Available online at www.sciencedirect.com

ScienceDirect

Procedia - Social and Behavioral Sciences 116 (2014) 2074 – 2077

Procedia
Social and Behavioral Sciences

5th World Conference on Educational Sciences - WCES 2013

Patterns of Motor Behaviour in the elderly

Marta Castañer & Gloria Sauch

Laboratory of Human Motor Observation. *http//lom.observesport.com/* INEFC, University of Lleida, Spain.

Abstract

The study sought to analyse the fluency of motor patterns that physical activity programs promote in elderly people. Nineteen physical activity sessions were studied using an *ad hoc* system (OSMOS_in context) of the Observational System of Motor Skills (OSMOS), an instrument that provides a clear analysis of how essential elements related to *motor skills* behaviours can be observed. A subsequent analysis based on the detection of T-patterns by means of *Theme v.5* enabled us to obtain sequential analyses of the motor behaviours used in elderly physical activities in Catalonia (Spain).

Selection and/or peer-review under responsibility of Academic World Education and Research Center.

Keywords: Motor skills; Elderly; T-patterns; Physical activity programs

1. Introduction

It is feasible to define and demarcate the occurrence of each one of the motor actions that go to make up the human movement under observation. From this perspective, motor behavior is regarded as a sequence of postures and kinemes (Castañer et al., 2012) of varying complexity that follow one another in time and are always expressed as motor actions. Within a chain of motor behavior it is possible to separate and demarcate the behaviors of varying origin provided that they are discrete and mutually exclusive.

The fundamental skills arise out of the combination of movement patterns that introduce the work of the body, both as a whole and in its various segments. While their roots lie in the phylogenetic contribution, their singular characteristics depend on ontogeny, on the developmental process of each individual. Nowadays there are varied programs of physical activity of municipal entitlement that promote the physical exercise in the elderly.

In order to answer which kind of movements these programs focuses to elderly people, we identify the variety of singularized responses produced with respect to the specific motor skills (Gallahue & Cleland-Donnelly, 2003) the specific ones (Castañer y Camerino, 2006) joint to perceptive and physical capabilities into a taxonomy of motor roles and profiles (Castañer et al., 2012), as natural contexts (Anguera, 2003).

In light of the above the present study aims to: (1) to construct an instrument for identifying and studying the variety of motor skills that elderly adults generate in programs of physical activity. (2) Identify t-patterns from the motor skills and perceptive capabilities that physical activity programs promote in the elderly.

2. Methods

The design for this study is I/P/M (ideographic/point /multidimensional) (Anguera, 2003). It is *ideographic* (several participants with a high level of motor interaction), *point* because we consider a single session with all the participants, and *multidimensional* because it combines a category system with a field format that enables us to

Corresponding Author: Marta Castañer , Tel: +23 444747839
Email: Marta Castañer @gmail.com

1877-0428
Selection and/or peer-review under responsibility of Academic World Education and Research Center.
doi:10.1016/j.sbspro.2014.01.522

manage six criteria that include eighteen exhaustive and mutually exclusive categories. The sample comprised 90 elderly people who regularly attended supervised exercise programs.

2.1. Instruments

The ad hoc system of OSMOS (Castañer et al., 2009) that fits to this study is OSMOS_in_context (Table1) covers, joint to the motor skills behaviours, perceptive capabilities and proxemic aspects (Castañer et al., 2010). Each criterion gives rise to a system of categories that are both exhaustive and mutually exclusive. Behaviours from the sessions were recorded using LINCE software (Gabín et al., 2012). The data were then imported into the THEME software in order to detect hidden T-patterns (the latter outlines a new approach to the analysis of time-based event records)

