

Background

Why we are Built for Running:

Cost of Transport (COT) and the Energetic Paradox

Metabolic Cost of Transport = “oxygen consumption per unit body mass per distance” (Carrier 1984)

Humans **have no optimal running speed for COT**, unlike other running mammals - COT remains constant despite distance (Bramble & Lieberman 2004; Kram & Taylor 1990)

Endurance running much more sustainable for humans, larger oxygen availability (Kram & Taylor 1990)

Anatomy of Endurance Running in Humans

Energetics: features that allow us to maintain COT regardless of speed + spring-like tendons in legs, plantar arch function in foot, longer stride length (Bramble & Lieberman 2004; Kram & Taylor 1990)

Strength: specifically the skeletal system + dissipation of impact – enlargement of lower limb surfaces (Bramble & Lieberman 2004)

Stabilization: related to trunk and head (Bramble & Lieberman 2004) + more stable trunk, oppositional running movement, nuchal ligament

Thermoregulation: maintaining a regular and stable temperature (Bramble & Lieberman 2004) + reduced body hair, increased sweat glands, mouth breathing over panting

The Human Foot: designed to prevent torques, provision of haptic feedback, maintain correct posture/running position of legs and trunk (Morio et al. 2009)

Health Benefits to ER

Reduction/Prevention of sedentary lifestyle diseases (Cregan-Reid 2018), stress reduction

Why we do not Run:

Racism and Classism in Endurance Running

- ER largely practiced amongst the upper middle class (Stulberg 2017)
- Average cost of running a marathon = \$1600 (Stulberg 2017)
- Lack of time for those working multiple jobs
- Largely white sport
- Lack of African American participation in ER due to:
 - + lack of role models
 - + lack of safe places to run (i.e. gang violence in lower SES areas, police brutality, Ahmaud Arbery case)
 - + no “serious outreach to underrepresented ethnic and racial groups” by ER groups and organizations (Jennings 2011)
 - + Chemicals used in black hairstyles often break down under sweat – systemic racism (Jennings 2011)

Popular Misconceptions

Practicing ER incorrectly – too much of a focus on pace and speed (supported by COT)

Prevention of illness gained from ER but not from anaerobic exercises (Cregan-Reid 2018)

Incompatibility of Modern Gear with Natural Running Anatomy

Highly supportive shoes- prevent haptic feedback from feet (McDougall 2007; Morio 2009; Worrall 2017)

Too much support = shin splints, sprained ankles, etc.

Why aren't we all ultramarathoners? : Tying evolutionary data to modern cultural and social practices about endurance running

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Abstract

Endurance Running (ER) is a practice shrouded in myth and misconception. Previous research has shown that the anatomy of the foot, breathing ratio, and skeletal system of humans all lend themselves to endurance running. This study aims to identify the reasons that most humans do not practice endurance running, despite their proven evolutionary running abilities. A critical literature review was conducted, along with a survey which was distributed to both runners and non-runners to investigate their beliefs and conceptions regarding distance running. The results of the literature review and survey showed that discrimination and lack of access due to class and race, the incompatibility of modern running gear with natural running anatomy, and strong misconceptions about the sport were the main factors in preventing people from practicing it. Building off this research, a concerted effort should be made to create more inclusive running communities, change running shoe designs to enhance the foot's natural haptic feedback. and discredit popular myths regarding endurance running.

Methodology

Survey

- Created using Survey Monkey
- 19 questions long
- Goal = to assess runners and non-runners attitudes towards endurance running
- Posted to personal Instagram and remained open for two days
- Mixture of multiple-choice and open-ended questions

Limitations

- Convenience sampling rather than random sampling for survey – lacks generalizability to larger populations
- Interconnectedness of researchers utilized for literature review

Survey Results

Demographics

- N=59
- 96.61% white
- 81.36% female
- 40.68% 21-22 years of age
- 50.85% non-runners

General Trends for Participants that Run

- Runners chose neutral stability shoes more frequently (54.84%) than any other kind.
- Favorite Aspects of Running: getting exercise (37.50%) and being outside (40.63%)
- Least Favorite Aspect of Running: Pain (65.63%)
- Favorite Race Distances: 1 mile (21.88%) and 5k (37.50%)
- Least Favorite Race Distances: 100 m (27.27%) and 800 m (24.24%)
- Majority identified as recreational runners (81.82%)
- Typical Run Distance = 4-5 miles (84.84%)

General Trends for Participants that Do not Run

- Not enjoying running, lacking time, lack of inclusivity in the sport, too injury causing, “just not a runner”
- If they had to run, would run distance rather than sprinting (76.74%).
- Other Preferred Workouts: walking (31.91%), lifting weights (21.23%), and biking (10.64%)

Conclusion

Future Directions

1. Diversification/outreach to minorities by ER groups
2. More education surrounding the most beneficial ways to practice ER
3. Focus on shoe development that upholds rather than masks natural running anatomy (Morio et al. 2009)
4. Replication of study with a larger and more diverse/representative sample

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