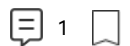


Meet the neuroscientists aiming to help Liverpool thrive at set pieces by attaching electrodes to Salah's head



By James Pearce (/author/james-pearce/) 1h ago



“This is the next frontier in athletic performance,” declares Dr Niklas Hausler. “The physical side in football has almost been maxed out. These guys are super fit. The next step really is to directly train the brain. That’s where we come in with something that’s scientifically validated. This is our dream and this is our first big interview talking about it.”

German neuroscientist Hausler and his friend and business partner Patrick Hantschke are Liverpool’s secret weapons in their mission to regain the Premier League (<https://theathletic.com/premier-league/>) title. They are the co-founders and CEOs of Potsdam-based neuro11, which helps athletes improve precision by reaching their optimal mental state.

Their methods have proved successful in basketball, golf, darts and archery but it was their passion for the training programme they developed for footballers in dead ball situations which led them to a meeting with Jurgen Klopp at Melwood two years ago.

From employing specialist throw-in coach Thomas Gronnemark (<https://theathletic.co.uk/1179263/2019/09/09/andy-gray-criticism-i-actually-felt-sorry-for-him-liverpool-throw-in-coach-gronnemark/>) to enlisting the services of German surfer Sebastian Steudtner to work on breathing exercises with his players, Klopp is always looking for innovation and marginal gains. Klopp liked what he heard from his fellow countrymen as he sought to improve Liverpool's output from set-pieces.

The global pandemic put the partnership on hold but it finally got underway in August when Hausler and Hantschke were invited to do some sessions at the club's pre-season training camp in Evian, France.

Mohamed Salah (</player/premier-league/liverpool/mohamed-salah-mahrous-ghaly/>), Trent Alexander-Arnold (</player/premier-league/liverpool/trent-john-alexander-arnold/>), James Milner (<https://theathletic.com/player/premier-league/liverpool/james-milner/>) and Harvey Elliott (<https://theathletic.com/player/premier-league/liverpool/harvey-elliott/>) were among those to embrace having electrodes attached to their head so data could be collected and individually-tailored programmes created.

It's an ongoing arrangement but the early signs are promising — Liverpool's tally of five goals from corners in the Premier League so far this season is more than any other top-flight team.

"We're proud of some aspects but there's still a lot of work to do," Hantschke tells *The Athletic*. "It's a really big puzzle and we're just one small piece. We're an add-on to the other parts of training.

"Liverpool have made us feel very welcome and there's a nice working atmosphere at the club. Super professional but also a family feeling."

Both aged 33, Hausler and Hantschke have been friends since they first met at a football coaching camp organised by former FC Koln CEO Wolfgang Loos in the town of Bramsche in Lower Saxony when they were 10. Their lives took them in very different

directions.

“Patrick was always a better player than me,” smiles Hausler, speaking from his office in the start-up centre at the University of Bonn. “My parents are diplomats so I left and travelled the world, living and studying in Canada before doing my masters in neuroscience here in Bonn and then a PhD in psychology and neuroscience. I was able to publish a few peer-reviewed papers on how the brain works with regards to scoring goals and also with finance, focusing on reward, risk and loss processing. My dad was always updating me on how Patrick was doing.”

Hantschke joined the youth academy at then Bundesliga (<https://theathletic.com/bundesliga/>) club FC Energie Cottbus and the full-back worked his way up the ranks but left without making a first-team appearance. He ended up studying business and playing semi-professionally in Germany before retiring at the age of 27.



Andy Robertson prepares to take a corner against AC Milan at Anfield (Photo: Alex Livesey – UEFA/UEFA via Getty Images)

“I had a lot of friends playing either in the Bundesliga or the second division and I spoke to them about what they felt was missing training wise,” he says. “After Nik had finished his PhD I met him for a coffee and told him about the huge potential of what he was doing in neuroscience in professional sports. There was a lot of cognitive training already out there but the stuff Nik knew and the background he had was new. I felt like what we had together could make a real difference.”

Hausler was convinced after spending a month at RB Leipzig and another month working with the German Football Association.

“That’s when I saw what was really possible,” he says. “Most of the research findings had come from precision sports like archery, darts, rifle shooting and golf but we were like, ‘okay, that’s valuable, let’s take this stuff and put it into football.’ We had to transfer it as that was our identity.

“We developed a whole training procedure and analysis to improve mental states and as a result increase precision. That’s what we call our ‘neuro11’ brain training.