3. Results

We have obtained several T-patterns that show that continuous sequential actions exist in physical activity practice Figure 1 shows one of the whole patterns obtained for the total of the sessions. The pattern tree graphs must be read and interpreted in the following way. The upper left box of figure 2 shows the events occurring within the pattern, listed in the order in which they occur within the pattern. The first event in the pattern appears at the top and the last at the bottom. The upper right box shows the frequency of events within the pattern, each dot means that an event has been coded. The pattern diagram (the lines connecting the dots) shows the connection between events. The number of pattern diagrams illustrates how often the pattern occurs. Sub-patterns also may occur when some of the events within the pattern occur without the whole of the pattern occurring. The lines show the connections between events, when they take place and how much time passes between each event (Magnusson, 2000)

4. Interpretation

The analysis of the T-pattern of Figure 2 shows a dendrogram with a range between 7 and 8 configurations of actions and 4 connection levels or branches (Figure 2, upper left). The top right graph shows the high frequency of occurrence of each configuration as well as their sequential combinations. Hence, it is clear that the complete pattern occurs 2 times starting approximately halfway through the game (approximately from frame 10,000 onwards). Its duration can be seen on the lower right graph.The sequential configurations obtained are as follows:

(01) psychomotor role (PSY), as individualized practice; therapeutic with a little bit of competitive situation (TC); without material (WMA), practicing in a circle spatial topology (CIR); the whole group (MAC); the motor skill is locomotion (L) with limb coordination (LIC) and improving aerobic endurance (AE) It is associated to:

(02) the same configuration as the previous one changing that the situation profile is both, utilitarian and therapeutic; the group has several organizations (CSO); the motor skill is stability (S) and the physical capability is to stretch.

(03) this configuration is similar as (02) changing again to macro group formation (MAC) and locomotion motor skill (L)

(04) similar as the previous configuration changing to motor skills of both, stability and locomotion and including again limb coordination (LIC).

The interpretation of the results to us are that the motor patterns observed in this analysis of physical activity in the elderly reveal a trend that is always utilitarian, with the initial competitive motivation being followed by a utilitarian one. The group is always organized as a macrogroup, although dyads or microgroups sometimes appear within the group as a whole. As regards motor skills, locomotion skills are promoted first, followed by stability ones, after

which more locomotion is encouraged, leading to the combination of both skills. Alongside this chain of motor skills the physical capabilities developed by participants move from endurance to stretch work.

5. Discussion

The temporal patterns obtained show that the varied programs of physical activity of municipal entitlement promote physical activity in elderly people. There certainly appear continuous motor skills, several of them being very repetitive due to the logic of the physical activity programs. However, the diversity of tasks and material uses allows participants to use not only a diverse range of motor skills (Gallahue and Cleland-Donnelly, 2003; Castañer and Camerino, 2006) if not specific motor capabilities and motor roles and profiles. We have proved that OSMOS_in_context offers a suitable observational system to merge motor skills behaviors and motor profiles and roles in context and, in this study, specific for elderly people.

Acknowledgments

We gratefully acknowledge the support of:

- The Spanish government project *Observación de la interacción en deporte y actividad física: Avances técnicos y metodológicos en registros automatizados cualitativos-cuantitativos* (Secretaría de Estado de Investigación, Desarrollo e Innovación del Ministerio de Economía y Competitividad) during the period 2012-2015 [Grant DEP2012-32124].
- The Catalan government Project (GRID) (Grant 2009 SGR829).
- The Catalan government Project *Progames de motricitat perceptiva i expressiva en bordelines i gent gran* (Grant AGAUR_INEFCP-2012).

