom gives a plausible account of what a superintelligence might want and do. This leads into the simple question whether or not superintelligence is bad news for humanity. The answer, of course, depends on whether or not we solve the control problem. The remainder of the book explores possible ways to control a superintelligence, the implications these methods may have, and what the most desirable way to use a controlled superintelligence would be. All throughout this part, the importance of solving the control problem is further underlined.

Although Superintelligence is essentially all speculation, it is well-informed speculation. Bostrom draws extensively from philosophy, economics and history, as well as actual AI research, to support the scenarios he sketches. While some of his predictions seem outlandish or sensationalistic, he generally manages to draw impressively sensible conclusions from the very little information available. This is a large part of the charm of Superintelligence: even if you do not agree with its emphasis on the control problem or its transhumanist undertones, Superintelligence is a great blueprint for looking into the future from an analytical perspective. Although it does not provide any definitive answers to the questions it raises, the questions themselves are worth considering.

All in all, Superintelligence contains a lot of fascinating ideas packed into just over 300 pages. While the ideas are certainly worthwhile, whether or not I would recommend reading it depends. If you are not put off by its information density, and remember to second-guess the author here and there, go ahead and put it on your reading list.

Superintelligence: Paths, Dangers, Strategies
Nick Bostrom
Oxford University Press
First published in 2014



“Students always colour the environment and make a place convivial and vital”

An interview with Gert-Jan Hospers

For this edition of Ockham’s Razor, I talked to prof. dr. Gert-Jan Hospers about his research, the foundation established by him, the role of students in regional development and his experiences with the Honours programme.

What is your background and how did you end up here at this university?

“I graduated in public administration, economics and law at the universities of Twente, Tilburg and Utrecht. After that I worked at the Dutch Ministry of Economic Affairs, but only for a short period, because I missed the freedom of academic life. Therefore I seized the opportunity to become a lecturer at the University of Twente in 2000 and to do a PhD, which I finalized in 2004. Since then I have been working and teaching in the field of urban and regional development, both in theory and practice. In 2009 I got a part-time chair in this field at Radboud University in Nijmegen. Due to my work, I travel a lot, but mostly within the eastern part of the Netherlands, where I feel at home.“

What research are you currently working on?

“At Twente University I am based at BMS where I work on a research project on strategies on how to tackle population decline in the countryside. I compare the Achterhoek and Twente with two regions in Sweden. It is very interesting to see the differences in ‘mental maps’ between the Dutch and the Swedes: what we consider to be ‘far away’ (e.g. driving 30 minutes to the nearest shop), is common practice in the Swedish countryside. Urban and regional development is not only about ‘hardware’ and ‘software’, but also about ‘mindware’, i.e. how we perceive issues in our daily environment.”

You are the founder of the Stichting Stad en Regio (Foundation City and Region). Could you tell us more about this foundation, its background and its goals?

“Due to a reorganization at BMS in 2015 I am now working part-time at the University of Twente (one day a week). Also at Radboud University I work for one day a week. The remainder of the week I work on projects for Stichting Stad en Regio, a foundation that is committed to urban and regional development at a human scale. Places – be it villages, towns, cities or regions – affect people and that is what I want to account for in the projects I do. For example, I advise the region of the Achterhoek on how to develop viable economic strategies, give presentations on how to revitalize town centres and work with a film producer to portray local entrepreneurs and their firms.”

AN INTERVIEW WITH GERT-JAN HOSPERS

In what ways can students of a regional university like the one here in Twente contribute to regional development?

“By doing internships and graduation projects in regional organizations (e.g. Bolletje or the City of Enschede) students provide them with fresh ideas and insights. Also starting up a spin off company yourself – the University of Twente has all kinds of support measures for that – is beneficial for the region. Did you know that Booking.com and Thuisbezorgd.nl originally have been set up by UT-students? Last but not least, the simple presence of students in the region, in the town centres of Enschede and Hengelo, is already an asset for Twente. Students always colour the environment and make a place convivial and vital. In the end, you know, regional development is about people.”

What is your vision on the Honours Programme and your experience with Honours students?

“I feel honoured to be able to contribute to the Honours Programme. In my view, the programme is a perfect way for students to deepen their academic interests and work on personal development. Therefore, I like to give students ‘freedom within boundaries’: within a certain thematic field I let them free to follow their own research projects. I really appreciate the contacts with the Honours students I met so far. Most of them, I found out, are open, bright and energetic people. At the same time, I admire them, when I see how busy they often are with extra-curricular activities, like sports and membership of study associations –mostly Honours is not the only thing they do besides the regular study programme. I hope that they are also enjoying student life!”

Thank you for your time. Is there any takeaway message you would like to share with the readers?

“I once saw a coffee mug with the text ‘Do it with passion or not at all’. I think this quote gives some direction in the embarrassment of choice we all have to deal with. There are so many things you can do in life, but when you know what you like and what you are good at, it makes it easier to choose.”

Name: Prof. dr. Hospers
Education: Public administration, economics and law.

