

# Chapter 5

## IKeWYSe: I Know What You See

### ABSTRACT

*The first product of the project presented here was a prototype of video games, named IKeWYSE, which constituted the data collection tool for the experimental research project. The videogame prototype realized requires the user to navigate in a three-dimensional space through an avatar. User deals with three different tasks, two of which are designed to measure the skills of perspective taking, while the third task is calibrated on the ability of mental rotation. The default point of view is a semi-subjective view with the camera following the avatar. The player has the option to select other views, going through semi-subjective, subjective and objective point of view. The game was tested between January and March 2015, with a group of 70 children, 35 males and 35 females, from the third, fourth and fifth primary school class and from a first secondary school class of the Istituto Comprensivo San Valentino Torio, in the province of Salerno. Each user performs 10 attempts for each task. The software records the beginning of each game, the user data (age and gender), and, during the game, time for each attempt and the result (success / failure) of the attempt. The present chapter presents the research design, the path for design and development of the videogame, the methods for data collection and discusses the results obtained.*

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## INTRODUCTION

The scientific debate on the relationship between perceptive egocentrism and perspective taking has focused on two main factors. First, the age when the child leaves perceptive egocentrism. The disagreement between the various positions is strong, and results in sometimes very distant evaluations. If Piaget suggests a “window” of time between 6 and 11 years of age, other scholars, based on different experimental trials, have supported different thesis, moving the threshold to five, four, and even three years (Rochat, 1995).

In addition, the ability of perspective-taking, taken individually, does not seem sufficient to demonstrate the ability, in the child, to have a coherent representation of the space, to allow the manipulation of viewpoints. Berthoz, in this regard, relates the abandonment of perceptive egocentrism with a more complex mechanism than the perspective-taking.

This mechanism consists in the possibility of performing a mental rotation on ourselves by maintaining a main perspective of the environment (Berthoz, 2011b).

According to Berthoz, leaving perceptive egocentrism resides in the ability, based on the mental rotation skills, to simultaneously use egocentric, allocentric and heterocentric perspectives.

Secondly the gender difference plays a key role in spatial thinking. Berthoz summarizes:

*Numerous data in the literature provide evidence for gender differences in spatial orientation. In particular, it has been suggested that spatial representations of large-scale environments are more accurate in terms of metric information in men than in women but are richer in landmark information in women than in men. (Lambrey & Berthoz, 2007)*

Criticisms of Piaget from Hughes and Rochat demonstrate the difficulty in conceiving paradigms of research on the topic. In this sense, the evolution of digital systems for the representation of space provides valuable tools for building effective instruments.

Starting from this assumption, the present research project intended to investigate the relationship between age, perspective taking skills and mental rotation, and the relationship between gender difference, perspective taking skills and mental rotation.

The hypothesis about the relationship between age and skills under investigation, gained in the study of the scientific literature, is that these skills

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