Evenwicht en reactie

v2023 04 06

Hierna bespreken we enkele vereenvoudigde testen om evenwicht en reactiesnelheid te testen. De testen zijn ook op wetenschappelijke en evalueerbare wijze uit te voeren door specialisten.
Ons doel is enkel om een idee te hebben of er bijzondere oplettendheid of maatregelen aanbevolen zijn, en dit meer bepaald voor de kajak sport.
Een typisch probleem is een golf die bij de kajak langs achter oploopt. De snelheid van dat oplopen schatten we op 12 km/uur ("snelheid golf" min "snelheid kajak ten opzichte van de golf")
We veronderstellen dat als de golf 1 m is ingelopen op de kajak de kajakker gereageerd moet hebben met achterwaartse steun. Door de achtersteven op te lichten verliest de kajak zijn secundaire stabiliteit die zich voornamelijk situeert rond de cockpit zone (breedste deel), en zal hij kantelen.
12 km/ uur = 12000 m / 3600 sec = 3,3 m /sec
1 m geeft dus een totaal van 300 ms om gepast te reageren.

Als we de peddel 1 m moeten verplaatsen in achterwaartse steun met een geschatte verplaatsing aan 100 km/uur (vergelijk speerwerpen of bal werpen,..) dan kost dat (100.000 m / 3600 sec) = 36 ms om de 100 cm af te leggen.
We schatten 150 ms om de onstabiliteit te detecteren en 36 ms om te reageren. Totaal 186 ms.

https://us.humankinetics.com/blogs/excerpt/measure-balance-and-stability

Evenwicht test:

THIS IS AN EXCERPT FROM NSCA'S GUIDE TO TESTS AND ASSESSMENTS BY NSCA -NATIONAL STRENGTH & CONDITIONING ASSOCIATION & TODD MILLER.

Measuring Balance and Stability

Fitness professionals should first establish the purpose of the test, pick a category that would fulfill that purpose, and then select a test based on the level of precision required and the resources available. Three tests, the balance error scoring system (BESS), the star excursion balance test (SEBT), and the modified Bass test, were selected for detailed discussion here because they represent different categories (postural steadiness, reach, and postural stability) and require minimal specialized equipment. Additionally, the BESS and SEBT have excellent reliability and a large body of literature supporting them. Interested readers should consult the original literature cited in the reference section for detailed procedures on conducting the other tests. Table 12.1 compares balance and stability evaluations.

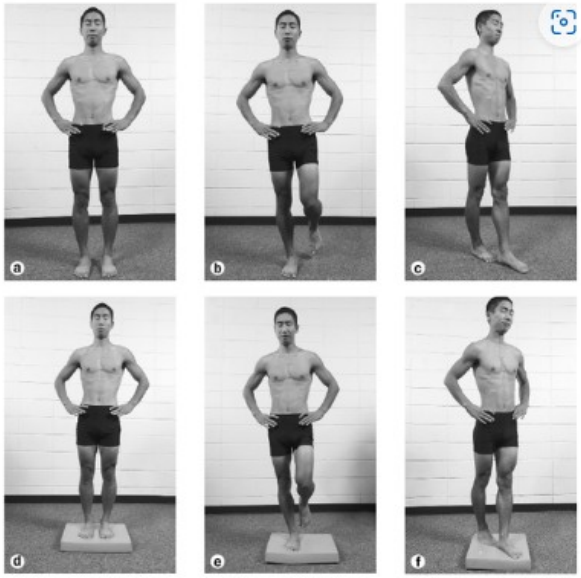


FIGURE 12.3 Balance error scoring system (BESS). Top row, firm surface condition. Bottom row, soft surface condition. Left column, parallel stance. Middle column, single-leg stance. Right column, tandem stance.

Voor de eenvoud behouden we uit deze test voorlopig enkel de eerste 3 posities (a, b en c).

Procedure

The six positions of the balance error scoring system test are depicted in figure 12.3. Three stances (double-leg support, single-leg support, and tandem) are held for 20 seconds on two surfaces (firm floor and foam pad) for six permutations (Riemann, Guskiewicz, and Shields 1999). During the tandem stance, the dominant foot is in front of the nondominant foot. During the single-leg stance, the subject stands on the nondominant foot. During the test, the eyes are closed and the hands are held on the hips (iliac crests).

Subjects are told to keep as steady as possible, and if they lose their balance, they are to try to regain the initial position as quickly as possible. Subjects are assessed one point for the following errors: lifting the hands off the iliac crests; opening the eyes; stepping, stumbling, or falling; remaining out of the test position for five seconds; moving the hip into more than 30° of hip flexion or abduction; or lifting the forefoot or heel (Riemann, Guskiewicz, and Shields 1999). A trial is considered incomplete if the subject cannot hold the position without error for at least five seconds. The maximal number of errors per condition is 10. An incomplete condition is given the maximal number of points (10). The numbers of errors for all six conditions are summed into a single score.

Bv: Elke stand wordt minimaal 5 sec behouden met een maximum van 20 sec. Ogen gesloten, voeten plat op de grond, handen in de zij. 10 pogingen per stand.

