Spontaneous Physical Activity

This measure is an observation of Spontaneous Physical Activity of girls and boys, between 4 and 24 months of age. This is the complete professional manual that will be used to record events for the collection, management, analysis and presentation of observed information; this is an important tool for the study of the process of behavior when one needs a level of detail that you cannot obtain without an automated system; it is useful when one needs activities, postures, movements, positions and interactions; it is easy to apply and permits the recording of one or various activities at the same time. In this method, the investigator will observe one or more individuals in a certain place, and enters the observations of behavior in an electronic program using numeric codes; for example: for LIGHT movement the code is 1.

We are interested in measuring the spontaneous physical activity of the girl or boy that is divided into three parts of three behaviors which are described below:

1. Movement

We are interested in measuring different movements that the child completes, involving one or more parts of the body, and also the intensity of the movement; which we will classify in the following manner:

- **No Movement (sedentary):** the child does not realize any type of movement, he can be lying down, sitting, or standing; his body is at rest. This category can include when the child in manipulating a toy in his hands.

- **Light Movement:** This category includes those movements that the child realized that of little intensity, the child uses a low level off force or energy; the movements are light, soft, and incorporate the movement of the head or one extremity.
The following are examples of light movement:

- Moving in the same place without advancing
- Movements of the head in order to see an object or his mother
- Moving an arm or a leg softly in order to reach, signal or touch an object (i.e., to show it to the mother)
- Play with a toy softly, lightly or slowly

**Light/moderate movements**: This category includes all movements that the child realizes that are a mix of light and of moderate intensity movements, that is that the intensity and force needed to complete the movement are NOT light or soft but at the same time do NOT require a large amount of movement of the body, for example:

- Walking slowly, taking pauses
- Moving two extremities
- Turning movements (arms, trunk, head) to reach, touch or signal an object
- Pushing a toy with little intensity (pushing a car or other toy, moving a ball)

**Moderate movement**: These movements are more rapid and/or stronger, they require more energy and force; the child shows greater activity and body movement; includes the following examples:

- Walking
- Walking quickly with support (e.g., holding a rail)
- Pushing a toy with force (the child standing in the same place)
- Walking pushing a toy
- Throwing a ball with the hands
- Hitting a toy with force
• Walking and moving the arms
• Crawling quickly
• Crawling and pushing a toy
• Kicking a ball or throwing it far from where standing

• **Intense Movement (vigorous):** These movements involve activities that demand large bodily movements, need great force and energy on the part of the child. The following are examples:
  • Jump
  • Run
  • Dance with movement of the entire body
  • Move the head and arms simultaneously, intense movements even if for a short time

2. **Exploration**

With this measure we will emphasize the amount of attention that the child puts when he observes and/or touching a toy; there are five categories of exploration:

• **No Exploration:** the child does not observe or touch a toy.

• **Observing without touching:** looking intently at an object, with the purpose of understanding it, but not manipulating it. Looking closely at its parts, formation and colors.

• **Observing and touching:** looking intently at an object and touching its parts, texture, formation and color.

• **Touching without looking:** The child touches a toy with his hands but is not looking at it (tactile exploration); his eyes can be looking toward other objects or the mother.

3. **Locomotion**
In this part of the measurement, we are interested in measuring the distance that the child displaces himself during the time of observation; this measure is undertaken in a room of at least 3.99 X 3.99 meters with the space where the child can move during the observation being 3X3 meters. The floor is made of Foami (a soft foam light material) of 60cm X 60cm. Around the area is a rail made of PVC tubes (like a small corral) 75cm high. This rail can serve as support for the children that cannot yet walk. The rail is covered with “walls” of fabric which do not permit the child to leave the designated space. The mother will stay inside of the room (but outside of the space where the child is during the 15 minute observation) seated in a chair which will be next to the door to enter the corral.

A tripod 150cm high with a video camera that records directly to DVD will be used to record the behavior of the child during a period of 15 minutes. The recorded DVDs will be taken to the investigation center (INSP) for coding in the office. Because of the complexity of the measurement, a decision was made to enter the data in the following way:

- In the first viewing of the video, the observer will code the information for movement.
- In the second viewing of the video, the observer will code the information for exploration.
- In the final viewing of the video, the observer will code for locomotion.