2004 – current: Researcher in urban and regional development at the University of Twente
2009 – current: Special Professor at the Radboud University

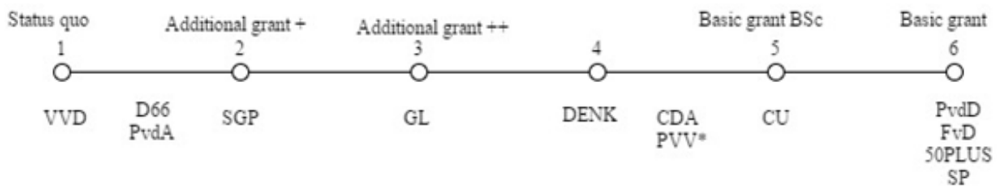
Predicting policy: the future of the loan system

by Luuk Buunk

By carefully collecting reliable data and constructing a policy scale, one can predict what the consensus of a policy negotiation will be. However, it must be assumed that political exchange does not occur. In this article, I will explain how to predict policy-outcomes by applying the theory to the loan system. This paper is based on a project paper I wrote together with Jasmijn van Slingerland, Fabian Klaster and Simon Couwenberg.
In order to be able to make a prediction on what is going to happen with the loan system, one needs to know five things:

1. The stance of the decision-makers.
2. The salience of the decision-makers. With salience is meant how much weight political parties attach to the issue. The more weight a political party attaches to the issue, the higher the salience.
3. The status quo, which is the situation as it is at this moment.
4. The voting power of the decision-maker.
5. The decision-making procedure, since different procedures are most likely to lead to different outcomes.

Once this data is obtained, one must check if the positions of the actors are single-peaked and monotonously decreasing, meaning the decision-makers cannot be indifferent towards the policy and must have a rank order that is not in conflict with the policy scale.
The data that is used to make the prediction about the loan system, is retrieved via interviews with top journalists, lobbyists and politicians, meaning the data is fairly reliable.
The obtained data is single-peaked and monotonously decreasing. Therefore, one is able to predict the outcome of bargaining process.
To proceed, one needs to create the policy scale in which the stances of the decision-makers and the status quo are situated. The scale that is used is shown at the bottom of this page. Under the scale, the decision-makers are listed, which in this case are the political parties that have been elected into parliament. On the top of the scale, one can see the policies, in this case ranging from status quo to basic grant. Additional grant+ means a minor increase in the additional grant and additional grant++ means a major increase in the additional grant. Both additional grant+ and additional grant++ can indicate changes in the OV-system and tuition fee as well. As you might have noticed, there is a gap between the additional grant++ and the basic grant for bachelor students. Parties in favour of policies left of the gap generally see the reintroduction of a basic grant as an abolishment of the loan system and therefore think introducing some sort of basic grant is a bridge too far. The gap has been created to take this into account.
Now that all the necessary data is collected, one needs to look at the decision-making process. There are three different decision-making processes that can be applied in this case. To increase the sensitivity, the policy outcomes of all three different decision-making processes are calculated and an interval on the scale will be provided as the outcome of the negotiation.



*PVV's position is unclear. Expert estimation is between 4 and 5.

Let us start with the easiest decision-making process that can be used. If the loan system is not being discussed in a cabinet formation negotiation and it is not in the coalition agreement, the future of the loan system can be decided upon by a parliamentary vote.

In such a case, one must apply Black's Median Voter Theorem, which implies that the median voter in parliament is the winner of the decision-making process and the outcome will be exactly this person's stance. The reasoning behind this theory is that parties always vote for the policy that has the best possible outcome. Next to that, a simple majority is required to pass the policy proposal. The proposal will thus be amended in such a way, that a simple majority thinks it is an improvement from the status quo. The median voter can be found by adding the amount of seats to the parties in the scale and find number 76. An important note to be made here, is that one should start counting from the right side, since the status quo is at the most left side and the VVD will never vote in favour of a change in the loan system since its optimal position is already reached. By plain counting, one will find out that GL has the median voter. This means that, in case of a general parliamentary vote, the outcome will be additional grant++ (3).

The second decision-making process that can be applied, is Nash-bargaining, also known as cooperative decision-making. The outcome of the policy will in this case be the weighted mean of the decision-makers involved. In a cabinet formation process, this would imply the combined average of the coalition partners' stances, saliences and voting powers. In order to calculate this average, one must add up the multiplications of the stance, voting power and salience of each party and divide that by the addition of the multiplications of the voting power and saliences of these parties. In our paper, Van Slingerland, Klaster, Couwenberg and I have focussed on the most likely coalitions, which are VVD-CDA-D66-GL, VVD-CDA-D66-CU and VVD-CDA-D66-GL-CU. In these calculations, we used five different types of voting power to increase the sensitivity of the research: equal, based on seats, based on mathematically possible coalitions, based on likely coalitions and based on the Shapley-Shubik Power Index. The outcomes of the calculations ranged from 1.904 to 2.940, indicating a minor to major increase in the additional grant.

The third decision-making process that can be applied is slightly more sophisticated: majority seeking with a coalition. An example of such a situation is a creation of a minority cabinet VVD-CDA-D66. In this case, an agreement is struck within the coalition and the coalition searches for a fourth party that is closest to their combined position. Then a deal is struck with that party. In this case, the outcome of VVD-CDA-D66 will be 1.65. The party that is closest to position and can help the coalition to a majority is the PvdA, who's stance is 1.5. Taking the voting powers and saliences into account, this would mean an outcome of around 1.6, meaning a very small increase in the additional grant.

If the minority coalition does not strike a deal within, a parliamentary vote will decide the policy outcome, which would lead to the outcome of 3 (additional grant++) as discussed earlier in this paper.

Concluding, an interval of these outcomes can be constructed in which the policy outcome will be. This interval ranges from 1.6 to 3, meaning that there will be a very small to major increase in the additional grant or changes in the tuition fee or OV-system.

If you would like to conduct some calculations yourself, feel free to contact me. I am willing to share the data.

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