



Speaker	Dr Lies Notebaert
Talk title	Through the looking glass: How the filters in our brain shape our world
Venue	The Mezzanine – Grand Bar & Bistro
Time	Tuesday 29 October 2019, 5:30pm

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### **Professor Robyn Owens**

Good Evening Ladies and Gentlemen

Sorry to interrupt all this great conversation just to start off, but , we are about to get tonight's event underway, so, I hope you're enjoying the venue and that you've all got a drink and some nibbles to get going for our "Raising the Bar" event.

So, before beginning, I would just like to acknowledge that we are meeting this evening on the traditional lands of the Whadjuk people of the Noongar nation and pay my respects to their elders, past, present, emerging and to note, my admiration for their skills in bringing people together in this country.

So, tonight, it's "Raising the Bar." This is a special event, 22 academics, ten bars across Perth, two speeches tonight in this particular bar and you've chosen the "Psyche Venues," so I hope you've all come full of interesting questions.

It's really important to make education part of the cities popular culture and transforming the local bars into a place where you can enjoy a drink, conversation, friends and hear about the impact of the research we're doing, is just a great opportunity.

Some very noisy people downstairs but I'm sure we will be able to hear it all and our speaker tonight will make sure that you can.

Some of the people in the audience I'm sure are young enough to be sharing tonight's event on social media and if you are doing that, either use the tag @UWAresearch and #rtbperth19. "Raising the Bar" is actually a franchised affair all over the place and UWA has a franchise for Perth, it was a fabulous event last year and it will be going on in the next few years as well.

Tonight's talks will be recorded and published as podcasts on those social media channels as well, so, if it is a bit noisy and you miss something and you just have to find out exactly what the speaker said, you can go and listen to the podcast too, but let's get on to the speakers tonight.

Our first speaker is Dr Lies Notebaert. She is a Senior Lecturer in the School of Psychological Sciences and is Co-Director of the Centre for the Advancement of Research on Emotion. Lies takes a cognitive science approach to study why some individuals are more resilient to adversity than others. She has a particular interest in the role of cognitive flexibility in individuals' capacity to show adaptation to



change and as Darwin said, “adaptation is the key to survival!” [laughing] so, let's hand it over Lies and we'll find out exactly how we do this.

Thank you. [clapping]

### **Dr Lies Notebaert**

Thanks for that introduction, Robyn.

So, you might hear from my accent already, that I wasn't originally from Perth, so I studied and did my PhD over in Belgium, where I am from at Ghent University and then the reason why I came here is really to work at UWA and the Psychology Department because the Psychology Department at UWA is one of the best Psychology Departments in the world, its listed in the top 100 and especially the research that is done on the interaction between cognition and emotion is probably .... I mean, there's probably no better place in the world to do that kind of research than here at UWA, so, that's why I came over here, it was originally to be a three year stint, but, you know, then you start to fall in love with Perth and Australia and so now, I have been here for more than eight years, almost nine years, and still doing research at-at the School of Psychological Science.

So, as Robyn said, my research is very much about, the interaction between cognition and emotion, so today, I want to talk a little about how our brain filters, so certain cognitive processes contribute to resilience, specifically.

So, I wanna start with mentioning Turia Pitt. Does anyone know Turia Pitt? We have some faces ... some people nodding. For people who don't know her name necessarily, you might know her story. So, in 2011 when she was twenty-four she was doing an ultra-marathon, which is like a hundred kilometre marathon in the outback in the Kimberley and she got caught by a grass fire, and she couldn't outrun the grass fire and then she ended up being terribly burnt, over 65% of her body and it took a really long time for help to arrive to “chopper” her out, she was not expected to survive at all, but she did. She lost, I think, seven fingers and she was in hospital for about six months. She was in an induced coma, she spent two years recovering, you might have seen the footage of where she was wearing the pressure mask and everything. So, she faced quite significant adversity going through an experience like that. But, if you look her up now, she has got her own website, she is an incredible woman. She has written books, about her experience, so she has developed online programs to help mentor other people, deal with changes and adversity. She was named “Woman of the Year” in New South Wales. She was nominated for “Young Australian of the Year” and later “Australian of the Year”, she has got a “Telstra Business Woman” award. She's the face of a lot of philanthropic organisations, one that provides reconstructive surgery for people in developing countries for sick children. She's raised millions of dollars so she's really ... if you want an example of a resilient person, I think Turia Pitt is someone that you could put up there as showing a lot of resilience.



So, this content of resilience, it's something most of us are familiar with. If I say, "resilience" you've got an idea of what that means, but different people define it in different ways and different psychologists define it in different ways, so there's lots of different definitions of resilience out there.

