The Footwear Gap in Marching Performance Artists: The Need for Research

Marching performers spend a significant amount of time on their feet practicing precise movements. Presumably, individuals choose footwear to practice in that is comfortable and suits their individual needs. However, when it comes to competition, there are a limited number of footwear options available, and they are not specialized to the individual. The purpose of this letter is to advocate for more research and the continued evolution of competitive footwear design for marching arts. *Med Probl Perform Art* 2025;40(3):94–95.

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TO THE EDITOR—Elite performers from competitive drum and bugle corps, as well as the country's top marching bands, often spend 8 to 12 hours/day on their feet during peak season. Like athletes in field sports, they require footwear that supports both training and competition. Yet, most ensembles lack footwear to meet the biomechanical demands of marching that accounts for varied surfaces and individual anatomical differences. Currently, collegiate and competitive bands practice wearing personal shoes that complement the individual's foot size, structure and preference. However, they are required to compete in uniform, mass-produced footwear. This shift disrupts learned motor patterns that can affect performance consistency but can also lead to higher injury risk. This letter serves to not only comment on the biomechanical disadvantages of these choices, but to identify the limited options available to ensembles and how that might be limiting the evolution of shoe design and protection against injury.

Demands of Marching Performers

Marching performers travel in forward, backward, or lateral directions, requiring unique gait adaptations distinct from typical walking or running. Two common techniques: the high step and roll step differ significantly. The high step, favored by traditional showbands, emphasizes hip flexion and abdominal control, with softer knee flexion during ground contact. Alternatively, the roll step involves an extended knee and dorsiflexed ankle at heel strike, similar to running's heel strike, increasing eccentric loading on the anterior lower leg, particularly the tibialis anterior (1). Although the roll step offers smoother visual flow and less vertical displacement, it combines repetitive load bearing with extended time on the field, potentially leading to fatigue and injuries like chronic exertional compartment syndrome (2). Backwards marching demands constant postural control, heel elevation (plantarflexion), and accurate proprioception, especially at fast tempos where performers cannot visually confirm foot placement. Lateral motion, commonly called crab stepping, is predominantly used by drumlines. The performer crosses one foot slightly over the other while keeping toes forward and aiming for flat foot contact to maintain balance and reduce ankle strain.

Shoe Designs for Marching Artists

Performance shoes should be designed to meet the biomechanical needs of these nuanced movement patterns. However, the currently available designs offer either a very inflexible sole or an narrow footbed with little to no lateral support. A wider toe box and reduced forefoot cushioning may enhance control during backwards movement. Reinforced lateral support can assist during crab stepping, while appropriate heel cushioning contributes to both shock absorption and postural symmetry (3). Despite the high physical demands and evolving athleticism in marching, shoe design has not evolved to meet these specialized biomechanical needs. Performance shoe options are limited in terms of innovation and evidence-based design, with only a few specialty footwear manufacturers that comprise the market (DSI-Director's Showcase International, Drillmaster, StylePLUS; Table 1). The outcome is that these manufacturers create shoes that try to address the visual and functional aspects of marching technique, with the biomechanical integrity of such designs lacking.

What is known of current performance marching shoes is that the majority are deficient in providing adequate support, cushioning, and flexibility on various surfaces of the field and the quality and performance of the shoes will favor appearance conformity and cost at the expense of ergonomics and injury prevention. This implies that performers are left to adapt their natural movement and gait patterns to accommodate the limitations of the shoe, rather than the shoe enabling the individual's optimized movement. Circumstantial and anecdotal evidence suggests these adaptations may increase the risk of joint wear, overuse injuries, and postural compensation over time. Additionally, there is a gap in research that evaluates the biomechanical impact of marching shoes on performer movement and very few studies have examined how current shoe designs affect gait, force distribution, or muscle activation during marching. This is particularly evident when considering the lower limb stresses are exacerbated by carrying an external load such as an instrument.

TABLE 1. Comparison of Current Popular Marching Shoes and Specifications/Design Elements/Cost

Shoe Model	Manufacturer	Key Features	Price (US$)
Super Drillmasters	Drillmasters	Patented Rolled-Heel™ for improved marching technique. Forefoot Hinge™ for enhanced flexibility.	$42.95
Velocity	DSI (Director's Showcase Inc)	Low-profile design resembling jazz shoes, slimmer toe box with additional padding. Lightweight construction suitable for dance-intensive performances.	$35.25
Renegade	DSI (Director's Showcase Inc)	Athletic design combining style and functionality. Low-profile with unmatched breathability.	$59.99
Crossover	DSI (Director's Showcase Inc)	Developed with input from a world-class podiatrist. Xtreme Tendon Fit® for midfoot support. Stabil® heel cup for added stability.	$54.95
Speedsters	Drillmasters	Budget-friendly option with solid molded sole. Padded ankle collar for comfort. Full-shoe lining for moisture control.	$29.95
Vanguard	Dinkles	Full leather uppers with non-slip heel keeper. Foam padded collar and runners ortho cup. Shock-resistant Triad® heel. Stabilizer skid-resistant thermal rubber sole.	$40.95

Need for Research on Shoe Designs for Marching Artists

From a business standpoint, the limited competition among manufacturers may reduce the incentive to innovate. Marching bands and drum corps often purchase footwear in bulk, and cost-efficiency tends to take precedence over performance or biomechanical optimization. The current shoe manufacturers service over 20,000 high school bands nationwide (4), with each band having anywhere from 60 to 200+ members. There is no market pressure to reevaluate design priorities and to perform the additional scientific studies needed for a biomechanically efficient and injury preventative shoe. Ideally, these shoes would complement the precise technique used in rehearsal, allowing for minimal adjustments to be made to this technique during performance.

Conclusion

The purpose of this letter is to advocate for additional research into marching band shoe design to optimize performance but also limit injury risk in an activity that has several hundred thousand participants in the United States, alone. The limited number of specialty shoe manufacturers in this space has likely contributed to the lack of research and innovation on the shoes. The limited number of movements used in marching technique should make them easy to study and evaluate, but trained biomechanists and clinicians need to realize the demand for work in this area. This work needs to be distributed to universities around the United States and globally that have marching bands and capabilities of doing the biomechanics research. Furthermore, our hope is that this market need reaches larger shoe manufacturers (Nike, Adidas, New Balance, Asics, etc.) that have the infrastructure and distribution to carry the products from research and innovation all the way to the consumer.

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