

JoCarol E. Shields, PhD

Curriculum Vitae

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EDUCATION	Oklahoma State University Ph.D. Health and Human Performance	Stillwater, OK May 2023
	Oklahoma State University Graduate Certificate Research, Evaluation, Measurement, and Statistics	Stillwater, OK December 2022
	Texas Tech University M.S. Exercise Science	Lubbock, TX May 2013
	Delaware State University B.S. Movement Science	Dover, DE August 2010

POSITIONS	Syracuse University <i>Postdoctoral Research Assistant</i> Neural Health Research Lab	Syracuse, NY Current
	Stetson University <i>Assistant Professor</i> HLSC 201 Anatomy & Physiology I HLSC 201 Anatomy & Physiology Lab HLSC 119V Health and Wellness	DeLand, FL 2023-2024 2023-2024 2023-2024
	Oklahoma State University <i>Graduate Teaching Assistant</i> HHP 4480 Internship in HHP HHP 3223 Motor Learning HHP 3333 Ethics in Sports and Coaching HHP 3443 Psychosocial Aspects of Sports and Coaching HHP 2802 Medical Terminology HHP 4733 Org, Admin, and Curriculum in PE & Ath.	Stillwater, OK 2022; 2023 2020-2022 2021 2020 2020; 2022-2023 2019
	Eastern Florida State College <i>Adjunct Instructor</i> HSCC 1000 Introduction to Healthcare HLP 2400 First Aid & Safety HLP 1081 Health Improvement & Assessment	Titusville, FL 2017-2019 2016-2019 2015-2016
	Texas Tech University <i>Graduate Teaching Assistant</i> PFW 1112 Diet & Exercise PFW 1130 Basketball	Lubbock, TX 2012-2013 2012

GUEST LECTURER

Oklahoma State University
HHP 4063 Neuroanatomy

Stillwater, OK
Fall 2022

PEER REVIEWED JOURNAL PUBLICATIONS

1. Lopes dos Santos M, **Shields JE**, Berton R, Dinyer-McNeely TK, Trevino MA, Anderson OA, and Dawes JJ. Does box jump height matter? A comparative analysis of box height on box jump performance in men and women. *Int J Exerc Sci*, 17 (1): 720-729.
2. MacLennan RJ, Hernandez-Sarabia JA, Reese SM, **Shields JE**, Smith CM, Stute K, Collyar J, Olmos AA, Danielson TL, MacLennan DL, Pagan JI, Girts RM, Coker NA, Carr JC, Ye X, Perry JW, Stock MS, and DeFreitas JM, 2024. Determining fNIRS ability to discern laterality of lower body contractions, *Exp Brain Res*, 1-12. <https://doi.org/10.1007/s00221-024-06798-8>
3. Leal-Alfaro ED, **Shields JE**, Zaragoza JA, Lopes dos Santos M, Dawes JJ, and Smith DB., 2024. Correlation between lower-body strength and performance tests among female NCAA Division II softball players. *Int J Exerc Sci*, 17(4): 212-219.
4. Lopes dos Santos M, Berton R, **Shields JE**, Bishop C, Dinyer-McNeely TK, Anderson O, and Dawes JJ., 2023. Influence of box height on inter-limb asymmetry and box jump performance. *Symmetry*, 15(7): 1359. <https://doi.org/10.3390/sym15071359>.
5. MacLennan RJ, Harmon KK, **Shields JE**, Andrushko JW, Girts RM, and Danielson TL., 2021. Aspects of cortical area responsibilities while learning a visually cued spatiotemporal motor task. *Physiol J*, 599 (1): 13-14. <https://doi.org/10.1113/JP280647>.
6. Thompson BJ, Stock MS, **Shields JE**, Luera MJ, Munayer IK, Mota JA, Carrillo EC, and Olinghouse KD., 2015. Barbell deadlift training increases the rate of torque development and vertical jump performance in novices. *J Strength Cond Res*, 29(1): 1-10. DOI: 10.1519/JSC.0000000000000691

JOURNAL PUBLICATIONS- IN REVIEW

1. Mackey CS, Barrera-Curiel A, Thiele RM, Keefe MS, Deldin AR, **Shields JE**, and DeFreitas JM. Agonist-antagonist muscle interactions during dynamic and isometric contractions. Submitted to *JSAMS* on Jun 26, 2024.