The American Psychological Association, which is like a guiding body for a lot of what we psychologists do, they define it as, "the process of adapting well in the face of trauma or tragedy, threats or other significant sources of stress." That's their definition.

There's also definitions, that are defined as "bouncing back" from adversity, so to say, that you say might get impacted but you bounce back to where you were before or maintaining it after functioning in the face of adversity. So, not even being affected by adversity at all.

Now, I like the American Psychological Association definition because it recognises that if you experience severe adversity, like what Turia Pitt experienced, you are going to be affected, probably by, to some extent, your behaviour is gonna change and you might have negative emotions, you might not be able to work for a while but that adversity might have less of an impact on you, as compared to on someone else and so you are seen as a more resilient person than someone else.

So, that's how we can define it.

Some people, especially, a few years ago, maybe decades ago, people saw resilience as being a trait, so this idea of, you're a resilient person, like you could be an extroverted person, you know, you're very outgoing, you're very, maybe loud and social. If you're an extroverted person you could be a resilient person as well, but more and more people start defining resilience more as a process, so that's more a set of behaviour than thoughts, and kind of tools that you could use to help deal with adversity. So this is, the idea of resilience being a "toolbox". So, you're not necessarily a resilient person but you are a person that has some tools in that toolbox that helps them cope with adversity better.

A big benefit of thinking of resilience in this way of a "toolbox" is that it means, you can help other people achieve those tools, develop those tools, acquire those tools and help them become more resilient, because if it's a trait, a trait is seen as something that is pretty stable, like you're born an extroverted person that you're gonna remain an extroverted person but with resilience that's not the case. You can learn to be a more resilient person and I'm gonna go in a little about what those tools might be and how we can acquire some of those tools that help people to become more resilient.

A personality trait is also something that you show in lots of different circumstances. So, if you're an extroverted person you could ... you will be an extroverted person at work and also at home and if you go out with friends and if you go out on holiday, you will be an extroverted person in all those circumstances but with resilience, you can have good resilience when it comes to dealing with some types of adversity, for example, stress at work, you might be able to cope with that very, very well but then some other adversity happens, like you lose someone that you love and you are not able to



cope with that very well and that maps onto how we understand resilience. You can be resilient in some aspects but not when it comes to other adversities. So, this idea that resilience is a “toolbox” works better there as well, because, you might have the tools to help you cope with stress at work, you might have really good time management and planning skills but they’re not necessarily going to help you deal with the loss of a loved one. So, in that sense, the idea of resilience as a “toolbox” works as well.

So, you can show different resilience based on the adversity that you encounter, but there’s also different types of resilience. So, for example, one type is emotional resilience. So, being able to show positive emotions, not being impacted very much by negative emotions, and a that’s ... a lot of my research is on showing that kind of emotional resilience.

You also have behavioural resilience, so that’s something that is studied a lot when it comes to kids because with kids you can have them ... they can act out, they can become aggressive, become, you know, angry with lots of bullying and it’s the same with grown-ups as well, you know, people can resort to being aggressive and violent when they’re going through some adversity but you can show behavioural resilience by not engaging in those behaviours and instead engaging in the behaviours that are going to help you and make you feel better, like, go play sports for example, because you’ll be able to, kind of overcome something by being engaged in sports.

Then you have social resilience, a lot of people in Perth, as me, have come from somewhere else, and you know, it takes a while to build up some new social networks if you’ve moved from somewhere else, so that can be seen as form of social resilience, for example, where you can maintain or develop new social connections, even if there has been a change.

Then you can separate from the individual resilience and kind of go to more group based resilience as well, so community resilience is something that is studied a lot when it comes to natural disasters like floods and earthquakes and bushfires but also terrorism for example. So, how does a community come back from that? Can they maintain those strong community links? They don’t resort to discrimination or racism for example, in the face of those events.

And then, similarly, you have organisational resilience. Big companies, they have to deal with economic fluctuations, maybe restructures and a resilient workforce is going to help them navigate those changes quite well.

And then, cultural resilience, so that refers to the ability to maintain and develop cultural identities and those important cultural practices and knowledge in the face of some threat imposed on a culture. So, if there’s a culture that , is-is threatened, maybe by another culture moving in, can they maintain that cultural identity? Can they ... when they get the space again, kind of, redevelop those cultural knowledges and practices and show that resilience that way?

So, if we go back to individual resilience, so who are these resilient people? What do they look like?



So, you can think about these hero stories like Turia Pitt and kind of think about what are the characteristics that she has that make her a resilient person. You can think of examples of community resilience. We've seen a few in the news over the last few years, unfortunately, where communities were impacted by adversity and you can see how they react.

