# Semi-structured interview Cybathlon 2020 – “x-OPRA” pilot

## I. Introduction

The *Researchers* performed the following semi-structured interview at the Center for Bionics and Pain Research (CBPR) laboratory, Gothenburg, Sweden, on the 6 of September 2021. The interview was video recorded under the authorization and consent of the *“x-OPRA” pilot*.

The interview started with the *Researcher* explaining to the *Pilot* the aim of the semi-structured interview. The aim was to obtain pilot’s perception about his experience at the Cybathlon competition 2020 and the impact it has had on his prosthesis use and his life.

Portions of the interview were conducted in Swedish and later translated to English for the purposes of this transcript. The transcript was also lightly edited for grammatical clarity and to remove personal details.

## II. Questions:

**Researcher**

What is your opinion on the prosthesis that you used for the competition? What do you like about that hand? What do you not like about that hand?

**Pilot**

I trust it. It has good grip, and it’s fast.

**Researcher**

What is it about the Greifer that you put your trust in?

**Pilot**

I have a better grip. With the other hand, I drop things. This is stronger.

**Researcher**

Yeah, it's a very useful system, certainly. What would you say are the strengths of the system that you have? Not just the Greifer, but also the osseointegration, the control algorithms?

**Pilot**

The movements, I can trust them. Its feels like my own arm.

**Researcher**

How do you like the way that you control the prosthesis?

**Pilot**

It comes naturally. I just think.

**Researcher**

What would you say are the weaknesses or the drawbacks of the system?

**Pilot**

Before it was the battery. It is better now.

**Researcher**

Are there things that you feel that you cannot do with your prosthesis?

**Pilot**

No.

**Researcher**

You could do anything?

**Pilot**

Yes, almost. Yeah

**Researcher**

Before you were given a rotating wrist, what are some of the activities that you typically used your prosthesis for? So, for example, gardening, housework, cooking?

**Pilot**

Everything. Work, fixing cars, putting on clothes.

**Researcher**

Do you do housework? (To the pilot's wife) Does he do housework?

**Pilot**

(Laughter) Sometimes?

**Pilot's Wife**

Yes, sometimes.

**Pilot**

I do the dishes.

**Researcher**

How is your cooking?

**Pilot**

Mmm, not so good. (Laughter) But I made a fantastic lasagna last week.

**Researcher**

After we gave you the rotating wrist, which was around July of last year, are there any new activities that you are able to do because you have that wrist, that you couldn't do before?

**Pilot**

No. But it's easier to get a good position of my arm. Yeah, it helps a lot.

**Researcher**

Are there any activities that you stopped doing now that you have that wrist? Is there anything that you used to do, that you don't do anymore?

**Pilot**

No.

**Researcher**

Has the wrist been detrimental? Has it caused problems as you've used it?

**Pilot**

No.

**Researcher**

The wrist always responds as it's supposed to?

**Pilot**

Yeah.

**Researcher**

Okay. I'm happy to hear that.

**Pilot**

Sometimes, it would open when I supinate. But I knew it would happen, so it's no problem.

**Researcher**

If you're like positioning your hands to grab on to something, do you supinate and pronate about equally? Or do you have one that you prefer over the other?

**Pilot**

Maybe pronate more.

**Researcher**

And why is that?

**Pilot**

I think is easier to do that one. But it's not a big difference.

**Researcher**

When you were practicing for the Cybathlon, I know our dear friend Andrew was very impressed with the amount that you have been practicing and training for the events, like Rocky [Balboa] on the stairs. So, how did you train for the Cybathlon?

**Pilot**

At home, I trained with the cups, the scissors… Almost everything, I think.

**Researcher**

Did you feel that, while you were training for the Cybathlon, you used your prosthesis more often or less often?

**Pilot**

Yeah, more often. I pushed myself to use it more.

**Researcher**

What are some ways that you use it more outside of the training with the cups?

**Pilot**

Open doors, operating lights, eating. Tying my shoes.

**Researcher**

Are those things that you would normally do? Or did you do them because you're training?

**Pilot**

Before I was training, my wife always tied my shoes. But now, I'm a big boy and I do it myself. (laughter)

**Researcher**

No more Velcro for you. (laughter)

During that period while you were training for the Cybathlon, did you see any changes in how your control of the prosthesis has changed?

**Pilot**

Yeah, it was much better.

**Researcher**

Why do you think you got better? Do you think it was better because you were training and practicing?

**Pilot**

Yeah.

**Researcher**

Do you think it also improved because of changes that we made in the lab?

**Pilot**

Yeah, that too. Training and the changes.

**Researcher**

Which of those two do you think had a bigger impact on your control now?

**Pilot**

Training, I think.

**Researcher**

And when you say that your control improved, in what way would you say that it improved?

**Pilot**

I think my [control] signals were better when I was training.

**Researcher**

Did the hand react the way that you would expect it to more or less?

**Pilot**

Yes, more.

**Researcher**

You are using the prosthesis in a lot of different ways. Ways that you hadn't used it before. Did you try to use the prosthesis at different speeds and in different arm positions? Or did you feel that you basically use it the same way?

**Pilot**

The same way. But I use it more.

**Researcher**

How did the Cybathlon influence your perception of your prosthetic system, the way that you view it, the way that you feel about it? Do you like your prosthesis more now, having been part of the Cybathlon, or would you say that you feel about the same about it?

**Pilot**

More, I think.

**Researcher**

You said that while you were training you use the prosthesis more. Do you feel that you use the prosthesis more now than you did before the Cybathlon?

**Pilot**

Yes.

**Researcher**

Do you consider the prosthesis more a part of you, now?

**Pilot**

Yeah.

**Researcher**

Have you always considered the prosthesis to be a part of you?

**Pilot**

No. But after the Cybathlon, I felt it.