- **Figures**
-

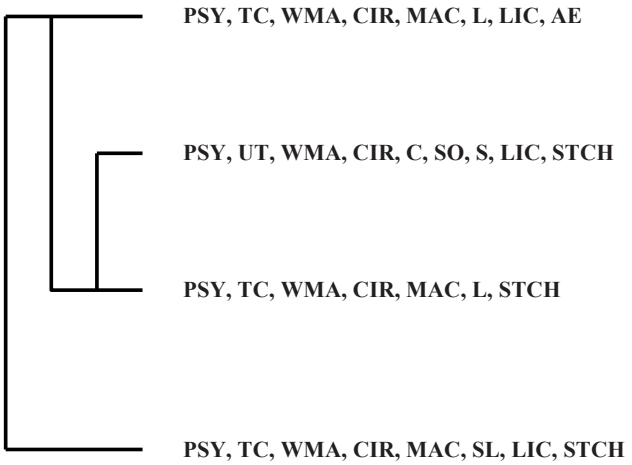

Figure 1. T-pattern of the motor skills behaviors and context that elderly performed while practice physical activity programs

Tables

Table 1. OSMOS_in_context: *System of Observation* in Context adapted *ad hoc* from OSMOS (Castañer et al., 2009).

CRITERIA	CATEGORIES/ CODE
Motor role	Phychomotor (PSY) Sociomotor (SOC) Combination of motor roles (CMR)
Motor profile	Utilitarian (U)
	Competitive (C)
	Recreational (R)
	Therapeutic (T)
	Utilitarian & competitive (UC)
	Utilitarian & Recreational (UR)
	Utilitarian & Therapeutic (UT)
	Recreational & competitive (RC)
	Therapeutic & competitive (TC)
	Recreational & Therapeutic (RT)
Material	Use material (MAT)
	Without material (WMA)
	Combined material (CM)
Spatial Organisation	Circle (CIR)
	Row (ROW)
	Other spatial configurations (OS)
Group Organization	Dyad (DY)
	Micro group (MIC)
	Macro group (MAC)
	Dispersion (DIS)

Interaction	Dyad interaction (DI)
	Group interaction (GI)
	Combination of interaction (CI)
Space	Change of spatial levels (CSL) Change of spatial direction (CSD)
Motor Skills	Stability (S) Locomotion (L) Manipulation (M) Stability & Manipulation (SM) Locomotion & Manipulation (LM) Stability & Locomotion (SL) Stability & Locomotion & Manipulation (SLM)
Perceptual Capabilities	Fine coordination (FIC) Limb coordination (LIC) Dynamic balance coordination (DBC)
Physical Capabilities	Aerobic endurance (AE) Reaction Speed (RS) Stretch (STCH) Strength (STRG)

References

Anguera, M T. (2003). Observational Methods (General). In R. Fernández-Ballesteros (Ed.), *Encyclopedia of Psychological Assessment*, Vol. 2 (pp. 632-637). London: Sage.

Castañer, M., Torrents, C., Anguera, M. T., Dinušová, M. & Jonsson. (2009): Identifying and analyzing motor skill responses in body movement and dance. *Behavior Research Methods 41* (3), *857-867*.

Castañer, M., Camerino, O., Anguera, Mª.T. & Jonsson, G.K. (2010). Observing the paraverbal communicative style of expert and novice PE teachers by means of SOCOP: a sequential análisis. Procedia - Social and Behavioral Sciences. *Innovation and Creativity in Education* 2(2), 5162–5167.

Castañer, M; Andueza, J; Sánchez-Algarra, P and Anguera, M. T. (2012): Extending the analysis of motor skills in relation to performance and laterality. In O. Camerino; M. Castañer and M.T. Anguera, (Ed.): *Mixed Methods Research in the Movement Sciences: Cases in Sport, Physical Education and Dance.* UK. Routledge.

Gabín, B., Camerino, O., Anguera, Mª.T. & Castañer, M. (2012). Lince: multiplatform sport analysis software. *Procedia - Social and Behavioral Sciences 46.* 4692 – 4694.

Gallahue, D., & Cleland-Donnelly, F. (2003). *Development of physical education for all children.* Illinois: Human Kinetics.

Magnusson, M. S. (2000). Discovering hidden time patterns in behavior: T-patterns and their detection. *Behavior Research Methods, Instruments, & Computers, 32*(1), 93-110.