

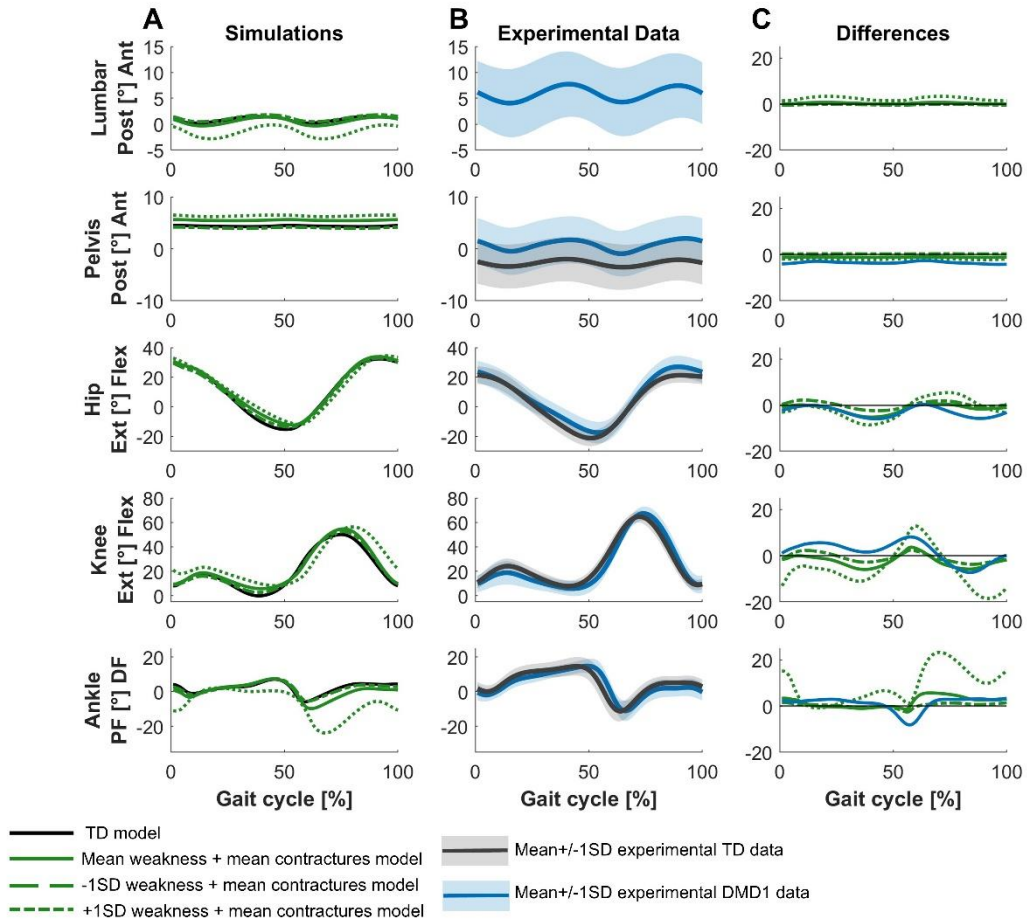


Figure S19: Sensitivity analysis of varying muscle weakness around its mean by ± 1 SD while holding contractures constant at their mean value on sagittal plane kinematics for DMD1. **A.** Simulated kinematics **B.** Experimental gait kinematics. **C.** Differences in kinematics between the TD model and the mean weakness + mean contractures model (solid line), the TD model and the -1SD weakness + mean contractures model (long dotted line), the TD model and the +1SD weakness + mean contractures model (short dotted line), and the experimental TD and DMD1 data (blue). Abbreviations: Ant, anterior; DF, dorsiflexion; Ext, extension; Flex, flexion; PF, plantar flexion; Post, posterior; TD, typically developing;

