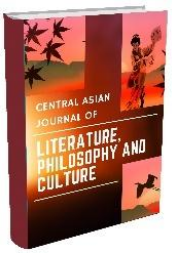

CENTRAL ASIAN JOURNAL OF LITERATURE, PHILOSOPHY AND CULTURE

eISSN: 2660-6828 | Volume: 03 Issue: 08 Aug 2022
https://cajlpc.centralasianstudies.org

A Study on Men's and Women's Surface Preferences from the Same Country

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Received 19th Jun 2022, Accepted 15th Jul 2022, Online 30th Aug 2022

There are some pretty noticeable differences. Canada and Portugal, for example, rate as solid hard-court countries on the men's side but mild clay-court countries on the women's side. And it's not like there are single players like Milos Raonic skewing the average; players like VasekPospisil, Frank Dancevic, and Erik Chvojka have Raonic's same surface numbers. And there isn't a single Canadian men's player that has a significant clay preference. The Canadian women, however, have a more mixed draw of surface preferences. For every hardcourt specialist like Stephanie Dubois, there's another clay-court specialist like Sharon Fichman. The distribution between hard and clay preferences skews about even. This brings up the million dollar question that's bugging me: Should the men's and women's surface maps converge to the same over time? Your answer roughly reflects two equally plausible views. If you say yes, that says surface preference is mostly determined by your home country's common courts and any differences are transient and due to small sample size. This is supported by a reasonable number of countries that are colored the same on the men's and women's maps. If you say no, that says you can have meaningful differences between men's and women's surface preferences from the same country. The most fitting explanation would be some sort of selection bias with regards to what kinds of players are more likely to succeed at an early age. Consider Canada again and a little bit of a stereotypical example. If you're a potential young male Canadian clay-courter, you're probably also playing youth hockey, because Canada. Maybe clay-court athletic builds translate into success in hockey more than hard-court builds, and the potential clay-courters go off and play in developmental hockey leagues because the rewards of hockey are much greater. The potential women's clay courters and hard-courters are probably also playing youth hockey, but when choosing paths to becoming a professional athlete, professional tennis offers a more lucrative payout than professional women's hockey. Tennis would then have a little bigger of a draw for high-level female athletes in Canada at an earlier age, resulting in a more even mix of clay and hard-court players. It's not clear whether meaningful surface differences by country can or should persist (or to make it even more ambiguous, whether a mix of both can be true). The ideas of selection bias and to what degree other sports compete for tennis' potential talent pool is an interesting question in itself. And on the women's side, tennis is not only competing with other sports' potential talent pools in each country, but probably also how encouraged women are to pursue professional athletic aspirations in general. I think John Inverdale's comments at Wimbledon made it pretty clear that it's still sadly a factor in 2013. And if meaningful differences do in fact exist, what kind of countries are more likely to have those differences and why. Anthropology majors, leave your theories in the comments. Rugby union is a tough sport. Historically, environmental factors such as weather and ground conditions have been cited as potential risk factors for injuries, including the hardness of the ground, which is generally believed to be a major contributor to injury.

Researchers in New Zealand recently examined the contribution of ground hardness, rainfall and evapotranspiration (water evaporation from soil and plants as a function of radiation, wind speed, temperature and humidity) to the incidence of injury, as well as looking at seasonal injury bias throughout a full season of rugby union (Association of ground hardness with injuries in rugby union. British Journal of Sports Medicine 2007: 41 582-587). Two hundred and seventy-one players from rugby union teams playing premier-grade rugby in New Zealand took part in the study. Ground hardness was measured and local weather information collected before each match over 20 rounds. The overall injury incidence during the season was 52 injuries per 1,000 match player hours. Ground hardness decreased throughout the season (rapidly at first, then levelling out). Injury incidence decreased by 2% with each successive round played. Overall, the researchers found seasonal changes in ground hardness and a tendency for injuries to occur early on in the season. These findings suggest that ground hardness could be a contributing factor to increased injury risk. It would appear that the extent to which ground hardness contributed to injury was more linked to the time of the season than specific environmental factors such as rainfall. However, the researchers did point out that a number of other confounding variables might have affected the reported pattern of injury incidence, such as: - attrition of an injury-prone group early in the season - more enthusiastic play arising from greater motivation in the early season - a reluctance to report injuries late in the season - poor physical fitness. This is the first study to measure quantitatively ground hardness in rugby union. Although hardness is a potential direct risk for injury, it may also be an indirect factor, producing increased traction, acceleration and ultimately, greater collision forces.