JOURNAL PUBLICATIONS- IN PREPARATION

1. **Shields JE**, Hernandez-Sarabia JA, Lanza MB, Barrera-Curiel A, Luera MJ, and DeFreitas JM. A comparison of popular filters for surface electromyography.
2. **Shields JE**, Smith CM, Reese SM, Dos Santos ML, Parodi M, and DeFreitas JM. Quantifying the trainability of peripheral nerve function in young and older adults.
3. **Shields JE**, Smith CM, Reese SM, Dos Santos ML, Parodi M, and DeFreitas JM. Characteristics of muscle morphology and manual dexterity after hand grip training.
4. **Shields JE**, Dos Santos ML, Comana S, Deutch A, and Luera MJ. Does lower-limb muscle morphology predict box jump performance in young adults?
5. **Shields JE**, Hernandez-Sarabia JA, Mackey CS, Barrera-Curiel A, Luera MJ, and DeFreitas JM. Comparison of agonist-antagonist fatigue on muscle activation and force production capabilities.
6. Reese SM, Smith CM, **Shields JE**, Olmos AA, Voskuil CC, Ye X, Stock MS, Carr JC, and DeFreitas JM. The effects of mirror illusion and contraction type on interhemispheric inhibition.
7. Luera MJ, Crawford SC, Bozarth E, Walker, N, **Shields, JE**, MacLennan RJ, Estrada, C, and

DeFreitas, JM. Manual versus semi-automated detection of muscle fascicle pennation angle of the vastus lateralis.

RESEARCH FUNDING

1. **Shields JE.** Principal Investigator. Stetson University Summer Grant Program, 2023, DeLand, FL. **\$5,000-funded.**
Methodological Considerations for Peripheral Nerve Stimulation.
 2. DeFreitas JM and **Shields JE.** Oklahoma Center for Advancement of Science and Technology (OCAST), Health Research Postdoctoral Fellowship, 2022. Stillwater, OK. \$150,000-not funded.
The Efficacy of an Exercise Intervention to Improve Peripheral Nerve Function in Older Adults.
 3. **Shields, JE.** Principal Investigator. Central States American College of Sports Medicine, Doctoral Student Research Grant, 2022. Stillwater, OK. **\$1,500-funded.**
Quantifying the Trainability of Peripheral Nerve Function in Young and Older Adults.
 4. **Shields, JE.** Principal Investigator. American Federation for Aging Research. Diana Jacobs Kalman/AFAR Scholarships for Research in the Biology of Aging, 2022. Stillwater, OK. \$5,000-not funded.
Quantifying the Trainability of Peripheral Nerve Function in Young and Older Adults.
 5. DeFreitas JM, **Shields JE,** and MacLennan RJ. Project Coordinator. Oklahoma State University, President's Fellows Faculty Research Award (Awarded to DeFreitas JM), 2021. Stillwater, OK. **\$20,000-funded.**
Improving Measurements of Neuromuscular Function.
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ORAL PRESENTATIONS

1. Tarleton State University, Stephenville, TX June 2024
Title: *Understanding Peripheral Nerve Stimulation.*
 2. Central States American College of Sports Medicine, Tulsa, OK March 2023
Title: *Quantifying the Trainability of Peripheral Nerve Function in Young and Older Adults.*
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CONFERENCE PROCEEDINGS- ABSTRACTS

1. **Shields JE,** Smith CM, Reese SM, Dos Santos ML, and DeFreitas JM. Age related changes in hand grip strength and motor dexterity after four weeks of training. American College of Sports Medicine Annual Meeting, 2024, Boston, MA.
2. **Shields JE,** Dos Santos ML, Smith CM, Reese SM, and DeFreitas JM. Four weeks of resistance training may improve peripheral nerve function in both young and older adults. Neuroscience 2023, Washington D.C.
3. Reese SM, Smith CM, **Shields JE,** Olmos AA, Voskuil CC, Ye X, Stock MS, Carr JC, and DeFreitas JM. The effects of mirror illusion and contraction type on interhemispheric inhibition. Neuroscience 2023, Washington D.C.
4. Smith CM, Reese SM, **Shields JE,** Olmos AA, Voskuil CC, Ye X, Stock MS, Carr JC, and DeFreitas JM. The prevalence of ipsilateral silent periods as a measure of interhemispheric inhibition during mirror illusions. Neuroscience 2023, Washington D.C.