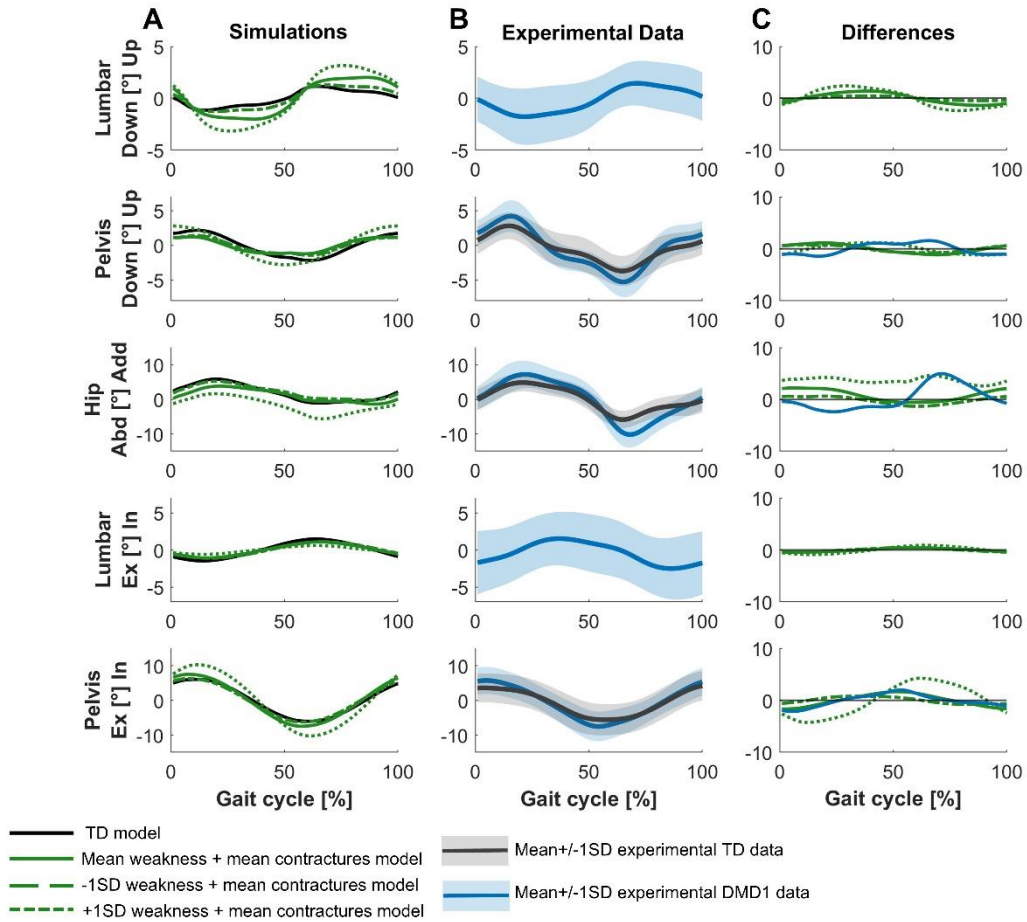


Figure S20: Sensitivity analysis of varying muscle weakness around its mean by ± 1 SD while holding contractures constant at their mean value on frontal and transverse plane kinematics for DMD1. **A.** Simulated kinematics **B.** Experimental gait kinematics. **C.** Differences in kinematics between the TD model and the mean weakness + mean contractures model (solid line), the TD model and the -1SD weakness + mean contractures model (long dotted line), the TD model and the +1SD weakness + mean contractures model (short dotted line), and the experimental TD and DMD1 data (blue). Abbreviations: Abd, abduction; Add, adduction; Ex, external; In, internal; TD, typically developing;