“In Germany we sometimes say that science is done in an ivory tower. It’s always fun to do research in a lab but Patrick was like, ‘no, we need to bring this on to the pitch and it has to be fun for the players’. He had a huge role in this. Together with the University of Bonn, we applied for and secured funding from the EU and from the German government. With my background in neuroscience and Patrick’s in elite football and business, it’s a good mix.

“When you have something new that promises big results people are always sceptical. But the starting point for explaining what we do is that we’ve all experienced either in sports or in daily life that sometimes we’re more in the flow, more in the zone, than at other times. When it comes to the real details, we only discuss that part when clubs are interested and really open to training that part of the game.”



Hausler (left) and Hantschke (right) first met at a football camp in Bramsche when they were 10

The duo certainly set their sights high after launching the company in 2019. There was one manager they wanted to reach out to first.

“It was Jurgen,” says Hausler. “I’d read a lot of articles about his time at Liverpool and it was clear he focuses a lot on the mental side of the game. I wanted to see if he was interested.

“It took a while but Patrick’s former academy coach from Cottbus, Ulrich Nikolinski, made it possible for us to contact Jurgen and we were very thankful for his help.

“I sent Jurgen a text and it was just huge when he called us back and invited us to Melwood. It was during a really intense period of matches so it showed there was genuine interest in this. I knew that something special was going on here.”

Hausler and Hantschke flew over to Merseyside to pitch to Klopp and assistant boss Pep Lijnders (<https://theathletic.co.uk/author/pep-lijnders/>). They also attended the League Cup tie with Arsenal (<https://theathletic.com/team/arsenal/>) at Anfield which Klopp’s side won 5-4 on penalties after a thrilling 5-5 draw.

“That night was incredible — at Anfield it felt like every scene, every tackle, even every throw-in was being cherished. The fans were so on point,” recalls Hausler. “We’d talked to Jurgen and Pep about our training methods and we showcased it with one of the players. I’d like to think we performed when it really mattered. It was all agreed but then the pandemic hit. As a start-up company, that was a tough time.

“We stayed in touch and we were grateful for Pep’s role in that. We were told that as soon as it was possible they’d make it work. They were true to their word when we went to Evian this summer.”

Hantschke adds: “During the pandemic it was hard to stay motivated but we used the time wisely to improve what we were offering.”

Liverpool released a short video of Hausler and Hantschke collecting data as players wore headsets that recorded their brain activity as they practised set-pieces during the training camp. Lijnders was among those watching on.

“Jurgen and I really believe in these two guys and their concept. We believe in the stimulus they give,” says the Dutch coach. “They give the right input for players to find the right flow and, with this, more accuracy. They help with putting the players in the right frame of mind and how to reset.”

Hausler came away from Evian energised by how their contribution had been embraced by staff and players alike.

“You could see the high quality of Liverpool in what they created in that camp,” he says. “Every single thing was mapped out — processes and thoughts behind everything. That’s what we love coming from a science point of view.

“It was clear that Jurgen and his staff really trust us and that’s a big deal in order to deliver 100 per cent of our training. We were there for a couple of days and we put on a couple of sessions. We were able to show our true value. What defines elite players is that they are always able to see there’s room for improvement and that’s certainly the case with Liverpool.

“I look into every set-piece in every Liverpool game in high detail. That’s our job. There have been some good moments so far this season but it’s definitely not perfect.

“Any team can train free-kicks but what we do is put the mental part on top of that. It’s an add-on to make it more efficient and hopefully get better results. Evian was a great experience for us but we can’t go into much more detail on that or talk about the plans going forward.”

That’s where confidentiality in terms of the finer points of their work with Liverpool kicks in. There’s also a reluctance to give away their secrets as their methods could be copied by others.

But what they promise is to help players “control their brain when it matters most”. How is that achievable when pressure and fatigue are kicking in?

“It’s a good question and I’ll try to explain it in a general way,” says Hausler.

“Each human has certain brain states. Sometimes we’re more relaxed, sometimes we’re more agitated. Everyone is like that. What research has shown is that in either case whether you’re too relaxed or too agitated it can be sub-optimal to get what we call ‘in the zone’.

“When you are able to perform at your best, you let your motor output run automatically. You don’t have to think about it, it’s just happening. For example, you can’t think about a recent fight you’ve had with someone when you are supposed to be focusing on a free-kick. That would be counter-productive.