**Researcher**

How did you view it before?

**Pilot**

Like the prosthesis was not a part of my body.

**Researcher**

Even when you had the osseointegration, it was still a tool?

**Pilot**

Yeah.

**Researcher**

And what was it about the Cybathlon that helped you to view the prosthesis more as a part of you?

**Pilot**

Because I use it more and I forced myself to use it. Yeah, I think it was that.

**Researcher**

So, one of the things that we have been working on for a while now with your prosthesis, is not only giving you the ability to open and close and to rotate, but to do both of those at the same time. So, for example, to grab onto something and close the hand or close the hand and rotate. How often would you say that you use that functionality?

**Pilot**

Everyday. Although maybe I just grab something and then rotate.

**Pilot's wife**

No, but I saw you do that the other day.

**Pilot**

But I don't think about it.

**Pilot's Wife**

That's the point. Just in the last weeks, he been doing it like this (moves her arm in a wide arc while pronating her hand) to grab something. And it goes naturally.

**Researcher**

Could you demonstrate that?

**Pilot's Wife**

Like reaching for something like this (moves her arm in a wide arc while pronating her hand), and before it was like this (first moves her arm more slowly, and then pronates her hand after moving).

**Pilot**

I don't think about it.

**Researcher**

You don't think about it. Okay. Very interesting. The fact that you're doing that while your arm is moving as well, is very good.
A while back, since the Cybathlon had finished, would you say that you still used the prosthesis the same amount?

**Pilot**

Yeah, I think so.

**Researcher**

Did you continue training after the Cybathlon?

**Pilot**

After the Cybathlon, I maybe used my non-affected arm more. Before, I forced myself to use my prosthesis.

**Researcher**

Are there things that you continue doing now that the Cybathlon is over, that you haven't done before?

**Pilot**

Yeah, tying my shoes.

**Researcher**

Making lasagna. (laughter)

**Pilot**

Yeah. And I work more with my two hands.

**Researcher**

So, your prosthetic hand has the ability to open both slowly and quickly, and everywhere in between. How would you say that your control of that speed was before you started training for the Cybathlon?

**Pilot**

I think it was good.

**Researcher**

Do you think you used a lot of different speeds when opening and closing the hand?

**Pilot**

Yeah, sometimes.

**Researcher**

And do you think that carried over into the Cybathlon?

**Pilot**

I think is the same.

**Researcher**

And then after the Cybathlon, you think it is also still the same?

**Pilot**

Yeah.

**Researcher**

So, the speed of the hands, your ability to move it fast and slow is the same? The improvements that you were talking about earlier are about basically not moving when you don't want it to and moving when you do?

**Pilot**

Yeah.

**Researcher**

You were saying earlier that when you supinate, sometimes the hand will open. Is that something that has been around for the entire time that you have had the wrist?

**Pilot**

Yeah, I think so. Yeah.

**Researcher**

Would you say that your use of the wrist has increased since the Cybathlon, or has been the same since you had it?

**Pilot**

Yeah, yeah it has been better.

**Researcher**

For all of the things that you have with your arm, if you could improve something about it, what would you improve?

**Pilot**

The fingers. I want to add few fingers.

**Researcher**

Why do you want to add the finger movements?

**Pilot**

Silly question! (laughter) So I can take small things like a credit card, everything. It feels more natural. And maybe my phantom pain can disappear if I can move my fingers.

**Researcher**

On the topic of phantom limb pain, do you feel like your training for the Cybathlon has had any influence on your phantom pain?

**Pilot**

No.

**Researcher**

It was the same?

**Pilot**

Yeah. Maybe more when I trained a lot … right? (He looks questioningly at his wife)

**Pilot's Wife**

You slept way better when you were here and trained. Then you didn't have pain.

**Pilot**

True, in the hotel. But I always slept better in hotels.

**Researcher**

But then since training, it has gone back to the same level it was before?

**Pilot**

Yeah.

**Researcher**

Last year, you had come into the lab many times leading up to the competition. Do you feel that training at lab was helpful?

**Pilot**

Yes.

**Researcher**

Or was the training at home the main helper?

**Pilot**

I think both.

**Researcher**

What was it about the lab training that you found helpful?

**Pilot**

Maria and Andrew pushed me a lot. My confidence is better. And Jan did some changes in the system.

**Researcher**

If you have the chance to change something in the way that you trained for the Cybathlon, what would you change?

**Pilot**

I think nothing.

**Researcher**

And in what ways do you think that our team can improve for the next Cybathlon?

**Pilot**

I don’t know

**Researcher**

More Andrews and Marias? (laughter)

**Pilot**

No, I think you did a good job.

**Researcher**

Oh, thank you.

**Pilot**

Maybe more practice with [the “e-OPRA” pilot]. We can help each other.

**Researcher**

During the actual Cybathlon competition, did participating in the competition match your expectations?

**Pilot**

Yes, but I thought it would be in Zurich. (laughter).

**Researcher**

For you, what were the highlights of the entire experience?

**Pilot**

When [the “e-OPRA” pilot] came on the 3d place.

**Researcher**

Overall, what do you think is the impact that the Cybathlon has had on your life?

**Pilot**

My confidence has been much better.

**Researcher**

The confidence in your control?

**Pilot**

Yeah, and standing in front of a camera and a lot of people... and I trust my prosthesis more.
And I got a new friend.

**Researcher**

Who is it?

**Pilot**

[the “e-OPRA” pilot] (laughter).

**Researcher**

What was the biggest challenge for you participating in the Cybathlon?

**Pilot**

The camera and the people. But it was not as hard as I thought.

**Researcher**

And lastly, would you participate in the Cybathlon again if you had the chance?

**Pilot**

Yes.

**Researcher**

I think that was everything, thank you.