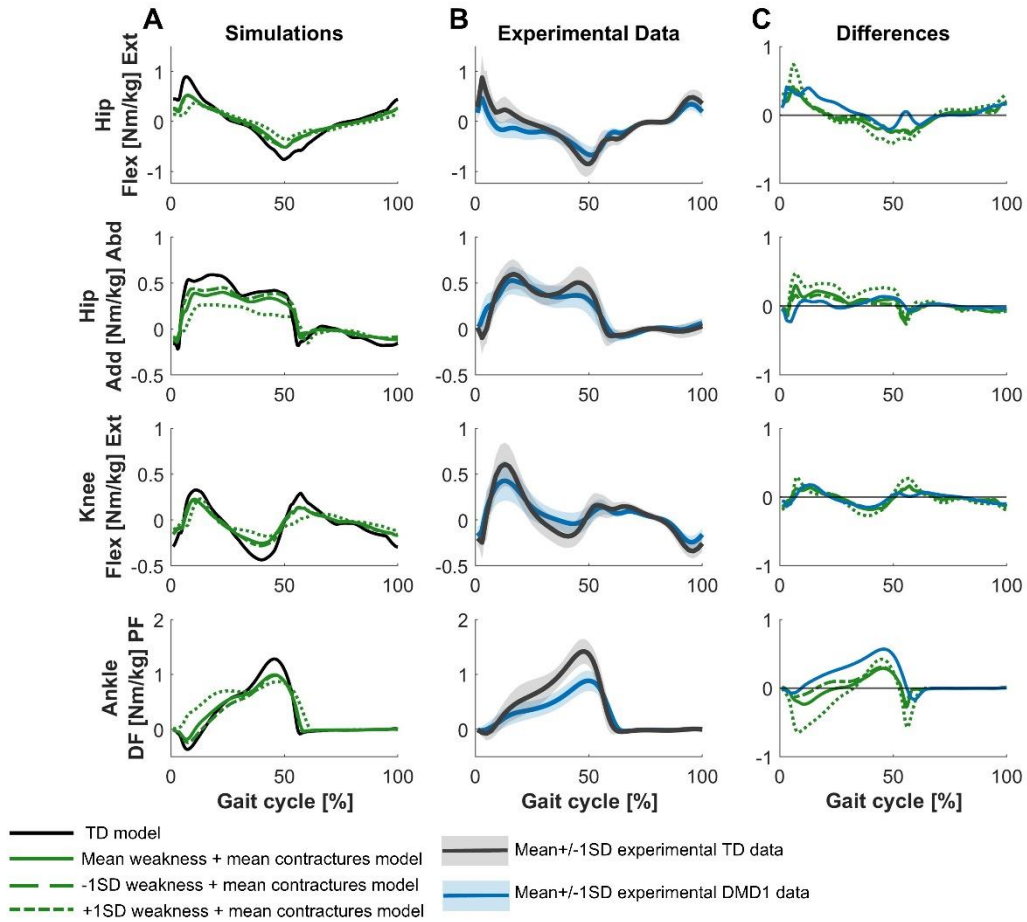


Figure S21: Sensitivity analysis of varying muscle weakness around its mean by ± 1 SD while holding contractures constant at their mean value on kinetics for DMD1. **A.** Simulated kinetics **B.** Experimental gait kinetics. **C.** Differences in kinetics between the TD model and the mean weakness + mean contractures model (solid line), the TD model and the -1SD weakness + mean contractures model (long dotted line), the TD model and the +1SD weakness + mean contractures model (short dotted line), and the experimental TD and DMD1 data (blue). Abbreviations: Abd, abduction; Add, adduction; DF, dorsiflexion; Ext, extension; Flex, flexion; PF, plantar flexion; TD, typically developing;