And in this manner, we will complete the three parts of the measurement.

The toys selected were: a car, a toy shopping cart, two toys to push, a toy to pull and a ball. The intent was to promote movement, exploration and locomotion of the child; the toys were placed in all areas of the corral.

**Defining the crossing of squares for the measurement of locomotion:**

We are going to consider the following information:
Online Supporting Material

- In the program, the observer presses “spacebar” on the keyboard every time that the child crosses a square of foami.
- The child should completely cross the square for the movement to be noted.
- Do not mark a square crossed when the child only stops on the corner or some small part of the square.
- The child can enter two squares and in this case it is noted that he crosses one square.
- The child can cross a square in different ways. In some occasions he can begin to walk in the corner of a square and go to the middle and then cross over to another square; in some occasions the child can cross half of the square and half of another square and this is one complete square; in some occasions he can cross half of a square and then return to the same place, this is also the equivalent of crossing an entire square; mentally the observer is observing all of the small spaces that the child crosses and is adding them to complete squares.

Basic criteria for recording spontaneous physical activity in the field.

- Before the first day of recording, the fieldworker should prepare the observation area.
  1. Ensure that there is adequate space for the observation. There must be a space with free space of at least 3 m X 3 m. Ideally it is a space with a minimum amount of furniture and few decorations on the walls, floors or roof. If there is a window, it must be closed and the curtains closed or the window covered in some way to minimize distractions that activity outside of the observation room could cause the child.
  2. Put together the floor of foami, alternating the colors of the squares. There should never be two squares of the same color in a horizontal or vertical line. In order to have a floor of 3X3m, there must be 5 squares X 5 squares in the exterior of the floor. There should be 3 squares extra for use in case one of the original squares is damaged.
3. Put the corral together. The ends of the PVC tubing are distinguished with a letter starting with A then B, etc. The end with the letter A should join with the end of the next tube with the letter B. The tube with the letter B has at its other end the letter C which should be joined with the tube with the letter D. In every connection of tubing there is a tube connected vertically in order to support the corral. Following this pattern, one can put together the entire corral without difficulty. Once the corral is together, one should return to end vertical tube in order to close together the cloth connected to the tubing that forms the walls of the corral.

4. ALWAYS put the toys into the corral in exactly the same place (see the map)

5. Put a chair next to the corral for the mother which is outside the corral but inside the room. There should be a magazine for the mother to look at while the child plays. In this way the mother can be present with her child but NOT interacting with the child.

- Once the area is ready, the observer checks the camera before the observation and ensures that the battery has sufficient charge and that the camera is in a position to record the entire space of the corral. Ensure that the camera has a DVD in place in order to record. Before each session, write on a paper the identification of the child. Put this in front of the camera and record for several seconds. Additionally, the fieldworker needs to write the identification number of the child and the date on the DVD.

- Give instructions to the mother before entering the room, ensure that the mother understands very clearly that the child should play alone.

  “Señora, thank you for coming, we would like to observe your child playing alone with toys that are in this room; you are going to be seated in the chair, do not talk or play with your child, only if your child needs you; when we enter the room we are going to close the door and I want to place your child in the square that is next to the
door to enter the corral; during the observation it could happen that your child would like to leave the corral and cry, you can take him out of the corral after he cries for one minute and only for a moment and then you need to place him in the same place where he was when you picked him up; do not give him a bottle, juice or anything to eat during the time he is inside the corral. I am going to stay near the camera in order to ensure that it functions correctly. I am not going to interact with you or your child during the observation. While the observation is going on, you can look at a magazine.”