I remember being in Manchester shortly after the bombings happened and you could feel the resilience in that community somehow.

You could also see it in footage in Paris. Did you see the footage when the Notre Dame burn down and you had the Parisians spontaneously bursting into French hymns while they were watching their beloved Notre Dame burn down? You could feel them kind of come together and say, "well, we will get through this, we will rebuild and it will be fine."

So, if you think about these hero stories, obviously what Turia Pitt had to go through, that kind of horrific event, that's ... that will have a big impact and she's shown huge resilience in response to that, but, you can also think about people in your immediate environment that show resilience, day to day, because resilience is not necessarily something that is only out there for these "hero people", but a lot of people around you, probably are very resilient.

So, if you think about parents and all the day to day adversities that they have to go through, it's a challenge and being able to keep going day to day, requires a lot of resilience as well.

If you're a carer for someone, similarly, that's very tough and to be able to keep going in that caring role, requires a lot of resilience.

If you think about people in really difficult jobs, like, firefighters and ambulance workers and police, they encounter a lot of adversity as well, but they can keep on going, so a lot of people in those jobs show quite remarkable resilience as well.

So, if you think about someone like that in your immediate environment, what are some of the characteristics that you might think about, so you could think about maybe those people, those resilient people, maybe they have sense of humour, maybe they're very optimistic people, they're very persistent people, they just keep on going.

You have a lot of faith-based resilience as well if you can see a higher meaning in something, that can contribute a lot to resilience, these resilient people seem to be quite confident in their capabilities and they know that they can affect change in the world and they'll get there, it'll happen, even if it takes a long time or, at the same time, they might recognise their own limits. They might go, "I'm a little bit overwhelmed, I kinda need some time out, I need some time to myself," so, recognising your own limits, that would be part of resilience as well.

So, you can start thinking about the people in your own environment, what do they look like? and what are those characteristics associated with resilience.



So, when people started noticing that some people seem to be more resilient than others, people started to do research in this, or, maybe it was the other way around. Maybe the term came because of some research. Because, it might surprise you but, research into resilience is fairly new, so the term was first used in the 1970s. That's not that long ago, and that one of the first people or scientists that used that term was a researcher called Emmy Werner and she did a study in Kauai, Hawaii. Does anyone know the place? In the 1950s that was a very, very poor place and she basically followed up every child born in 1955 in Kauai. That was about seven hundred kids and she followed them up for forty years, which is quite impressive. And so, because it was a very poor place it had a lot of children growing up and dysfunctional families with a lot of alcoholism, there was a lot of unemployment with a lot of mental illness and the parents as well and she noticed that about two thirds of the children that grew up in these environments, they went on to show not so great outcomes, like also turning to alcohol, being engaged in criminal activity, having babies out of wedlock, which was a big problem at that time, frowned upon! But about a third of the children that grew up in the same high-risk environment, they didn't show those negative outcomes, but they became ... turned out to be highly functioning adults, making big contributions to their society and so she was the first to describe those as "resilient children" and ever since those kinds of observations, like not everyone facing adversity turns out the same way.

People have started to look into now what contributes to people being who they are, what differentiates that one-third of children from the other two-thirds of children?

And so, if you look at the research on resilience it shows that one of the most important factors of having strong social networks, so having people around you that will support you, that will care about you and that will help you.

So, if you imagine being in a car crash, think about how having a strong support and social network is going to help you. I mean it can help you get away from the place of the car crash for starters, someone is going to give you a ride home, if you were injured, some strong social networks, they might help you, provide you with food or drive you to doctors' appointments or anywhere else that you need to be until you have a new car. They might help you organise a new car. They might help you bring your children to school, for example. They might offer you a shoulder to cry when you wanna talk about how horrific it all was and how scared you were. They might tell you, "you're doing really, really well, you'll get over this, it's gonna be fine." They might encourage you to go back into the car and sit back behind the wheel.

So you can imagine having those really strong supportive networks is going to help you kind of cope with that car crash and a better way as compared to if you had no social ... no strong social network.

And maybe one of the reasons why it's a big factor that contributes to lots of different, or that is very often found, is because it's a kind of tool that you can use in lots of different situations. So, when it comes to the adversity of a car crash, you could use it. If you're stressed at work you can, you know, go and hang out with your friends to let off some steam, so, and for a lot of different adversities,



having strong social networks, might be really important and these friends, these supportive friends might help you acquire other tools.

So other tools in the civilians “toolbox” that research has found, are important is, for example, planning. So, the ability to make realistic plans and take steps to carry them out. So, if you’ve been in this car crash, the ability to, you know, efficiently organise a new car, figure out how to get the kids to school in the meantime until you have a new car. How to do the food shopping, you might plan to, “oh, I’ll just order online for a few weeks and I’ll have the food delivered to my house.” So, you have good planning, capability, you’ll be better able to cope with adversity.