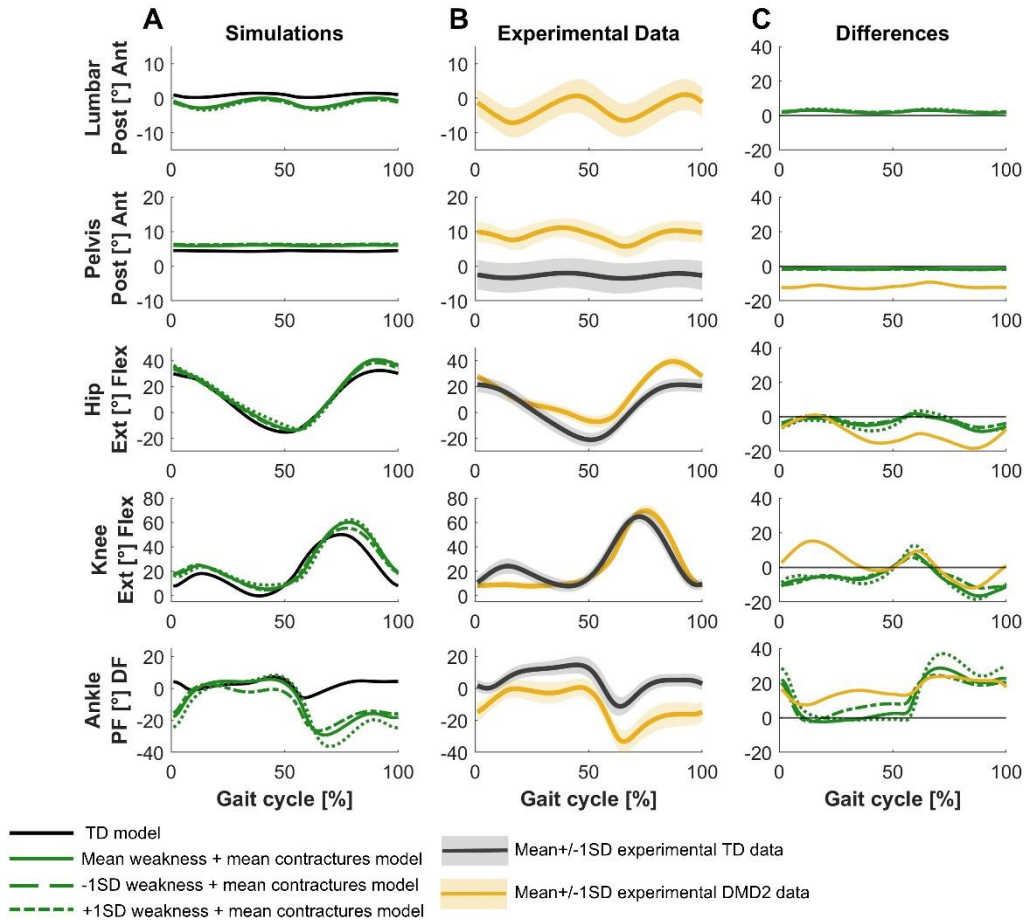


Figure S22: Sensitivity analysis of varying muscle weakness around its mean by ± 1 SD while holding contractures constant at their mean value on sagittal plane kinematics for DMD2. **A.** Simulated kinematics **B.** Experimental gait kinematics. **C.** Differences in kinematics between the TD model and the mean weakness + mean contractures model (solid line), the TD model and the -1SD weakness + mean contractures model (long dotted line), the TD model and the +1SD weakness + mean contractures model (short dotted line), and the experimental TD and DMD2 data (yellow). Abbreviations: Ant, anterior; DF, dorsiflexion; Ext, extension; Flex, flexion; PF, plantar flexion; Post, posterior; TD, typically developing;

