

- If the score of use of the foot is greater than or equal to 17: he is a strong left-footed.
- The second test is a test of podal preference. It is a speed running in a straight line along 8 meters, then turn on to the right of the picket or to its left depending on the choice of the subject at a distance of 4 meters, which is limited by a picket and we recorded the chosen direction to achieve this turn.
- The third test is a performance test. This is the same procedure as above, but we must call from the outset about the direction of deviation by measuring the elapsed time with a stop-watch.

3. Results

3.1 Podal Preference

For all items, the frequency of homogeneous footed is 8.3%, of right-footed, 70 % of mixed right footed, 21, 67 % of mixed left footed and no left-footed were observed (Table 1).

Table 1: Frequency of right-footed, mixed and left foot footed depending on the items.

	Right footed	Mixed right footed	Mixed left footed	Left footed
Number	5	42	13	0
%	8.33	70	21.67	0

3.2 Preference of Deviation

The majority of subjects prefer turning to the right. The frequencies of deviation to right and to the left are 70% and 30% respectively (Table 2).

Table 2: Frequency of preference deviation to the right and to the left.

	Right deviation	Left deviation
Number	42	18
%	70	30

Our results showed an effect of degree of the foot preference on direction of deviation ($\chi^2(2) = 5.95, p < .05$). This effect indicates that right footed subjects have the higher frequency to deviate to the right (Fig 1).

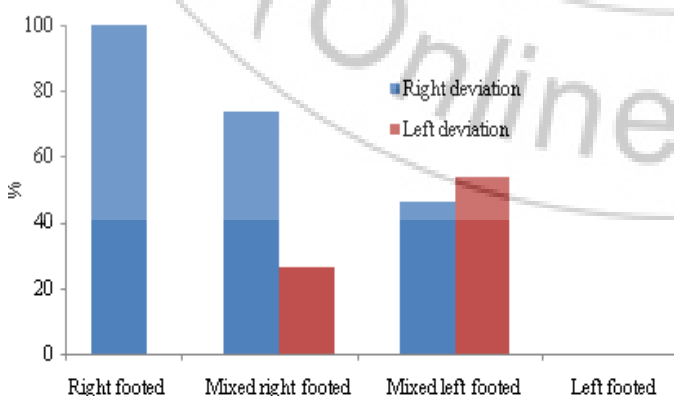


Figure 1: Frequency of right-footed, mixed right-footed, mixed left footed and left footed as a function of direction of deviation.

We didn't found an effect of group (trained vs untrained) on the preference of deviation. The frequencies to deviate to the right are similar for the two groups (67.9 % for trained group and 71.9 % for untrained group).

3.3 Performance of Deviation

A MANOVA for group as independent variable and for direction of deviation as repeated factors showed a significant group effect, $F(1,58) = 141.26, p < .0001$, and a significant direction effect $F(1,58) = 5, p < .05$ and a significant group \times direction interaction, $F(1,58) = 9.85, p < .01$.

The group effect indicates a better performance for trained group (3, 24 sec) compared to the untrained group (5 sec), shown in Fig 2.

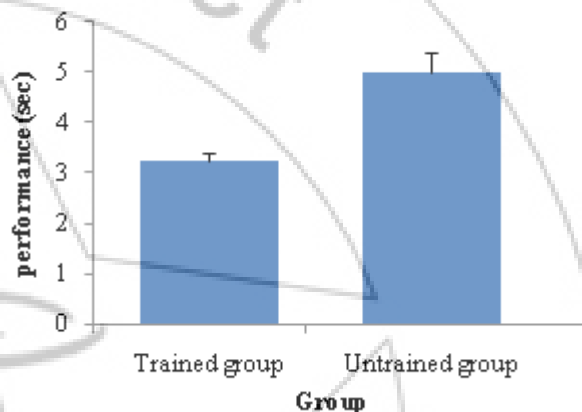


Figure 2: Performance of deviation as a function of group.

The direction effect indicates a better performance when deviating to the right (4.07 sec) than when deviating to the left (4.18 sec), shown in Fig 3.

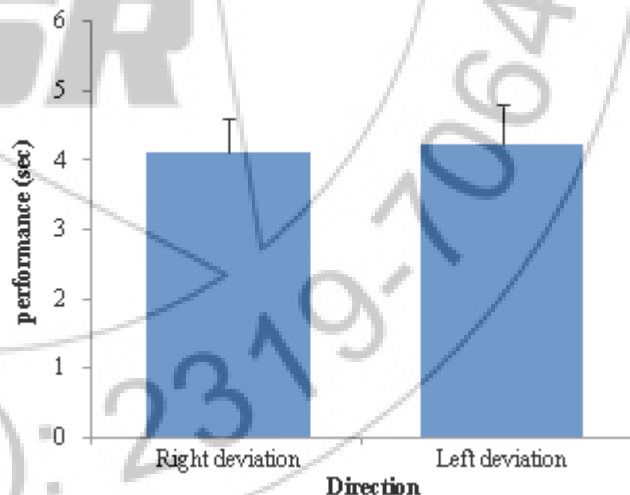


Figure 3: Performance of deviation as a function of direction.

