A game-based digital intervention to rebuild number skills in aphasia
Dr Caroline Newton and Dr Carolyn Bruce, UCL
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Talk Transcript – Dr Caroline Newton

Hello, I'm **Caroline Newton** from the **UCL communication clinic.** Thank you for coming to our talk about a **digital intervention** to help with **number difficulties**.

Lots of people with **aphasia** have problems with **numbers** and it might seem like quite a small thing, but actually, we know that these **difficulties** can have a **big impact** on **daily life**.

Maybe that's something you **experience**. Perhaps that means you find it really **difficult** to do things like taking your **temperature**, or making sure you're taking the **right dose** of medicine. Or you might have **problems** following a **recipe** or **checking** the **score** of your **favourite team** or player. You might find it difficult giving someone your **phone number**. Or maybe you go to the corner shop to **buy** a **newspaper**, and you hand over a **note** that you know is **much more** than the **cost** of the paper. And you **rely** on the **person** at the **till** to give you the **right change**.

Difficulties with **numbers** are often **overlooked** in **therapy**, partly because we're at the **early stages** of **understanding** how **number skills recover** after **brain injury**. Also, because it can sometimes be difficult to access therapy, other problems might be prioritised, and worked on.

Our research team is interested in whether using **digital games** as part of **therapy** may offer a **solution** to these problems.

Games, that you can play on phones and tablets, offer lots of **practice** on **specific exercises** at a **convenient time**. So, it allows us to **target particular number skills** that we think are important. And we know that lots of **practice** is a really **good thing**. Also, the **game aspect** of it makes it more likely that you'll **stick** with the **programme** and get the most help.

This **SWAN team** is made up of **researchers** at **UCL**, **software developers**, and **clinicians**, as well as **specialist teachers** and people with **language problems**.

Together, we've developed a **game** called **SWAN** that people can play on their **phone** or on a **tablet**. The **game** is based on our **theoretical knowledge** of how we **first learn** about **numbers** when we're **children**. And we think that this **theoretical knowledge** could apply to **rebuilding number skills** after a **stroke**.

We're going to show you a **clip** of the **game** being **played**, so you can get an idea of what it looks like and how it works

*Clip shows the game being played on screen
– the numbers are spoken as they are highlighted on the screen*

The **aim** of our **game** is to **enhance** what's called **basic number knowledge**. And it **focuses** on **two particular skills** which we know are important.

First, the **count word sequence**, like when you **count objects aloud**, just as you saw in that clip.

And then second, **making** the **link between** that **spoken sequence** of **numbers** and their **written Arabic numerals**. So numbers you see written down on a page or on the screen. And again, you should have heard in that clip, the numbers being named.

There are lots of **levels** to **work** through. And the idea is that the **game** gets more **challenging**, and **develops new skills** as you **work** through the **levels**.

Unlike other **computer therapies** that use **game elements** alongside the intervention, so maybe giving you rewards when you make progress. In **SWAN**, the **intervention** itself is the **game**. And the idea is that that makes the **therapy** more **engaging**. We hope.

We're carrying out a **study** at the moment to test how **effective** our **game** is in **improving number skills** in **adults** with **aphasia**. So we're giving people the **game** to **play** for a **few weeks** at **home**. And we're asking them to carry out some **assessments** of their **number skills** **before** and **after** the **therapy**.

We've already had a **small group** of people **try it** out, and we thought you'd like to hear what they made of it. So here's **Rose** talking to my colleague **Carolyn** about how the **game** got **harder** as she worked through the levels.

Interview with study participant Rose

Rose: One is easy, but got to go one, two, three, okay. And go one, two, three, three, two, one, okay. So I understand now, there is ups and downs. So one day it's one game.

Carolyn: Okay, so going backwards as well as forwards.

Rose: Yes.

Carolyn: So there were certainly different things that you needed to do.

Rose: Early is easy, okay, but the games as they go up, is difficult.

Carolyn: Okay, good. Alright, so you found it got more challenging as you…

Rose: Yes.

You'll remember that one of the things we hoped from making the intervention a **digital game** was that it would mean **people** would **enjoy** it and **play** it a lot. Well, here is **Jawad** describing **how** that **worked** for him.

Interview with study participant Jawad

Jawad: For the numbers.

Carolyn: Yes

Jawad: I like that. And every time I doing… maybe the lady, she said, half hour, but maybe I just two hour on both. Yeah. She said it is finished.

Carolyn: Oh, okay. So actually you could work on the game for even longer.

Jawad: Yeah.

In the **future**, we hope to **expand** our work to **large scale trials** with **bigger groups** of **participants**. The **long-term aim**, of course, is to help **improve** the kinds of **everyday difficulties** with **numbers** I described earlier.

If you want to **know more** about the **projects**, or you're **interested** in **taking part** because you have the kinds of problems I've been describing, then there's more information on our **website**.

And we look forward perhaps to **chatting** with you more and **answering** your **questions** at the Q&A sessions. Thank you for watching.

Glossary

Aphasia: Aphasia is a communication disorder that affects expression and/or understanding of speech and language.

Sequences in Words And Numbers (SWAN) project team, UCL
https://www.ucl.ac.uk/pals/research/language-and-cognition/language-and-cognition-research/swan