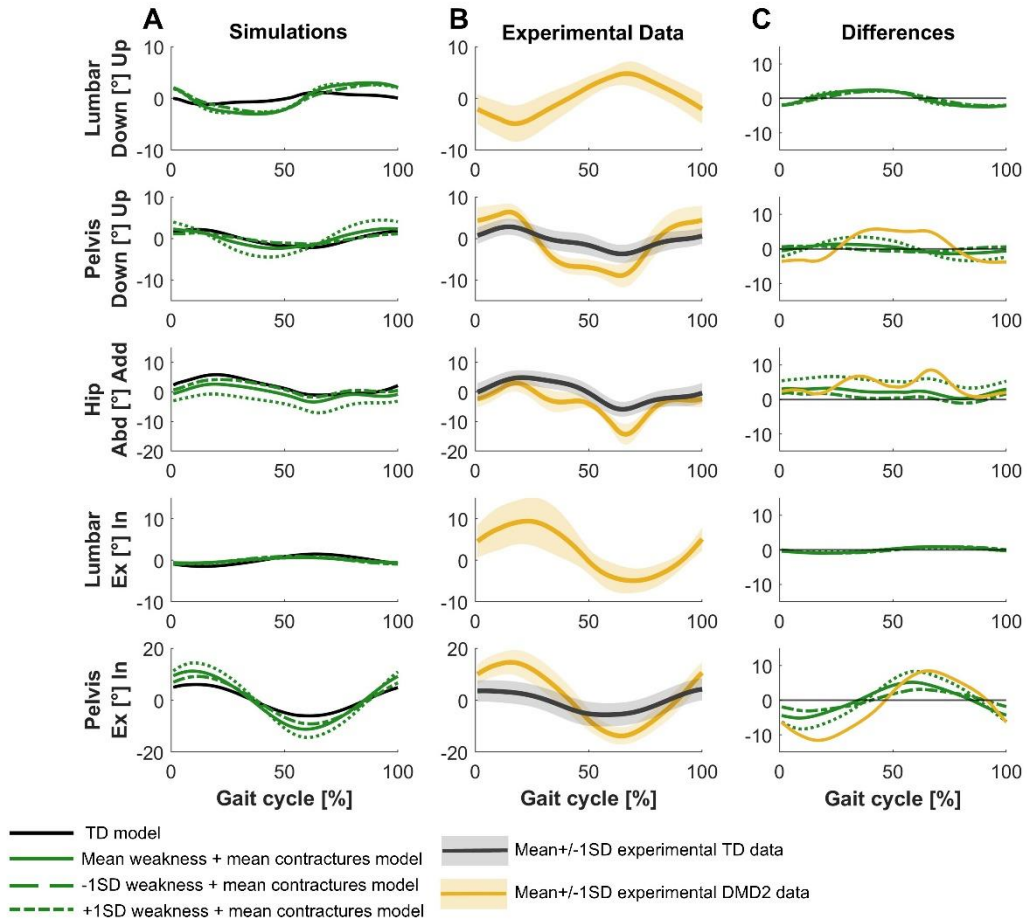


Figure S23: Sensitivity analysis of varying muscle weakness around its mean by ± 1 SD while holding contractures constant at their mean value on frontal and transverse plane kinematics for DMD2. **A.** Simulated kinematics **B.** Experimental gait kinematics. **C.** Differences in kinematics between the TD model and the mean weakness + mean contractures model (solid line), the TD model and the -1SD weakness + mean contractures model (long dotted line), the TD model and the +1SD weakness + mean contractures model (short dotted line), and the experimental TD and DMD2 data (yellow). Abbreviations: Abd, abduction; Add, adduction; Ex, external; In, internal; TD, typically developing;

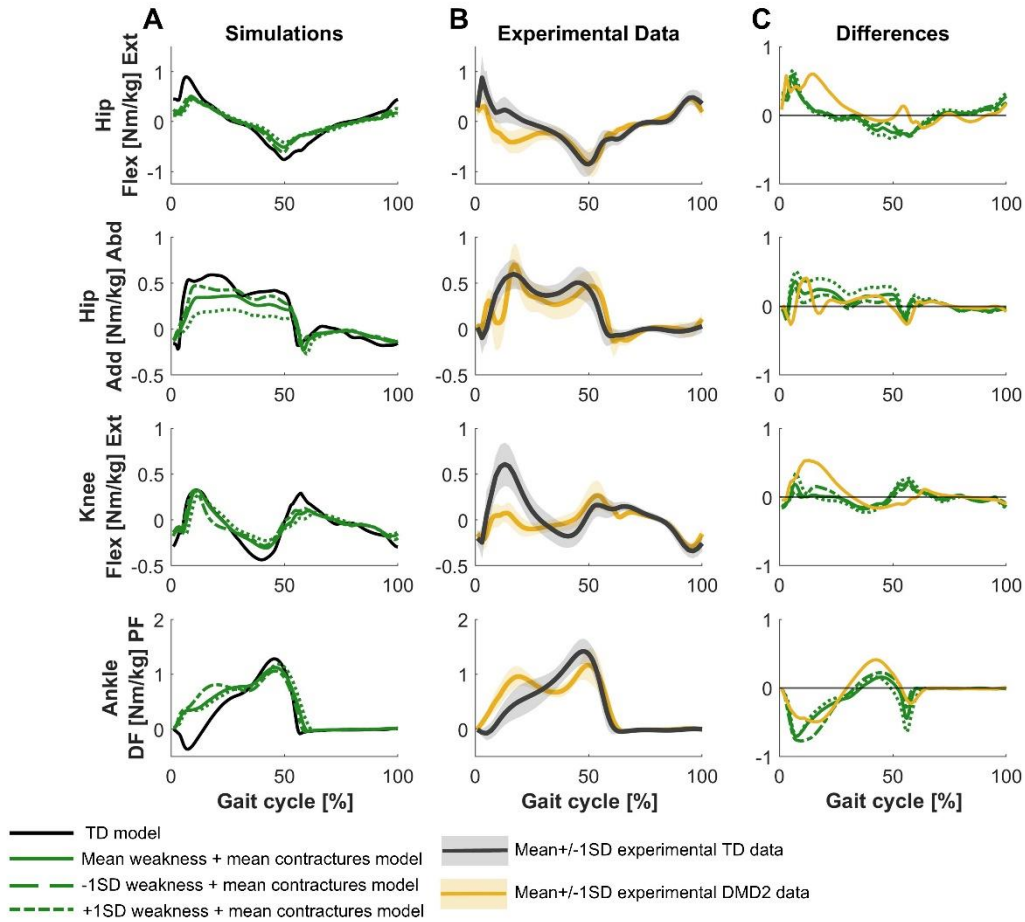


Figure S24: Sensitivity analysis of varying muscle weakness around its mean by ± 1 SD while holding contractures constant at their mean value on kinetics for DMD2. **A.** Simulated kinetics **B.** Experimental gait kinetics. **C.** Differences in kinetics between the TD model and the mean weakness + mean contractures model (solid line), the TD model and the -1SD weakness + mean contractures model (long dotted line), the TD model and the +1SD weakness + mean contractures model (short dotted line), and the experimental TD and DMD2 data (yellow). Abbreviations: Abd, abduction; Add, adduction; DF, dorsiflexion; Ext, extension; Flex, flexion; PF, plantar flexion; TD, typically developing;

