

**Alan Sanfey** werkt op het Donders Institute en onderzoekt hoe mensen beslissingen maken. Dit jaar ontving hij de ERC starting grant voor zijn onderzoek.



**How would you describe your lab and what makes it special?**

In terms of content, we study both the psychological and brain processes that underlie human decision-making. The aspect that makes us quite unique is that we have a very interdisciplinary approach to studying these processes. My own background is primarily in psychology, with later training in cognitive neuroscience, but the people in my lab have a wide variety of backgrounds: Neuroscience, economics, marketing, philosophy, anthropology and computational modeling. Each of these other fields has traditionally been interested in how people make choices, and so we believe a productive direction is to try to incorporate many of these approaches in order to build integrative models of decision making. Another aspect of our interdisciplinary approach is that we use a lot of different methods, such as behavioral studies, fMRI, EEG, MEG, TMS, pharmacological manipulations. We also look at different patient populations, for example schizophrenia patients and psychopaths as well as clinical populations with, for example, depression and anxiety disorders. So, what makes us unique is that we have a broad variety of backgrounds and methods – this makes life interesting, but also makes it quite challenging of course. I like to work with people from other disciplines.

**It sounds like you have a lot of people in your lab.**

It feels like a lot of people. At the moment I have twelve core people here in the Netherlands along with several masters' students that come and go. I also have three people in Italy at the University of Trento and three people in the US, at the University of Arizona. So we are quite international and make every effort to establish collaborations across the various lab sites. This size makes for a very productive environment, but too much growth is of course a challenge. It is difficult to define the optimal size of a lab. If it becomes too big, there is a risk that it starts to divide in separate sub-groups and you lose the synergy that comes with different opinions.

**How does the research environment at the Donders Institute differ from the other institutes that you have worked for?**

The most appealing thing about coming to the Donders was the infrastructure. The technical facilities are very good, and we have access to every methodological tool that you can imagine. But what is actually more important is that we have personnel around to help us take advantage of these facilities. For example, when I was scanning at the university of Arizona, we had to do everything ourselves, from sequence programming to designing software and hardware. At the Donders, we tend to be at the forefront technically, and so for example we have the latest advances in MRI sequencing and the assistance available which helps to move our research forward. Furthermore, I don't have a tough teaching load here. I enjoy teaching, but it takes a lot of time to prepare properly, and fortunately here I have the luxury to choose how much to teach. The final positive aspect here is the intellectual atmosphere. People are genuinely interested in your research and want to collaborate, and so overall, it is a very nice environment for research!

**What is your most influential article?**

I think in terms of how it has influenced the field the most, it would be an article we published in 2003 on the brain bases of the Ultimatum game which appeared in Science. That one hit very broadly and still gets quite lot of citations (687 times as on October 1<sup>st</sup>, red). More recently, we wrote a review of the field of social decision-making which I think provides a useful synthesis of the field. And finally, we published a paper last year in Neuron which is a nice advance of the work we've been doing on the influence of affective factors that may underlie social decision making. Here we looked at the influence of guilt on returning a favor, and attempted to quantify guilt both computationally and neurally. We are still following these results up, but I hope it is going to be influential in the future.

**When and how did you become interested in hormone studies?**

The hormone studies are quite a recent advance for us as a group. The idea to study the effects of oxytocin on social decision-making came from conversations with Carsten de Dreu at the UvA. Mirre Stallen, a former PhD student in my group was really interested in those possibilities, and it turned out that we had some interesting questions that could potentially be answered by hormonal manipulations. So it is an example of being in the right place at the right time! Our testosterone studies were a result of similar good timing. A postdoc in our lab, Pranj Mehta, had a lot of expertise in using this hormone and another postdoc, Maarten Boksem, had some very relevant questions, and so again the mix of backgrounds in our group created some interesting new studies.

**What kind of hormone studies do you conduct?**

One set of experiments studies the effects of oxytocin administration on social decisions. We have some hypotheses that counter the idea that oxytocin merely increases 'positive' behavior, and are particularly interested in the negative side of things, by asking for example when oxytocin may facilitate antisocial behavior such as punishment or revenge. We also have studies on testosterone in which we study its influence on trust and reciprocity, and in particular the social contexts that may interact with testosterone to induce competitive or cooperative behavior. The general cross-hormone idea that we have is that these hormones are very context dependent, that is, they do not have simple and straightforward effects on decision-making behavior. Social context is an understudied area in decision-making, and so in the future we would like to continue studying hormonal effects and perhaps also look at genetics.

### **Is it difficult to get medical ethical approval for your studies?**

We have had a positive experience with the procedure here. Overall, we found it a fair process, and the committees did their job and asked the appropriate questions. It took several months, as I believe it probably should for these kind of intervention studies. In the US it is a much more difficult process, as they are very strict on hormone research over there, and so I was pleasantly surprised by going through the process here.

### **Why are hormone studies important for psychology?**

Hormone administration is a nice way to perturb the system and influence basic mechanisms. We are not as interested in the psycho-pharmacology as such, and to us, it is a useful tool to understand the basic mechanisms underlying decision-making. For example, in one study we found that testosterone does not affect risk taking when participants are playing gambling games, the standard task used in decision making to study risk, but in a more social setting, such as when deciding to trust somebody, that's actually where testosterone plays a role.

### **Was the conference useful?**

I found it very useful. In a small country such as the Netherlands, it is good to bring together the people that work in the same area of research. Of course, here it is also practically possible whereas in the US it's much more difficult to have these informal meetings. The people from my lab found it particularly useful because people came well prepared, with an open mind, and were willing to discuss. I am not an expert on hormone studies and it was very useful to get an overview of what has been done and sometimes there is surprisingly similar research being done 100 km away that you would otherwise find out only after the paper has been published! It was also good to hear other labs' research plans.

### **If you had to choose *now* between taking a shot oxytocin or testosterone, what would it be?**

Hm, I think I would probably choose oxytocin. I have a very busy week scheduled, and so it may calm me down a bit, make sure I stay socially aware, and make me work more efficiently in the coming days!