- Accompany the mother and child into the room and ask if she has any questions.
- Begin recording when the child is placed in the corral.
- After one minute, begin the stopwatch. The observation will be exactly 15 minutes. Be very careful that the observation does not finish early or does not continue past 15 minutes and 00 seconds.
- When the child is crying, we ask the mother to carry him for just a moment; then we ask that she put him back in the corral exactly where he was. Do not stop recording and do not stop the stopwatch.
- You should always take 15 minutes of observation on all children.
- When 15 minutes have passed, tell the mother that the evaluation is complete and she may pick up her child. Do not forget to tell her thank you for her participation and her time.
- Prepare the area for the next evaluation. Replace all the toys in their designated spots. Check the camera. Record the number of the next participant and the date of observation.

Placement of the toys

Mother
The DVDs should be saved and then transported to the coordinator of physical activity at the INSP in Cuernavaca. The DVDs should be organized by community. Each DVD should have the code of the community, the name of the community and the code and name of the fieldworker who recorded the session.

Criteria for evaluation:

In every community that the observer enters, he should evaluate the activity of the 20 children involved in the larger study. In order for the evaluations to be valid, the following criteria need to be met:

- The date of the observation should be at baseline of the study, at 4 and at 10 months after the initiation of supplementation.
- If something occurs and the observation is not completed at the same time as the evaluation of other variables in the study, the evaluation must be done during the week following.
- The observations should be planned in accordance with the schedule of the mother.
- The child should be in good health.
- Understand the routine of the child in order to know what time is best for him to be observed.
- The observation is always done individually
- The toys are always in the same place for every child.
- The room should be private and with adequate lighting and ventilation, free of noise and interruptions by other people.
- The walls should be painted a neutral color and without decoration.
Online Supporting Material

**Materials for the Evaluation**
- A camera that records to DVD.
- The portable corral.
- A 150cm tripod.
- The portable flooring made of foami.
- A chair and magazines for the mother.
- A stop watch.
- Six toys: a shopping cart, a car, a toy to pull, a ball, and two toys to push.

**Training phase**
Before beginning this phase, various videos of boys and girls of the age of interest of the study (4 – 24 months) were made; and afterwards the following activities were undertaken:
- Explanation by the coordinator of physical activity on the purpose, the description of the measurement and the way in which information will be collected.
- Individual instruction on the three types of behavior to be assessed: movement, exploration, locomotion.
- Practice observing the videos, each one of the observers noting on paper and then comparing the resulting and discussing the differences.
- There will be a number of meetings to discuss the advances made in the practice of the measurement and to make decision on any changes that might be necessary.
- Each observer practices individually how to make the observations and then transfer the information on the subjects onto the questionnaire.

**Observation of the videos in the office**
- The videos will be given to the coordinator of physical activity for the coding of behavior.
Online Supporting Material

• Before beginning the coding of the activity, the information of the participant will be filled into the questionnaire 09. The number of the community and the date of observation will be written by the worker in the field. The date of observing the videos will be recorded and then recorded as the data of coding.

• A coding computer program was developed by the INSP informatics team. The videos are viewed on the computer using this program so that coding and a time-stamp are used to quantify the amount of time in each coding category for the videos.

• In the first viewing of the video, the observer codes Movement. The first code is “Without movement” (number 1). When the child changes his movement, press the number on the key pad which corresponds to the coding category of the new movement. Each time the child changes his movement, press the number that corresponds to the new movement. The program will time-stamp each time a new number is pressed. The information is saved in an excel spreadsheet. Once the video is finished, the excel sheet should be saved and the total time in each movement category summed.

• In the second viewing of the video, the observer codes Exploration. The first code is “Without exploration” (number 1). The coder following the same instructions as with movement but codes exploration using the corresponding exploration numeric coding categories.

• In the third viewing of the video, the observer codes Locomotion. Locomotion is quantified according to the number of colored squares on the flooring that the child crosses. In the viewing program, the coder can merely press the spacebar each time the child cross completely a square. The number of times the spacebar is hit is saved in an excel spreadsheet and can be multiplied by the size of each square (.6m) to quantify distance traveled.

Notes
Online Supporting Material

- When the child participates in a conduct for 2 seconds or less, the coder does not need to change the coding category.

When the child carries an object in his hand and is looking at another object, this exploration in coded as “observes and touches” (number 2).