



Lab 5

Balance

Statement of the Problem

The purpose of this laboratory experiment is to examine the influence of three conditions on a single leg balance task: (1) eyes open vs. eyes closed, (2) shod vs. barefoot, and (3) Compliant vs. non-compliant surface.

Reference

Chapter 5

Materials Needed

- Stop watch
- Foam pad (could substitute a pillow or sofa cushion)
- Individual Data Sheet
- Group Data Sheet.

Procedure

You will take turns in the roles of experimenter and participant. Participants will perform 3 single leg balance trials on each leg with their arms crossed (hands touching opposite shoulders) with both their eyes open and eyes closed under the following conditions:

- a. shod on a non-compliant surface (floor);
- b. barefoot on a non-compliant surface (floor);
- c. shod on a compliant surface (Foam pad);
- d. barefoot on a non-compliant surface (Foam pad).

Participants will cross their arms over their chest before raising their leg. In accordance with the procedure outlined by Springer et al. (2007) experimenters will use the stopwatch to measure the amount of time participants are able to stand on one limb beginning when the foot is raised from the floor and ending when the participant either:

1. uses or uncrosses their arms;
2. touches the floor with the raised foot;
3. moves the weight bearing foot in order to maintain balance (e.g. rotate it on the ground);
4. a maximum of 45 seconds has elapsed;
5. opens his or her eyes during an eyes-closed trial.

Record the time on the [Individual Data Sheet](#) Upon completion of all trials the participant and experimenter will switch roles. NOTE: Experimenters should position themselves close to participants and be prepared to intervene should they begin to fall.

Results

1. Add the times of trials 1–3 in each condition then calculate the mean time for each participant by dividing the total by the number of trials (3).
2. Place each participant's data into the [Group Data Sheet](#).
3. Calculate the group means for each condition.
4. Draw a bar graph to represent the group means for each condition.

Discussion

1. Briefly describe and compare the group results for the following conditions:
 - a. eyes open vs. eyes closed;
 - b. shod vs. barefoot;
 - c. compliant vs. non-compliant surface.
2. Discuss your findings in relation to vision and proprioception.
3. Compare the group data to the normative values reported by Springer et al. (2007) for the single leg stance test conducted barefoot, on a non-compliant surface with eyes open and closed.

Age (Years)	Eyes Open (Sec)	Eyes Closed (Sec)
18–39	43.3	9.4
40–49	40.3	7.3
50–59	37	4.8
60–69	26.9	2.8

4. Discuss the importance of proprioceptive training for the following:
 - a. motor development in early childhood;
 - b. rehabilitation following an injury;
 - c. injury prevention in athletes;
 - d. falls risk in older populations.

Individual Data Sheet

Trial	Eyes Open				Eyes Closed			
	Shod Non- Complaint	Barefoot Non- Complaint	Shod Complaint	Barefoot Complaint	Shod Non- Complaint	Barefoot Non- Complaint	Shod Complaint	Barefoot Complaint
1								
2								
3								
MEAN	0	0	0	0	0	0	0	0

Group Data Sheet

Trial	Eyes Open				Eyes Closed			
	Shod Non- Complaint	Barefoot Non- Complaint	Shod Complaint	Barefoot Complaint	Shod Non- Complaint	Barefoot Non- Complaint	Shod Complaint	Barefoot Complaint
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								

... continued

Group Data Sheet ... continued

Trial	Eyes Open				Eyes Closed			
	Shod Non- Complaint	Barefoot Non- Complaint	Shod Complaint	Barefoot Complaint	Shod Non- Complaint	Barefoot Non- Complaint	Shod Complaint	Barefoot Complaint
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
MEAN	0	0	0	0	0	0	0	0