Another important one is being positive. So having a positive view of yourself and your capabilities. Again, if you are in this car crash, thinking, “I’m a strong person, I’ve been impacted by this now but I’ll get over this, I’ve dealt with worse in the past, I know I can do this.” So being positive about yourself is important.

Then also, skills and communication and problem-solving, referencing the car crash again. If you need to communicate to insurance agencies, being able to communicate really well is going to help you. Being able to communicate to your work how long you’ll be out of work for, what you can do, what you can’t do, that is going to help you have the workload that is good for you in that circumstance.

Problem-solving as well. If you’re dealing with the insurance company and they’re throwing up barriers left, right and centre, being able to problem-solve, how to get around those barriers, is going to help you as well.

And emotion regulation. So, emotion regulation refers to the capacity to manage strong emotions. Sometimes it’s fine to express negative emotions and it’s important to express negative emotions if you, if you’re fearful, if you’re angry, sometimes that can be very useful to express that, to elicit help from others or to get others to do stuff. Insurance companies, maybe again. Maybe some anger can sometimes be helpful but at other times it’s not going to be very useful to express those strong emotions in certain contexts and you’re better able to try and suppress that a little bit and then, kind of let them air again when it’s at a more appropriate time. So emotion regulation, knowing when it’s okay to express emotions and which emotions, and when it’s not, is also going to help you.

So, how do you develop that resilience? As you can see from these examples, it’s really a product of how you interact with the environment. You don’t walk away from the car crash being a resilient person, but it’s the thoughts that you engage in and the behaviours that you engage in and the emotions that you express, in the aftermath of that car crash that kind of adds up to you being a resilient person.

Now, how you interact with the environment, how you make decisions, which emotions that you express, how you interpret everything that’s going on around you, is very much determined by the filters that you have in your brain and that’s a large focus of my research, these brain filters.



So, to explain brain filters, at any one point in time, there's a lot of information that comes at us. Even now, you can hear there's lots of stuff going on out there, there's lots of stuff going on out there. Maybe there's ... have you ever been in a room where there's a ticking clock? And once you start paying attention to that click ... ticking clock, you cannot turn it off. But usually, we do turn off these things, or if someone is chewing very loudly next to you, hate that, but we're very good at kind of ignoring stuff that is not relevant to us and focusing on the stuff that is relevant to us. So we have brain filters that help you do that, so, your brain filters help you focus on the things that are important to you, for example right now, my voice is very, very important to you, so you are all very much focused on me and you're ignoring everything that goes on around you, but, it will also let in stuff that is unexpected or very loud. So, if someone drops a tray of glasses out there, you're all gonna turn your attention to there because, things that are very loud or very unexpected, might be very important.

Going back to, you know, the olden days, when we were hunted by big predators, you wanna be, you know, if some large shadow appears you wanna be paying attention to that.

So, those are two filters. We pay attention to what's important to us and to things that are very loud and unpredictable. But we have other filters as well and not everyone has the same other filters, so there's lots of individual differences in these other filters. So, these are some of the filters that we study in our lab. So one of these filters is called "Attentional Bias" and that's a tendency to pay attention to one particular type of information. So, if you've ever considered buying a new car, you will notice this phenomenon, because if you were thinking, for example of buying a buying Subaru Forester, suddenly you see Subaru Foresters out there everywhere. So, Subaru Forester has become more important to you and therefore your attention, where you direct your attention to, is now influenced by this goal that you have of buying a Subaru Forester.

Now, different people have different of these attentional filters, so, we know that people who are highly anxious, they tend to pay more attention to things that are negative in the environment. So, if I were a highly anxious speaker, I would be paying attention to all of the faces that look bored or disinterested or angry, and not to the faces that are supportive, that are interested, that are encouraging. And you can imagine if I have a filter like that where I only focus on the negative, that's gonna make me more anxious about doing this presentation. So, that's why this is a very good filter that you have.

If you were in that car crash and afterwards you walk around and you pay attention to, "there's so many people using their phones behind the wheel, look at that driver, he's swerving, maybe he's drunk?" If you pay attention to all those little things that might potentially indicate some threat, you're gonna become more and more anxious, so that's not good for you.

Then we have a filter that is called "Memory Bias". So, a tendency to selectively remember some things about the past but not others. Again, with the car crash, if you tend to remember being upside down in the car or, how much it hurt or how scared you were. If you only have memories of those kinds of [inaudible 28.25] events of what happened, you might become more anxious and more



depressed afterwards, whereas, if you also think back about, “look at all these people that came running to help, the emergency services were there very, very quickly, wasn’t that amazing!” “Do you remember that person who immediately came over and gave me a sweater, because I was cold?” If you remembered those things as well, that’s gonna massively change your memory of that and maybe how scared of, similar things happening, you will be in the future.