Reactietest:

https://www.bbc.co.uk/bitesize/guides/zpkhcj6/revision/3

Suggested practical - Investigating human reaction times
You can carry out a number of investigations to determine the effect of a specific factor on human reaction times. A suitable investigation could be the effect of caffeine or the amount of background noise in the room. A simple method to measure the effect is to use the ruler drop test.

Aim

The aim of this experiment is to determine whether a factor such as caffeine or background noise affects reaction times.

Ruler drop test

1. Work with a partner.
2. Person A holds out their hand with a gap between their thumb and first finger.
3. Person B holds the ruler with the zero at the top of person A's thumb.
4. Person B drops the ruler without telling Person A and they must catch it.
5. The number level with the top of person A's thumb is recorded in a suitable table. Repeat this five times.
6. Swap places, and record another five attempts.
7. You can use the conversion table to help convert your ruler measurements into reaction time or just record the catch distance in centimetres.

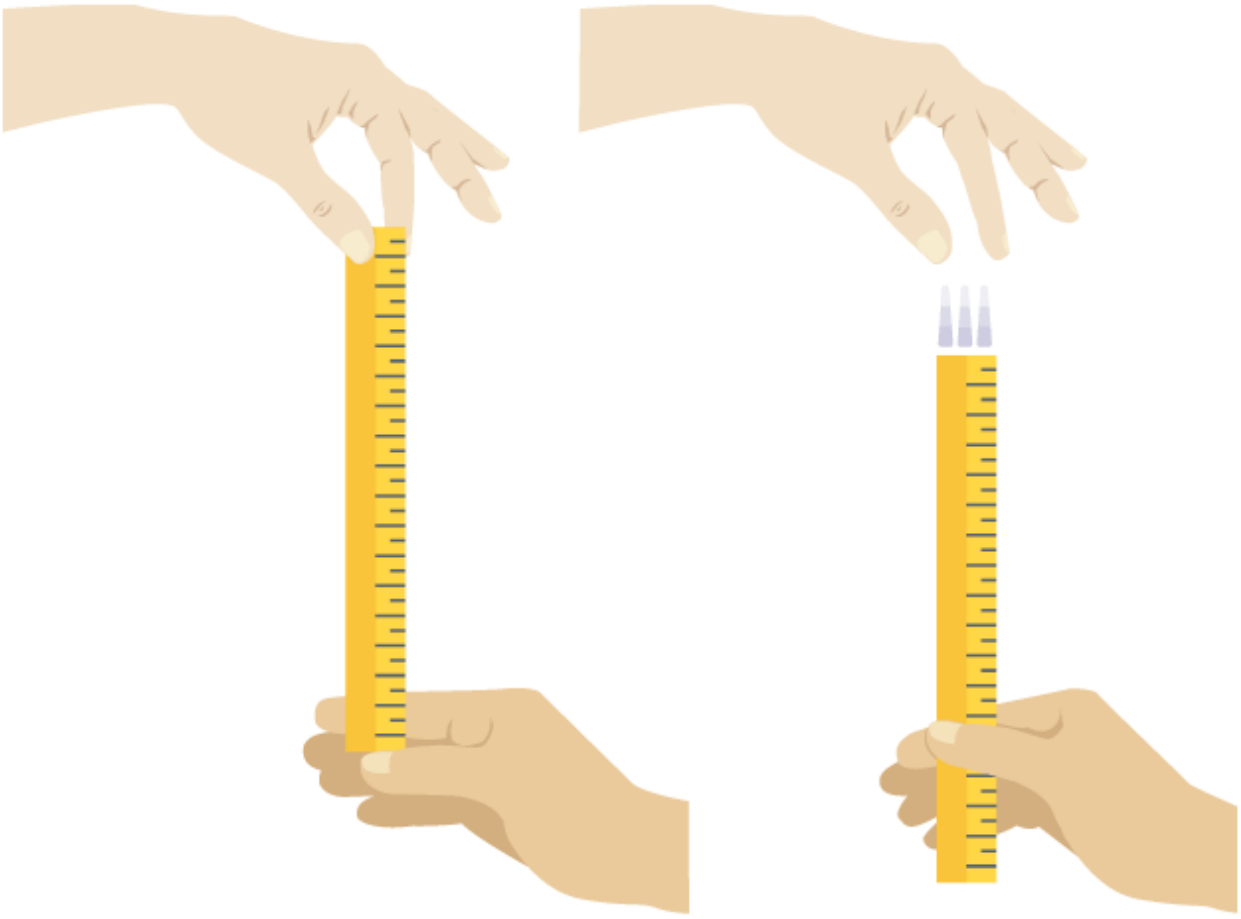
The process of catching a ruler to test reaction speeds

Catch distance (cm)	Reaction time (ms)
1	50
5	90
10	140
15	170
20	200
25	230
30	250

One millisecond is one thousandth of a second. It can also be written as 10^{-3} s.

Example results

Attempt number	Distance on ruler (cm) With noise	Distance on ruler (cm) Without noise
1	25	18
2	38	15
3	36	22
4	31	24
5	38	13
Average	33.6	18.4



The process of catching a ruler to test reaction speeds

Bv: eerste testen 07 04 2023

– Mijn persoonlijk resultaat bij de drop test is 13 cm (herhaaldelijk) = ong 150 ms

– De evenwichtoefening b lukt niet c op de limiet.