Project

Research issue

Sequence Learning is an innate process of basic cognitive elaboration that allows the detection and extraction of the regular sequential patterns of stimuli present in the environment. It emerges automatically as a consequence of mere experience and can work beyond awareness (implicitly). It is fundamental for language acquisition, and it is delayed in children with language-based impairments. The high variability in spoken language outcomes in deaf children after cochlear implantation is believed to be partially explained by grade of the efficiency of this process.

Research objectives

The research project "Sequence Learning in deaf children after cochlear implantation" consists in the investigation and training of sequence learning skills in deaf children who wear one or two cochlear implant/s using a serious game adapted for tablet devices. Correlations between the sequence learning training and changes in linguistic skills will be explored.

Serious games

The prototypes of three mini-games for tablet devices have been designed and implemented as part of the serious game. "Run and Jump", "Complete the Sequence", and "Avoid the Asteroids" were implemented using Phaser, a desktop and mobile HTML5 framework. The games use visual and auditory sequences of stimuli to target both implicit and explicit learning processes. The sequence and rating of appearance are artificially regulated and reaction times of the participants are registered.

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# Sequence Learning in deaf children after cochlear implantation

Run and Jump

In this 2D platform game, an avatar walks in the countryside of a fictional planet where the green rolling hills are under the effect of gravitational forces.

In order to reach the end of the level, the player must guide the avatar through a series of obstacles by pressing and holding the jump button. Obstacles can vary in height and are constituted by one, two, or three wooden crates piled one on the top of the other. Coins can be collected to motivate the player throughout the level.

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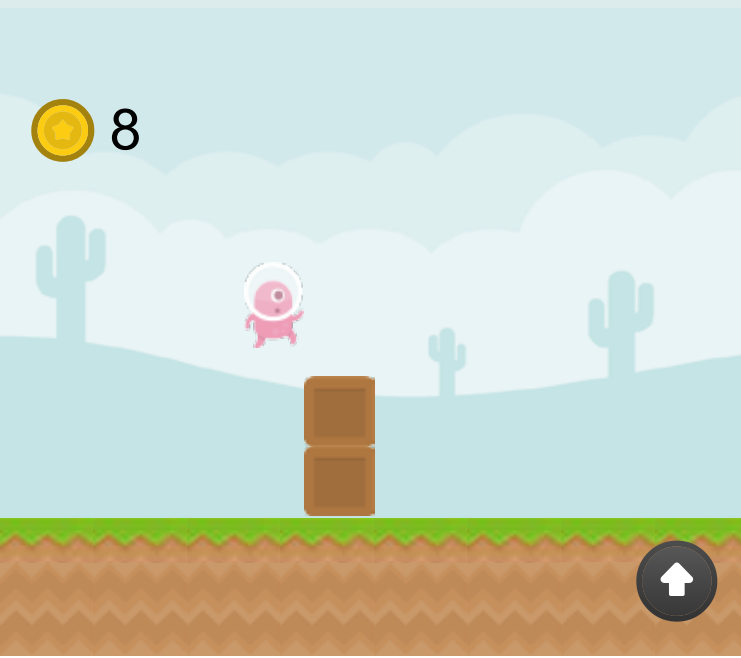
Complete the Sequence

In this game, twelve pictures of animals are forming the edges of a coloured circle. Sequences of 3-5 animals highlight sequentially, one animal at a time. Each animal is named by a recorded female voice.
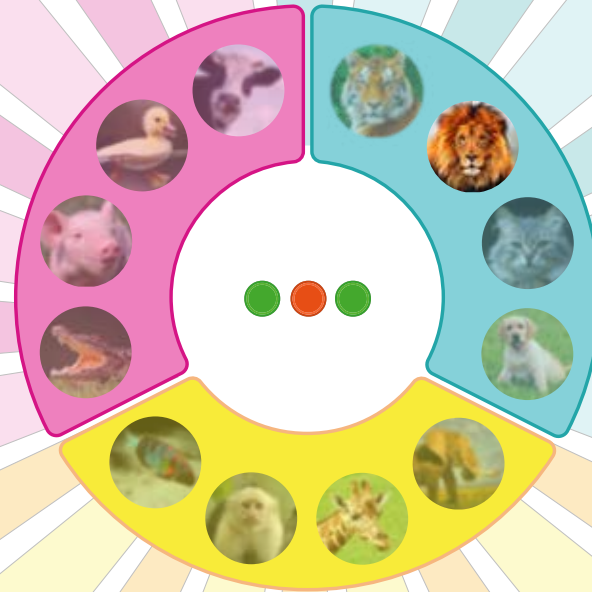
Immediately afterwards the sequence is repeated, but some animals are missing.
The player is asked to remember which animal is missing and tap it in order to complete the sequence.

Avoid the Asteroids

Avoid the asteroids is an endless runner game in which an alien spaceship must drive through walls of asteroids. Openings can be located at different heights. A collision with the walls equals an unsuccessful passage.

The player can press the "up" and "down" buttons of in order to assure the avatar a safe passage through the asteroids. Coins can be collected to motivate the player throughout the level.

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