Then there's another filter called “Interpretation Bias”, so that’s how you tend to interpret things that could be ambiguous. So for example, if someone walks past you, someone that you know and they don’t say, “Hello”, you could interpret that as, “Well they’re just busy and they haven’t seen me,” or you can interpret that as, “I must have done something horrible and now they’re angry at me.” And so, depending on your interpretation, you’re gonna have a very different emotion to that and then maybe a different behavioural action that follows from that.

So, to illustrate, imagine that , you were at a restaurant or a bar, in the city on George Street, and you’re meeting someone for a date and so, you’ve been chatting online for a while, it seems to be going well, this is the first time that you’re meeting in person, you’re supposed to meet at 7:00 pm and it’s now 7:10 pm, so they’re ten minutes late and you’re sitting there waiting. So that’s kind of an ambiguous situation. You can interpret that in many different ways.

So, I’m going to give you an interpretation and I want you to tell me what the emotion would be that would result from making that interpretation to the situation.

So, what if you think, “Well maybe this person was in a car crash? The ... It was really busy, it's raining horribly, they would’ve texted me if they were just running late, but they haven’t texted me, maybe they’re in a car crash?” So how would that make you feel?

**Audience**

Anxious

**Dr Lies Notebaert**

I am hearing a lot of “anxious”. Yes!

If you are thinking, “Well that’s inconsiderate of them. I always make the effort to be here on time. I expect other people to make the same efforts because it's really inconsiderate!”

**Audience**

Angry

**Dr Lies Notebaert**

Angry! Yes!



If you think, “Well they obviously don’t care, maybe I’m not interesting enough for them, nobody cares about me, this always happens. I’ve been stood up five times already. I might as just ... I might as well just better off not be here, I mean, nobody cares.”

**Audience**

Depressed, sad.

**Dr Lies Notebaert**

Depressed, sad. Yeah.

and if you think, “Well maybe they’re taking extra time to get ready? Maybe they stopped somewhere to get me flowers? [laughing] what would that be?”

**Audience**

Optimistic!

Delusional

**Dr Lies Notebaert**

Optimistic [laughing]

Delusional, yes!

The point is, different interpretations are going to lead to different emotions and then they’re gonna lead to different behaviour as well.

If you think they are an inconsiderate bastard, you might treat them very differently to thinking, “Oh, maybe they went out and got you flowers?” and so that might influence whether you’re gonna get a second date or not.

So, these “biases” will have a big impact on how we experience emotions and how we interact with our environment.

Now I said that we studied these “biases” in the lab but it’s quite difficult to do because we can’t ask people, “What kind of filters do you have in your brain? Tell me about your brain filters.” Because often people are not aware that-that they are having these filters and how they’re tuned exactly, so we have to try and develop cognitive tasks, computer tasks, that will reveal whether a filter is present or not.

So, I wanna run a short, small experiment on your guys now.



So, can you all pull out your phones please, or something that you can take notes on? If you have a pen? These days, if anyone has a pen, you can write on a napkin, but I am gonna be reading out a list of words that I want you to write down.

So if you pull up your phone, open Notepad or any program where you can enter a list of words that I'm gonna read out to you.

Yeah, you're all good?

So, I'm gonna be reading pretty fast, so please type fast and try and keep up with me. So, here's the list:

Italy

Forest

Steady

Die

Running

Morning

Lecture

Flu

Week

That's it, that was the experiment, well done!

So what I did here, I don't know if anyone caught on? But some of these words are homophones. So they are two words that have the same pronunciation and if they are slightly different, they are cleverly disguised by my foreign accent but you spell them differently.

So we had words in there "die" that could be you know "dying" you know, the verb "dying" or it could be paint "dye" so they are spelt in different ways.

Morning could be "morning, midday or afternoon" or it could be grieving someone "mourning".

Flu could be the disease or it could be what a bird does "flew".

And then, week could be "days, weeks, months" or it can be "strong v weak".

So, with that last one, can I get a show of hands how many people wrote: "week" as in "days, weeks, months"? And did anyone write "weak" as in W-E-A-K?



So, you see, there's individual differences there. People interpret it in different ways. So what we can do by this task is kind of reveal the interpretation that someone gives to ambiguous information.

