

Attachment 1: Detailed definitions of each item of the protocol

1. *Task Features*

1.1 Dual Task: Execution of two or more tasks simultaneously, which divides the attentional resources during their execution. This item can be classified as:

- Present: This feature is required during the activity.
- Absent: This feature is not required during the activity.

1.2 Augmented Feedback: Information about the execution of a task added to the sensorial information and coming from an external provider to the subject. Augmented Feedback will be analyzed in terms of:

1.2.1 Type of feedback:

- Knowledge of Performance: information about movement/task parameters.
- Knowledge of Results: information about movement/task results.

1.2.2 Time of feedback:

- Concurrent: information is provided during the movement.
- Delayed: information is provided after a few seconds movement is finished.

1.3 Feedback processing and movement control:

- Online Control: When the task does not allow feedback use for adjustments during its execution. Motor adjustments occur during the execution.
- Offline Control: When the task allows feedback use for adjustments during its execution. Motor adjustments occur before the execution.

1.4 – Intention of movement

1.4 Stability tasks: emphasis in keeping balance during dynamic or static situations (one single leg, sitting, dodging, rolling This item can be classified as:

- Related to task goal: Essential for success in the task.
- Partially required: It is necessary in the task accomplishment, but it is not a main requirement for success.
- Not required: Does not interfere in task success.

Locomotive tasks: tasks aiming to take the individual from one place to another (i.e. walking, running, swimming):

- Related to task goal: Essential for success in the task.

- Partially required: It is necessary in the task accomplishment, but it is not a main requirement for success.
- Not required: Does not interfere in task success.

Manipulative tasks: applying force to an object or stopping an object movement (i.e. hitting, writing, knitting):

- Related to task goal: Essential for success in the task.
- Partially required: It is necessary in the task accomplishment, but it is not a main requirement for success.
- Not required: Does not interfere in task success.

2. *Environment features*

1.5 2.1- Ecological Validity: Level of similarity of a representation of the real world on a virtual environment to reality itself, including the task execution. This item can be classified as:

- High: Virtual environment and task are very similar to reality.
- Medium: Virtual environment and task are somewhat similar to reality.
- Low: Virtual environment and task are not similar to reality.

2.2- Avatar representation on virtual environment: representation of the subject on the virtual environment. This item can be classified as:

- First person;
- Third person.

2.3- Avatar appearance: how the avatar is represented in the virtual environment. This item can be classified as:

- Customized: Created by the subject from options offered by the system.
- Previously defined: Assigned automatically by the system.
- Player's representation: the subject is represented on the virtual environment on a similar way.

2.4- Environment stability: predictability of environment variations. This item can be classified as:

- Unstable environment: unpredictable environment, with changes happening.
- Stable environment: predictable environment, with few or no changes.

3.- *Biological features*

3.1 – *Motor features*

3.1.1- Multi-limb coordination - Capacity of coordinating multiple limbs simultaneously (i.e. juggling, playing the drums). This item can be classified as:

- Present: This feature is required during the activity.
- Absent: This feature is not required during the activity.

3.1.2- Bimanual coordination: Required for tasks in which the two upper limbs execute the same movements. This item can be classified as:

- Present: This feature is required during the activity.
- Absent: This feature is not required during the activity.

3.1.3- Bimanual asymmetry: Movements in which both upper limbs are required, but with spatial and temporal differences. This item can be classified as:

- Present: This feature is required during the activity.
- Absent: This feature is not required during the activity.

3.1.4- Muscle involvement: Which size/type of muscles are mainly required for the task. This item can be classified as:

- Gross motor skill: Use of major muscle groups in the task (i.e. running, jumping, throwing).
- Fine motor skill: Use of minor muscle groups, usually for a precision task (i.e. writing, typing, painting).

3.2 – *Conditional features*

3.2.1 – Flexibility: capacity of performing movements in a great range:

- Related to task goal: Essential for success in the task.
- Partially required: It is necessary in the task accomplishment, but it is not a main requirement for success.
- Not required: Does not interfere in task success.

3.2.2 – Muscle endurance: Capacity of an individual to keep applying force for a certain period time:

- Related to task goal: Essential for success in the task.

- Partially required: It is necessary in the task accomplishment, but it is not a main requirement for success.
- Not required: Does not interfere in task success.

3.2.3 – Cardiovascular endurance: Capacity to perform cyclical, continuous submaximal activities, being limited by oxygen supplying by cardiopulmonary system:

- Related to task goal: Essential for success in the task.
- Partially required: It is necessary in the task accomplishment, but it is not a main requirement for success.
- Not required: Does not interfere in task success.

3.2.4 – Speed frequency: Capacity of performing similar movements in high velocity with little resistance to overcome:

- Related to task goal: Essential for success in the task.
- Partially required: It is necessary in the task accomplishment, but it is not a main requirement for success.
- Not required: Does not interfere in task success.

3.2.5 – Agility – Capacity of changing global movements in a small amount of time:

- Related to task goal: Essential for success in the task.
- Partially required: It is necessary in the task accomplishment, but it is not a main requirement for success.
- Not required: Does not interfere in task success.

3.2.6.1 – Dynamic balance – Capacity of keeping balance in unstable conditions:

- Related to task goal: Essential for success in the task.
- Partially required: It is necessary in the task accomplishment, but it is not a main requirement for success.
- Not required: Does not interfere in task success.

3.2.6.2 – Static balance – Capacity of keeping balance in stable conditions:

- Related to task goal: Essential for success in the task.
- Partially required: It is necessary in the task accomplishment, but it is not a main requirement for success.
- Not required: Does not interfere in task success.

3.3 – *Perceptual and cognitive features.*

3.3.1 - Reaction time: Ability of quickly respond to a stimulus (considering one type of stimulus and one type of answer). This item can be classified as:

- Present: This feature is required during the activity.
- Absent: This feature is not required during the activity.

3.3.2 - Timing: Production of adjustments in continuous anticipatory or interception movements in order to respond to changes on a moving target (i.e. stepping into an escalator, entering a revolving door). This item can be classified as:

- Present: This feature is required during the activity.
- Absent: This feature is not required during the activity.

3.3.3 - Motor synchronization/rhythm – Ability to synchronize movements to an external rhythm source (i.e. following a choreography). This item can be classified as:

- Present: This feature is required during the activity.
- Absent: This feature is not required during the activity.