5. **Shields JE**, Smith CM, Reese SM, Dos Santos ML and DeFreitas JM. Quantifying the trainability of peripheral nerve function in young and older adults. American College of Sports Medicine Annual Meeting, 2023, Denver, CO.
6. Smith CM, **Shields JE**, Reese SM, Dos Santos ML and DeFreitas JM. Is nerve size sensitive to potential changes in neuron size? A preliminary study. American College of Sports Medicine Annual Meeting, 2023, Denver, CO.
7. Smith CM, **Shields JE**, Reese SM, Dos Santos ML and DeFreitas JM. Do nerves grow in response to resistance training? A preliminary study. Submitted to: Central States American College of Sports Medicine Annual Meeting, 2023, Tulsa, OK.
8. Reese SM, Smith CM, Olmos AA, **Shields JE**, Voskuil CC, Ye X, Stock MS, Carr JC and DeFreitas JM. Does the contraction type performed during mirror illusion alter hemispheric communication? A preliminary analysis. Submitted to: Central States American College of Sports Medicine Annual Meeting, 2023, Tulsa, OK.
9. MacLennan RJ, Hernandez-Sarabia J, Reese SM, **Shields JE**, Smith CM, Stute K, Collyar J, Olmos AA, Danielson TL, MacLennan DL, Pagan JI, Girts RM, Harmon KK, Coker N, Carr JC, Ye X, Perry JW, Stock MS, and DeFreitas JM. fNIRS brain imaging is capable of discerning hemispheric laterality during lower-body contractions. Submitted to: Central States American College of Sports Medicine Meeting, 2023, Tulsa, OK.
10. Chavez L, Barrera-Curiel A, **Shields JE**, Hernandez-Sarabia JA, Danielson TL, MacLennan RJ, and DeFreitas JM. Is there a relationship between antagonist coactivation and reaction time during dual tasks? American College of Sports Medicine Annual Meeting, 2022, San Diego, CA.
11. **Shields JE**, MacLennan RJ, Smith CM, Reese SM, Olmos AA, and DeFreitas JM. Examining the enigmatic relationship between muscle size and strength: a disuse study. Central States American College of Sports Medicine Annual Meeting, 2022, Fayetteville, AK.
12. Smith CM, **Shields JE**, MacLennan RJ, Reese SM, Olmos AA, and DeFreitas JM. The effects of disuse from lower limb immobilization on proprioception. Central States American College of Sports Medicine Annual Meeting, 2022, Fayetteville, AK.
13. Reese SM, **Shields JE**, MacLennan RJ, Smith CM, Olmos AA, and DeFreitas JM. Does the magnitude of muscle atrophy from limb immobilization depend on how much muscle there was to start? Central States American College of Sports Medicine Annual Meeting, 2022, Fayetteville, AK.
14. Sevilla-Rodriguez O, Barrera-Curiel A, **Shields JE**, Danielson TL, Hernandez-Sarabia J, MacLennan RJ, Chavez L, and DeFreitas JM. Is there a relationship between cortical silent period and the level of coactivation during a maximal contraction? California Conference on Motor Behavior and Sport & Exercise Psychology, 2021, virtual.
15. Martin T, Barrera-Curiel A, **Shields JE**, Danielson TL, Hernandez-Sarabia JA, MacLennan RJ, Delgadillo N, and DeFreitas JM. Is there a relationship between corticospinal conduction velocity and reaction time? California Conference on Motor Behavior and Sport & Exercise Psychology, 2021, virtual.
16. Walker N, Hernandez-Sarabia JA, Estrada C, **Shields JE**, MacLennan RJ, DeFreitas JM, Crawford S, and Luera MJ. Manual versus semi-automated detection of muscle fascicle pennation angle of the vastus lateralis. Texas American College of Sports Medicine Annual Meeting, 2021, virtual.