Now, if you wrote down all the negative interpretations of these words, you know, mourning, the dying associations and weak not strong associations, it doesn't mean that you have some kind of disorder [laughing] definitely, we have to do this across many trials and compare groups of people, but what we would do is, we compare a group of highly anxious people and a group of people who do not tend to be anxious and then you see that on average, highly anxious people, more often, report these negative associations, but there's lots of individual differences. So, we can look at group differences there, so it doesn't mean there's something wrong with you, it could just mean that you know, you have the flu and you're feeling weak. [laughing]

So these are some of the processes that can contribute to resilience. So one big important question is, "can resilience be taught?" and I already said "Yes" if you consider resilience to be a process, it means it can be taught.

Now, one very important thing to recognise when it comes to discussions about improving resilience is that building resilience should not be the only way we use to make people cope better with adversity because, if you can change something about the amount of adversity that people experience, that's what we should be doing.

With Turia Pitt, that marathon race should have never happened because the conditions were dangerous. They shouldn't have done that! It's not the right thing to make people experiencing burn wounds, those kinds of burns, more resilient, we should be trying to not have people experience these devastating burns but car crashes, if you want to implement road safety measures, you don't want to make people more resilient to car crashes without doing that and that's the case for, a lot of things where we can make social structural changes that are going to reduce the adversity that people experience so then we don't have to build resilience, so we can provide access to healthcare services. Because, you know, things can spiral out of control if you don't have good access to healthcare services.

We can give people access to housing and jobs and education, secure neighbourhoods and that's gonna reduced peoples exposure to adversity.

Self-determinism is really important. If you're providing solutions for groups of people, have those groups of people be involved in implementing the solution because, we know from a lot of research, that is critical to achieving good outcomes and not compounding the problem even further.

City town planning can help there as well.

Did you guys see that TV program that was on just maybe a few weeks, a month ago, where they put a kindy and an aged care facility? That was beautiful. Everyone just got so much better because of that. So, those kinds of city town planning exercises can really help.



And then, improving equity and equality. Think about it. If you could reduce discrimination and sexism and racism, how much less adversity people would have to cope with.

So, it's really important to make those social structural changes and then think about improving people's resilience to things that we can't avoid or are very difficult to avoid or we haven't been able to get there yet.

So, some of these "tools" that we've discussed, we know that we can change them and when comes to these brain filters, these cognitive biases, what we're doing in our lab, is developing cognitive training tasks to help people tune their brain filters in more adaptive ways. So, we're helping them to interpret ambiguous situations in a more positive way and not a more negative way.

Again, we're doing it in a sneaky way, where people don't really know that they're being trained, because we think if you can make it a habit like that, if you train them and make them do it over and over and over again, it'll become habitual, and that works, we know that that works. You can do it in a very explicit way as well, if you go to a psychologist or a therapist, they will help you, if you've got one of these "interpretation bias" brain filters, they will help you realise that you are always jumping to the worst possible conclusion and they will help you, kind of practice thinking about other conclusions that are possible as well that are not quite as threatening.

So we can change these brain filters. We can tune them differently.

When it comes to social networks, you can actively foster better social networks. You can , accept help and support which is something, sometimes, something that people have difficulty with, but we know it's really important, social support, so let people help you. You can become active in civic groups or in face-based organisations, a very good way to build your social network. You can help others when they need help, that's a really good way to feel better about yourself as well.

So, you can develop those social networks and that is going to help you be more resilient to the next adversity that you encounter.

With planning as well, there are lots of books out there to help you become a better planner, time management, there are also very easy ways that you can teach yourself to become a more confident planner, like break large jobs down into smaller chunks and get a sense of achievement along the way and the same with communication skills and problem-solving and even conflict resolutions.

There's lots of online tools and books that you can access to kind of, develop that tool in your resilience "toolbox".

For being positive as well, you can try and train yourself to be more positive so when you encounter a problem, think, "This is not a problem, this is an opportunity." And go see it from that angle, see that many crises that can be overcome, you can learn something from it, so after you've encountered some adversity, you've overcome it, reflect on it and think, "What have I learned from this? What are



my strengths? What did I use to help me overcome this?” and then you’ll know from the next time and you’ll be able to draw on those resources next time.

Be kind to yourself as well. Sometimes we are very, very critical to ourselves, thinking, “Well I’m a loser for behaving this way or for still being so depressed or anxious after this car crash.” But, think about if your friend had gone through that, would you be so critical to your friend, probably not. So try and be as nice to yourself as you would be to a friend of yours.

And then emotion regulation as well. You can learn to recognise stress and how you deal with stress. Like, learn those patterns that you engage in that might not be helping you very much. For example, you get very stressed, you start drinking. It's not the best. You know, a drink to relax is fine, but we know that drinking leads to a more negative mood and maybe less productivity the next day and so learn to see those patterns, these [inaudible 41:04] patterns that you engage in and then try to do it differently, and you can ... these are all things that you can learn with the help of a psychologist or a therapist as well and they will teach you breathing exercises and mindfulness and those all techniques that we know can help with that kind of emotion regulation and stress management.