Tennis feet of clay?

When we think of tennis injuries we tend immediately to think upper limb. But most epidemiological studies of tennis have shown lower-limb injuries to be as prevalent or even more common than upper-limb injuries. Studies among elite players have shown that nearly 50% of all injuries are lower limb; an incidence almost twice that for the upper limbs and trunk/back. This should not really be surprising, given the repetition and intensity of acceleration and deceleration, changes in direction, running and side-to-side shuffling that are involved in tennis. Tennis performance is influenced by different playing surfaces. You need only consider the four Grand Slam tournaments, which are played on a variety of surfaces – hard courts (Australian Open, US Open), clay (Roland Garros) and grass (Wimbledon) – to understand why they regularly feature different finalists. It has been suggested that the different surfaces may also influence the incidence of injuries. Researchers from France and Qatar (Effects of the playing surface on plantar pressures and potential injuries in tennis. British Journal of Sports Medicine published online 12 June 2007; doi:10.1136/bjsm.2007.036707) investigated in-shoe landing patterns during two common tennis movements – serve and volley play, and baseline play – performed on two playing surfaces: clay and an artificial surface, 'Greenset'. Ten tennis players with an International Tennis Number of three or better participated in the study. Each subject randomly performed two different tennis movements on clay and Greenset. Insole plantar pressure distribution was recorded throughout each movement. The results showed that the playing surface significantly affected the players' plantar loading. On clay, the mean force was less than on Greenset, whereas contact time was longer. The Greenset surface also resulted in higher loading on the toes than clay. In contrast, the relative loads on the medial and lateral midfoot were higher in clay. The difference in loading patterns is important for understanding potential injury mechanisms and designing appropriate preventive strategies. Greenset: the higher friction enhances players' acceleration, speed and torque, hyperextension and the potential for muscle fatigue. Blocking-type injuries (ankle or knee strains, Achilles or patellar tendinopathy, knee ligament sprains)

are likely to occur on hard surfaces. Clay: Lower friction leads to longer sliding movements (longer contact times) which can result in a higher incidence of muscle strains/spasms.

As soft as grass

Artificial turf is becoming an increasingly popular playing surface for a variety of sports. The first generation of synthetic turfs appeared in the mid seventies. They had short, thin fibres and high levels of stiffness and friction. Since then technology has moved on. The new generation of turf has longer fibres (50- 60mm) and the surfaces are filled with siliceous sand and rubber granules to mimic more closely the playing characteristic of natural grass pitches. But how do they compare to natural turf when it comes to injury incidence? The majority of research has been conducted on the older firstand second-generation turfs. The most recent European study (the only one of its kind) has shown that the risk of injury among male professional players on this new type of surface is similar to that when playing on natural grass. Spurred on by this research, scientists based in Norway decided to investigate the risk of injury on artificial turf compared with natural grass among young female football players (Risk of injury on artificial turf and natural grass in young female football players. British Journal of Sports Medicine 2007: 41 33- 37). Two thousand and twenty players from 109 teams took part in the first study of its kind. The researchers assigned 18 physiotherapists to the teams to record injuries throughout the season. They found that, during the eight-month testing period, there was no overall difference in the risk of acute injuries between artificial turf and natural grass. Four hundred and twenty one players (21%) sustained 526 injuries, leading to an injury incidence of 3.7 per 1,000 playing hours. The incidence of acute injuries on artificial turf and grass did not differ significantly, although it was noted that there was a trend towards more ankle sprains on artificial turf than grass. It would seem that modern advances in turf technology have gone a long way towards preventing the knee and ankle injuries that seemed to be a regular occurrence on earlier turfs. This is good news, considering the practical advantages that artificial turf has to offer.

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