“What we do with a player is we decipher with them and figure out what parts of this process help him or her to get into that brain state. They might think there’s a best way to do it but our data then shows that in fact that’s something you shouldn’t really focus on and instead you should put your emphasis on something you under-estimated before.

“That’s how step by step we try to fine-tune it so in the end, the player has a mental tool so it doesn’t matter whether it’s a free-kick in training or a free-kick in the 93rd minute of the Champions League final, you know what you should focus on and you don’t get disorientated.

“Everyone has their own mental processes. Some will focus on say the ball more, others on the wall, others on the target itself. Everyone has different things that can either help or distract.”

There was one recent example at a low level in Germany that thrilled Hausler.

“I’ve been working here in Bonn with a friend of mine who plays in the seventh tier of German football,” he explains. “He’s the captain and he takes the free-kicks.

“After coming back from vacation, he had a game straightaway. He hadn’t practised them and then in the game he dislocated his finger. He had to go off so the physio could put it back into place and when he came back on there was a free-kick. He put it perfectly into the corner and they won the cup final 1-0.

“I told him that’s exactly what we’re looking for. He was able to block out the pain he was in and still score the free-kick. That’s the kind of thing that can result from this kind of training.”

So exactly what data is being recorded from those headsets and why does their work only apply to set-pieces?

“By attaching electrodes to the head we can measure brain states,” Hausler adds. “Both during and after training we analyse the data and give feedback, finding out what parameters of his procedure truly help him to get into ‘the zone’.

“That’s as much as I can say right now. I wish I could tell you more but if I did Patrick would say ‘shut up Nik!’”

“The neuroscience behind it means we can only focus on set-pieces. We are measuring very sensitive data with electrodes. Any kind of movement is an artefact so someone has to be still initially.

“But there’s a big discussion going on out there. It’s very likely that as you get to know yourself better, you get to know your mental tools, maybe next time you are very angry, you understand that when you’re very agitated you don’t perform as well so that can help a player in open play too.

“It’s that ability to tell yourself you need to chill out to avoid making bad decisions, like stupid fouls or silly mistakes. It transfers but it would be unscientific for me to say it transfers to open play 100 per cent.”

With the scrapping of the away goals rule in European competition, Klopp knows that penalty shootouts are likely to become more prevalent. And that’s another area where neuro11’s expertise can help.

“You can’t re-create a real high-pressure situation but you can give a player the right tools to be prepared for that,” says Hausler. “It’s like in training when you practise two-v-one situations so in a game you can perform at your best. We provide these tools so when a penalty comes up you are able to deal with all the distractions around you and you know exactly what to do to score that goal.

“I’d be the happiest guy in the world if a player we’ve worked with scored a penalty to win a final in the 93rd minute by following their own mental abilities.”



Alexander-Arnold lines up a free kick for Liverpool against Brentford (<https://theathletic.com/team/brentford/>) (Photo: Andrew Powell/Liverpool FC via Getty Images)

Neuro11 offer an online seminar and in recent months the company has attracted increasing interest from both club and national teams wanting to learn more.

Klopp has described their business as “highly innovative.... fact-based mental strength training”, adding: “Since mental strength plays such an important role at the highest level, we’re excited about working together with these guys.”

It’s a partnership that Hausler is confident will continue to blossom as neuro11 develops and expands.

“Founding a company like this 20 years ago just wouldn’t have made any sense but now this is only going to grow in terms of interest and importance,” he adds.

“Just look at Netflix and how many documentaries there are on the mental side of sports. Clubs have already embraced psychology and now you have neuroscience coming in and providing added value. The science behind it is getting better. We’re able to decipher better what’s relevant and what’s not.

“Our vision is to become the number one contact for neuroscience and brain training in sports. We also want to show that everyone out there can control their brain and their behaviour and provide a platform to improve daily life.

“We owe a lot to Jurgen Klopp for the faith he’s shown in us. We want to keep repaying that with our work for Liverpool.”

James Pearce ([author/james-pearce/](#)) joins the Athletic after 14 years working for the Liverpool Echo. The dad-of-two has spent the past decade covering the fortunes of Liverpool FC across the globe to give fans the inside track on the Reds from the dressing room to the boardroom. Follow James on Twitter [@JamesPearceLFC](#) (<https://twitter.com/JamesPearceLFC>).