So resilience can be taught and that’s really my “take-home” message for today. , resilience is not something extraordinary, a lot of people show resilience day to day, and even if you were the kind of person that feels that they’re not very resilient, it's never too late. Resilience is something that we can all develop and a lot of it has to do with our mindsets, our brain filters, but if those aren't working for you, you can change them as well and then you can pick up a lot of these other tools individually in the “toolbox” as well and maybe with a little help from your friends as well.

Thank you! [clapping]

### **Professor Robyn Owens**

Thank you Lies, that was fabulous. I hope the audience is feeling resilient. I hope Lies is feeling resilient because we’ve got some time for questions now. I might, just while you’re thinking about yours, start off with one.

And so, do you think resilience is a little bit like elasticity and if it's tested a lot, it ends up being like an old pair of underpants that keep falling down? [laughing]

### **Dr Lies Notebaert**

No, I think in this case I think resilience would be more like washing your underpants at 60 degrees like it makes the elastic stronger! [laughing] Because I think some people might not realise that they have resilience or they might not have a lot of resilience when encountering that first adversity, but then they come out of that and they go, “Oh, actually, I coped pretty well with that, I surprised myself there!” and then they go into the next adversity a little bit stronger and so that’s a concept that we refer to as like “post-traumatic growth”.

### **Professor Robyn Owens**



Excellent!

Questions then? Yes?

**Audience**

I am really trying to think how I could extend the underpants metaphor, but I have fear of failing! [laughing] I heard a study about Iraq veterans and something that was mentioned with it, those who had experienced substantial adversity as children but not in a traumatic way, were more inclined to be able to take the hectic experiences in their stride, is that something that you could verify?

**Dr Lies Notebaert**

So, you mean they have experienced more adversity before going into Iraq?

**Audience**

No, as children particularly and growing up but in the kind of context of trauma, but you know, I think that some of the examples that were given were, you know, immediate death of loved ones and that kind of thing in a supportive safe environment.

**Dr Lies Notebaert**

Yeah.

**Audience**

Something that is consistently .....

**Dr Lies Notebaert**

That would be consistent for me to say to you that is gonna depend for different people as well. If you as a child have experienced lots of adversity but you had a very supportive environment that guided you through that and would teach you those skills that you would need to get through that, then if you encounter adversity again, you'll be able to apply those. But, I think there might be situations as well where children experienced a lot of adversity but they didn't develop those tools because they didn't have those supportive carers around them that would help them and then, that ... more adversity might then just break-break them. So it would very much depend on the support that would have gotten as a child and that was something that was fun in that study by Emmy Werner as well, is that the children, even if they didn't have supportive parents at home, if they had a very supportive aunt or uncle or a school teacher, they became part of that one third as well, that did very well, because they were given these tools by these adults to help them cope with that chaotic life that they were in.

**Dr Lies Notebaert**



Valerie?

**Audience [Valerie]**

Thank you Lies [inaudible 45:02] it has been interesting.

Maybe one of the things that surprised me, is you say that resilience [inaudible 45:09] is having a good social network.

I did not think about that, I saw that ... I see resilient people as very independent, autonomous people that can do things by themselves so that to me, it is quite interesting that you incorporate into resilience [inaudible 45:30][overtalk 45:30] having a social network.

**Dr Lies Notebaert**

I think with a lot of things, it's important to be able to do both, so it's important to have that confidence and your own abilities and to tackle problems yourself so that you know next time, "I was able to do this myself, this is great! I don't need to rely on others all the time." But some things you won't be able to do purely by yourself and will need to enlist that social support and so then you need to know your limits and go, "Well, this is beyond what I am capable of, I'm gonna enlist some help." Or even, you do everything yourself but then you go and debrief with some people at the pub, so, it's gonna be a bit of both. You need to be able to do things independently and that's probably what you see a lot of these highly resilient people doing, but they do have the social support to either help them with that or to just, provide them with some distraction outside of that to help them cope.

**Audience**

I wondered about that too. Whether it's not so much having lots of big social networks as to perhaps having a few people who are immensely strong, who have depth, so someone ... not like having one hundred friends on Facebook but the case of two or three, a small group, but whose relationship is intense and supporting.