The interaction group \times direction shows a large difference between performances of right deviation and left deviation among the untrained group but not among the trained group (Fig 4).

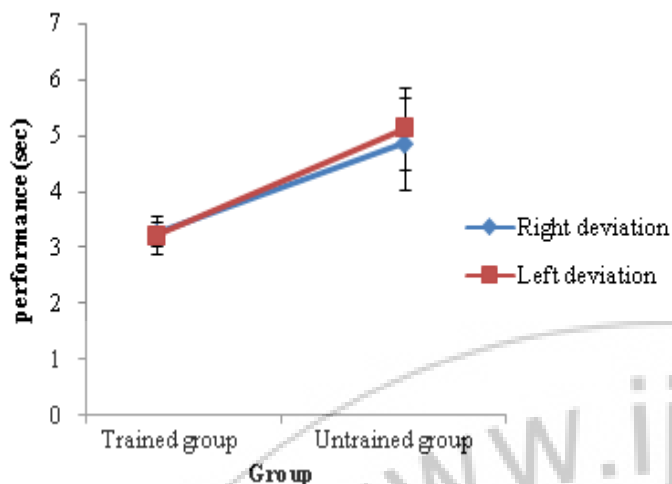


Figure 4: Performance of deviation as a function of direction and group

Our results don't show an effect of the degree of foot preference on the performance of deviation.

4. Discussion

The human foot exhibits a wide range of structural variations than many other parts of the body. The normal distribution of limb dominance among humans is approximately 80-90% are right-handed, 60-80% are right footed, and 80% of participants have a dominant hand and foot on the same side (Barut et al., 2007). However the notion of foot or leg dominance may not be as obvious and it might require to be viewed in a different perspective considering the roles of the legs in different tasks such as mobility and stability. A leg can be used to manipulate an object such as a soccer ball whereas the other foot has an important role of postural control and stability (Velotta et al., 2011). Our study takes place in this scientific junction by trying to assess foot preference and performance of deviation during a short sprint task among two groups (trained group and untrained one).

Our statistical data showed that the majority of subjects were mixed right-footed with 70 % vs mixed left footed ones (21, 67 %) and only 8, 3 % who were homogeneous right-footed. But it doesn't show any left footed subjects. This right podal preference is also reinforced by a preference of deviation with a majority of subjects prefer to deviate to the right (70 % vs 30 % to the left). Much more, our results showed an effect of degree of foot preference on the direction of deviation which indicates that right footed subjects have the higher frequencies to deviate to the right (counter clockwise). This found is consistent with some authors who have observed an influence of cultural factors on the asymmetries of directional trend (Fagard & Dahmen, 2003, 2004; Nunome et al., 2006; Zverev et al., 2007). Although, several authors showed a preference to deviate in the opposite direction of the needle clockwise (Toussaint & Fagard, 2008; Mohr, 2003).

Despite we didn't find an effect of group (trained vs untrained) on the preference of deviation. The frequencies to deviate to the right are similar for the two groups (67.9 % for trained group and 71.9 % for untrained group). Our result

are conform to the studies of Kooij et al. (2007) and Carey et al. (2009) among professional soccer, that skill cannot explain asymmetry of choice. This similarity about the preference of deviation between trained and untrained groups is also shown between amateurs compared to the general population (Carey, et al. 2009). Although, some other authors suggested that training and practice play roles in the development of both hand choice and hand skill (Teixiera, 2003; Ehrman & Perelle, 2004; Papadatou-Pastou et al., 2008; Medland et al., 2009; Suzuki, & Ando., 2014).

Concerning the performance of deviation, our results showed a better scores for trained group (3, 24 sec) compared to the untrained group (5 sec) which conform to results found by several studies which noted that training develop the performance of deviation (Carey et al. 2009; Greenwood et al., 2007; Hebbal et al., 2006). Furthermore, the direction effect indicates better performances when deviating to the right (4.07 sec) than when deviating to the left (4.18 sec). The interaction group \times direction shows a large difference between performances of right deviation and left deviation among the untrained group but not among the trained group. The absence of difference between performances in the two directions (right vs left), is may be due to the effect of sport practice.

But our results don't show an effect of the degree of foot preference on the performance of deviation which is consistent with the study of Carpes et al. (2010) who noted that symmetry can be improved with increasing running speed. However, asymmetries were suggested to be related to lower levels of performance (Nunome et al., 2006; Sanderson et al., 2000; Rahnama et al., 2005; Carpes et al., 2007; Valdez et al., 2004; Williams et al., 2001).

5. Conclusion

Our results on the preference of deviation indicate a preference to deviate to the right in both groups (trained and untrained). This found reflect the importance of biological factors to explain asymmetries. However we highlighted the influence of sport on the performance of deviation. The positive effect of sport on the performance of deviation can affect the non-preferred side. These results partly reinforce the role of environmental factors. It will be particularly interesting to study the preference and performance of deviation among left- footed population.

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