17. Richardson L, Luera MJ, **Shields JE**, MacLennan RJ, Trevino MA, Del Vecchio A, and DeFreitas JM. A comparison of techniques for decomposing surface electromyography signals during high-intensity contractions a preliminary analysis. Texas American College of Sports Medicine Annual Meeting, 2021, virtual.
18. **Shields JE**, Hernandez-Sarabia JA, Barrera-Curiel A, Luera MJ, and DeFreitas JM. Does Muscle Glycogen Content Account for the Contralateral Force Deficit During Unilateral Fatigue? American College of Sports Medicine Annual Meeting 2020, virtual.
19. **Shields JE**, Hernandez-Sarabia JA, Barrera-Curiel A, Luera MJ, and DeFreitas JM. Does Muscle Glycogen Content Account for the Contralateral Force Deficit During Unilateral Fatigue? Central States American College of Sports Medicine Annual Meeting, 2019, Broken Arrow, OK.
20. Mota JA, Thompson BJ, Olinghouse KD, Carrillo EC, Munayer IK, Luera MJ, **Shields, JE**, Drusch A, and Stock MS. Barbell deadlift training increases the rate of torque development and vertical jump performance in novices. National Strength and Conditioning Association Annual Conference, 2014, Las Vegas, NV.
21. Mota JA, Stock MS, Olinghouse KD, Carrillo EC, Munayer IK, **Shields JE**, Luera MJ, and Thompson BJ. Linear progression for increased external loads during strength training. Texas American College of Sports Medicine Annual Meeting, 2014, Fort Worth, TX.
22. Olinghouse KD, Stock MS, Mota JA, Carrillo EC, Munayer IK, **Shields JE**, Luera MJ, and Thompson BJ. Effects of a ten week barbell deadlift training program on vertical jump height in college-aged women. Texas American College of Sports Medicine Annual Meeting, 2014, Fort Worth, TX.
23. Stodden DF, Lane AP, Tolleson DA, Carrillo EC, and **Shields, JE**. Pre-longitudinal screening of standing long jump component developmental sequences. Motor Development Research Consortium, 2013, Philadelphia, PA.
24. **Shields JE**, Stock MS, and Luera MJ. Test-retest reliability of peak and average concentric and eccentric isovelocity squat force. Poster presentation at the National Strength and Conditioning Association 36th Annual Conference and Exhibition, 2013, Las Vegas, NV.
25. **Shields JE**, Stock MS, Luera MJ, Munayer IK, and Young JC. Creatine kinase, lactate dehydrogenase, and myoglobin responses following repeated Wingate anaerobic tests versus barbell back squats: a pilot study. Poster presentation at the Texas American College of Sports Medicine Annual Meeting, 2013, Austin, TX.
26. Munayer IK, Stock MS, Luera MJ and **Shields JE**. Relationship between one repetition maximum strength and peak power output for the free-weight bench press exercise. Poster presentation at the Texas American College of Sports Medicine Annual Meeting, 2013, Austin, TX.
27. Luera MJ, Stock MS, **Shields JE**, and Munayer IK. Effects of diverting activities on recovery from repeated maximum voluntary contractions. Poster presentation at the Texas American College of Sports Medicine Annual Meeting, 2013, Austin, TX.
28. Yang HS, Boros R, Davies B, and **Shields JE**. The influence of prophylactic ankle braces on lower limb mechanics during a 90 degree side-step cutting task. Podium presentation at the 36th Annual Meeting of the American Society of Biomechanics, 2012, Gainesville, FL.

29. Yang HS, Boros R, Davies B, and **Shields JE**. The influence of prophylactic ankle braces on lower limb mechanics during a 90 degree side-step cutting task. Podium presentation at the South Regional American Society of Biomechanics Meeting, 2012, Dallas, TX.
30. Yang HS, Boros R, Davies B, and **Shields JE**. The influence of prophylactic ankle braces on lower limb mechanics during a 90 degree side-step cutting task. Poster presentation at the 11th Annual Graduate Student Research Poster Competition at Texas Tech University, 2012, Lubbock, TX

SERVICE	Stetson University	DeLand, FL
	<i>Stetson Showcase (Judge)</i>	2024
	<i>*Undergraduate Research symposium</i>	
	<i>Nerve Stimulation Workshop</i>	2024
	<i>QPR: Suicide Prevention Training</i>	2023
	 Oklahoma State University	 Stillwater, OK
	<i>Applied Neuromuscular Physiology Laboratory</i>	2022
	*Lab Coordinator	
	 <i>Upward Bound STEM Outreach</i>	 2022
	<i>STEM Outreach: Brain Blast</i>	2019
	<i>NASA STEM Pathways Activity Consortium</i>	2019

JOURNAL REFEREE

- Clinical Physiology and Functional Imaging Current
- Ad-Hoc Reviewer: **PLOS ONE** 2022

AWARDS AND HONORS

- Aix B. Harrison Endowed Scholarship 2022-2023
College of Education and Human Sciences Oklahoma State
- Betty Abercrombie Memorial Endowed Scholarship 2022-2023
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- Betty Abercrombie Memorial Endowed Scholarship 2020-2021
College of Education and Human Sciences Oklahoma State
- NSCA Foundation Women’s Scholarship 2013

PROFESSIONAL MEMBERSHIPS

- Society for Neuroscience (SfN)
- American College of Sports Medicine (ACSM)

UNDERGRADUATE HONORS STUDENTS/MENTEES

- **Stetson University**
 - April Deutsch (2024), and Sabrina Comana (2023-2024)
- **Oklahoma State University**
 - Jazen McKee, Cora Griffin, and Diego Diazvega (2022)
 - Josh Watts, Shaylyn Whiteley, and Mia Young (2021)

CERTIFICATIONS

- Adult First Aid/CPR/AED (American Red Cross)
 - Certificate ID: 01ERNAO

WORKSHOPS

- Nerve Conduction & Neuromuscular Ultrasound Workshop 2023
(*Cadwell*)