**Dr Lies Notebaert**

Yeah. I think as long as you can ... so you can measure the strength of a social network in different ways. You can measure how big it is but then you also can measure like how often would you interact with the same person, like, the depth of a relationship then as well. And so, for some people, having lots of different people might be helpful because they can learn different tools from all of these different people that they need and then in some situations, or for other people or depending on who is around you, you might just have those two or three people, that you are very close with. It's a bit more risky then if one of those people falls away, that leaves a big gap then, as well. So, you know, again, in the middle is probably a good place to be.



### **Audience**

Thank you very much for that really interesting talk. I have got a question, I guess you mentioned early on that the idea of resilience is relatively new, certainly in psychological research, how does that idea relate to older ideas like, previously, we might have talked about someone's character, you know, how they develop their character over time and the sort of strength of character that you develop through adversity and that kind of things, are those ideas related, and yeah, and is that same idea, I guess developing at like a muscle through adversity, does that still hold in this research?

### **Dr Lies Notebaert**

Yeah. Well I think even though the term “resilience” was also only coined in the 1970s, obviously this is something that people have seen around them for a very, very long time, and they may have called it different things, like strength of character or grit or the determinism or whatever other words that were used to describe those kinds of people, but I think systematic research into what makes those people who they are, that hasn't really started until the 1970s.

### **Professor Robyn Owens**

I have got another question and it's about the sense of behaviours that you allow yourself to have. So, most of the time, we're mostly pretty well-behaved but some people I know, especially when they're driving in the car on their own, love to let fly about all the other drivers on the road, is that good resilient behaviour or not?

### **Dr Lies Notebaert**

Oh, that's a tricky question, especially because I'm one of those drivers! [laughing]

So, I think – so we define, in psychology, we define something as being a problem when it starts interfering with other aspects of life and I think you could apply the same thing here.

If you're just yelling in a car and you need to let out that steam because you get frustrated by other people not being able to merge, I think that's fine! [laughing]

If you start driving dangerously because of that, and then endangering other people, getting tickets and so on, that starts interfering with other aspects of life and that's a problem.

If you get so worked up that by the time you get to work, you're so angry and you don't participate in meetings because you have that lingering anxiety, that starts interfering in other areas of life and that probably means that that's problematic, but if it's just you shouting in a car, go for it! [laughing]

### **Professor Robyn Owens**

Okay, that's clear? [laughing]



Do we have any other questions?

Resilience, a fantastic topic. I hope you are all feeling a lot more resilient after that talk and you have put a few extra tools into your “resilience toolbox”. Optimism, problem-solving, planning, networks – we have one more question, great! [laughing]

### **Audience**

I’m just filling the gap, I’m not being greedy.

I’m just really interested from a methodological perspective as to how you mitigate against the kinds of ... like just taking the example that you gave us of that fun word task, how do you mitigate against the kinds of , word associations that naturally flow and the kinds of ... well I mean we’re such pattern makers in the way we think and so, and of course, naturally we’re all trying to second guess what is actually being asked of us really, you know the sorts of word choices that you make might be because you are relating ... you know, so how do you manage that kind of ... cause obviously in a clinical context, it's not a contextualised empirical situation that is ... you know people ... an obviously this is something psychologists have done a lot, but people are obviously trying to gain the game.

### **Dr Lies Notebaert**

Yes, but even more of a reason why you shouldn’t just be asking people, “What’s your brain filter?” Because they will give you an answer that what they believe is true but not necessarily what is true or what they want you to believe is true.

The way we mitigate against, for example, you could have written down “flu” rather than “flew” because you just had the “flu” last week and its fresh on your mind and as we know these other filters are going to bias your attention to that interpretation.

So the way we try and get around that is by having lots of different homophones in there and then you look at patterns across those, so if on average, you’re more likely across all of those, to put down the negative interpretation, rather than the positive, you’re gonna filter out some of that noise that is in there because people have different associations, based on what they recently encountered.

The other thing is, this is one method to reveal those patterns, those filters, but you want to be developing multiple different measures and then to see if the same pattern, kind of arises across all of these measures that you’ve developed, because then you have more evidence of this probably being a real thing, rather than just something that we found by chance.

So it’s, yeah, lots of evidence, one experiment and then doing lots of different experiments using different methods and to see if they all lead to the same conclusion.

### **Professor Robyn Owens**



Any more questions?

You've got your resident psychologist right here, so don't hesitate.

Okay, if not, then can I please get you to join me in thanking Lies for a fabulous talk?

[clapping]

Thank you very much, Ladies and Gentlemen, our next talk is coming up at seven o'clock, so if you're here for that one, please stay and enjoy, if you're not, that's fine, off you go [laughing] go and check out your resilience somewhere and please drink and enjoy the company, build that social network, it's very important for your resilience and I hope we'll see you shortly.

Thanks Lies.

**Dr Lies Notebaert**

Thank you.

**Audience**

Thank you, awesome work!