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# Interaction Human-Robots: A methodological proposal to evaluate activities performed by robots with older people

## 1. Background

New assistive technologies is a challenge for an ageing society and a possible response to the needs of older people in the care process and an instrument to promote social interactions and active ageing (Kachouie; Sedighadeli; Khosla & Mei-Tai Chu, 2014; Robinson; MacDonald; Kerse & Brodbent, 2013; Kidd, 2006).

The relevance and interest in the study of interaction between elderly and robots may depend on the choice of activities that robots can developed and how important it is for older people, a task that requires coordinated research between computer engineers and specialists in the humanities and social sciences.

Being a recent research area it is particularly relevant to select carefully the behavioral variables analyzed, the methodology adopted and the instruments that allow rigorous evaluation (Joshi, 2017; Kachouie; Sedighadeli; Khosla & Mei-Tai Chu, 2014)

## 2. Problem/Question

Social Assistive Robots can contribute to a positive impact in elderly well-being and active ageing?

## 3. Intervention: The EuroAGE Project

The EuroAGE project aims to develop innovative initiatives for the promotion of active aging in the EUROACE Region and the specific objectives are:

- Increase innovative initiatives based on the technologies and knowledge developed by the partners;
- Promote active aging;
- Optimize resources in public health systems and social support, modernizing the sector's business.

## 4. Study design

The methodology of the study is mixed (qualitative and quantitative), being organized as an exploratory case study. Data collection is based on naturalistic observation but variables are quantitatively assessed in a pre/post-test design.

### 4.1. Sample

- 31 elderly residents (10 men and 21 women), aged between 64 and 98 years, in a Portuguese nursing home.
- The psychologist, the cultural animator and the director in the nursing home .

### 4.2. Instruments

a) Ficha de Observação das Interações e Atividades em Estruturas Residenciais para Pessoas Idosas (Registration form of Interactions and Activities in Residential Structures for Older People - Adaptation of Bertram, T; Pascal, C. (2009). Manual DQP – Desenvolvendo a Qualidade em Parceria. Lisboa: Ministério da Educação).

This instrument allows evaluating three variables that indicate interest and participation in the activities taking place in the institution: initiative, involvement and social interactions. It has been used to assess quality in different contexts.

b) Semi-structured interviews with the elderly in order to identify the following parameters: activities developed at the institution, preferred activities, activities and games that they would like to perform.

c) Semi-structured interview with professionals with the objective of identifying the following parameters: identification of daily routines; activities implemented by cultural animator and psychologist; interaction mode (individual or group); activities preferred by the elderly; evidence of the initiative of the elderly in the proposal of other activities; attitude of the elderly in the activities.

## 5. Research results

The first implementation phase of the project identified:

- The routine activities organized by the technicians of the institution;
- The activities in which each individual participates on its own initiative;
- The interests and suggestions of other activities the elderly would like to participate in interaction with a social assistive robot.
- The levels of prevailing social interactions, involvement and initiative in activities obtained of each elderly.

Table 1. Averages obtained by the group of 31 elders in the variables "involvement" and "initiative"

Involvement	Initiative
3,2	2,7

- The averages obtained by the group were slightly above the midpoint in the variables "initiative" and "involvement";
- 29 % of elderly were identified that had a level of 2 or less in the "involvement" indicator on a five-point scale;
- 30% of elderly presented initiative levels equal to or less than 2 on a four-point scale;
- 30% of elderly show good levels of autonomy, ability to interaction and involvement;
- It was also possible to identify a relationship in the results obtained in the dimensions "involvement" and "initiative", that is, the elderly who demonstrate more involvement in both the activities suggested by the technicians and those selected by themselves are also those that show a greater initiative in the regulation and selection of activities performed.

The adopted methodology allowed to confront the narratives of the elderly and the professionals about the needs and interests of each elderly, and to classify the participants on the levels of prevailing social interactions, involvement and initiative in activities.

The sample is heterogeneous in terms of the parameters evaluated, but the results reinforce the need for mobilizing intervention of higher levels of activity in more than 50% of individuals, responding to the interests of the elderly. Based on these results, some social, cognitive and physical activities were selected to be developed by a social assisted robot.

## Conclusions

The research methodology allowed an objective characterization of the interest, type, level of activity and social interaction of each elderly by the fact that we triangulated the observation data with the quantitative evaluation of the variables considered and the data of the individual interviews to the elderly and to the professionals.

In this sense, showed its adequacy to be used to evaluate the results of the intervention with the robot in social assistive domains in promotion of social interactions, initiative and involvement in activities, important variables to an active ageing.

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## Keywords:

Social Assistive Robot; Active Ageing; Initiative; Involvement; Social Interaction.

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