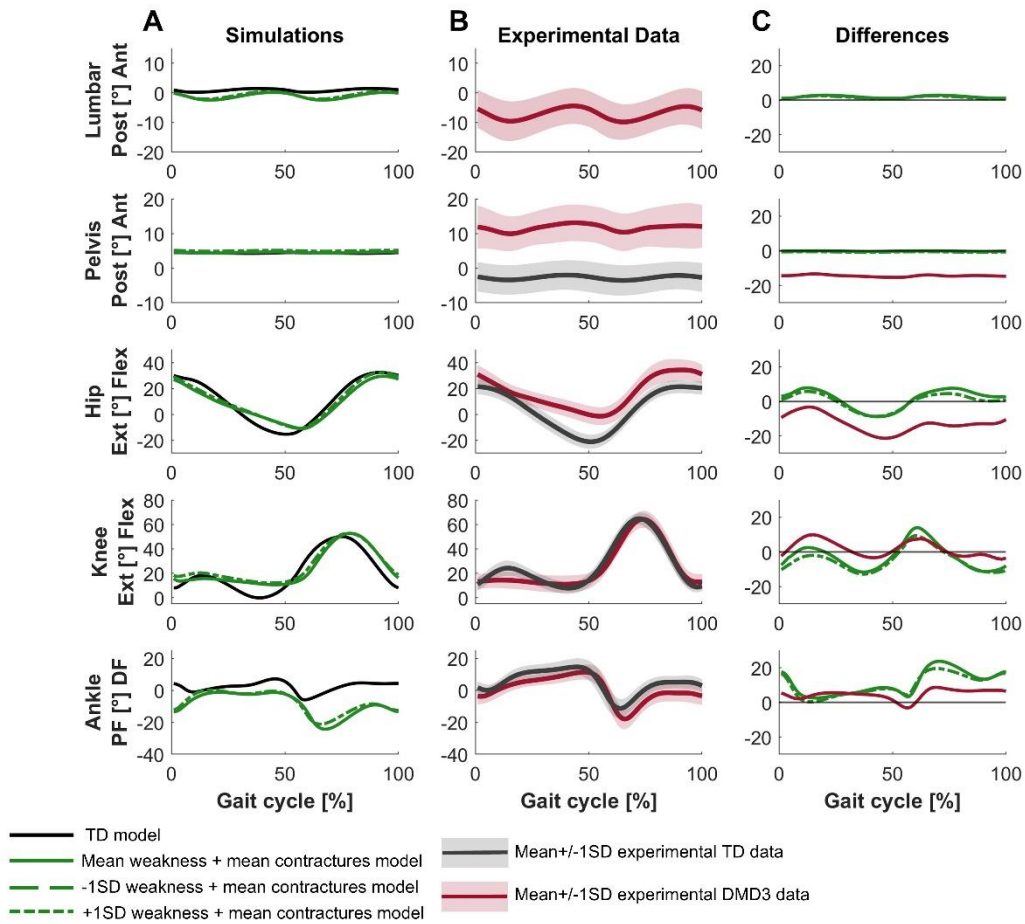


Figure S25: Sensitivity analysis of varying muscle weakness around its mean by ± 1 SD while holding contractures constant at their mean value on sagittal plane kinematics for DMD3. **A.** Simulated kinematics **B.** Experimental gait kinematics. **C.** Differences in kinematics between the TD model and the mean weakness + mean contractures model (solid line), the TD model and the -1SD weakness + mean contractures model (long dotted line), and the experimental TD and DMD3 data (red). The simulation based on the +1SD weakness and mean contractures model could not find a feasible solution for DMD3. Abbreviations: Ant, anterior; DF, dorsiflexion; Ext, extension; Flex, flexion; PF, plantar flexion; Post, posterior; TD, typically developing;

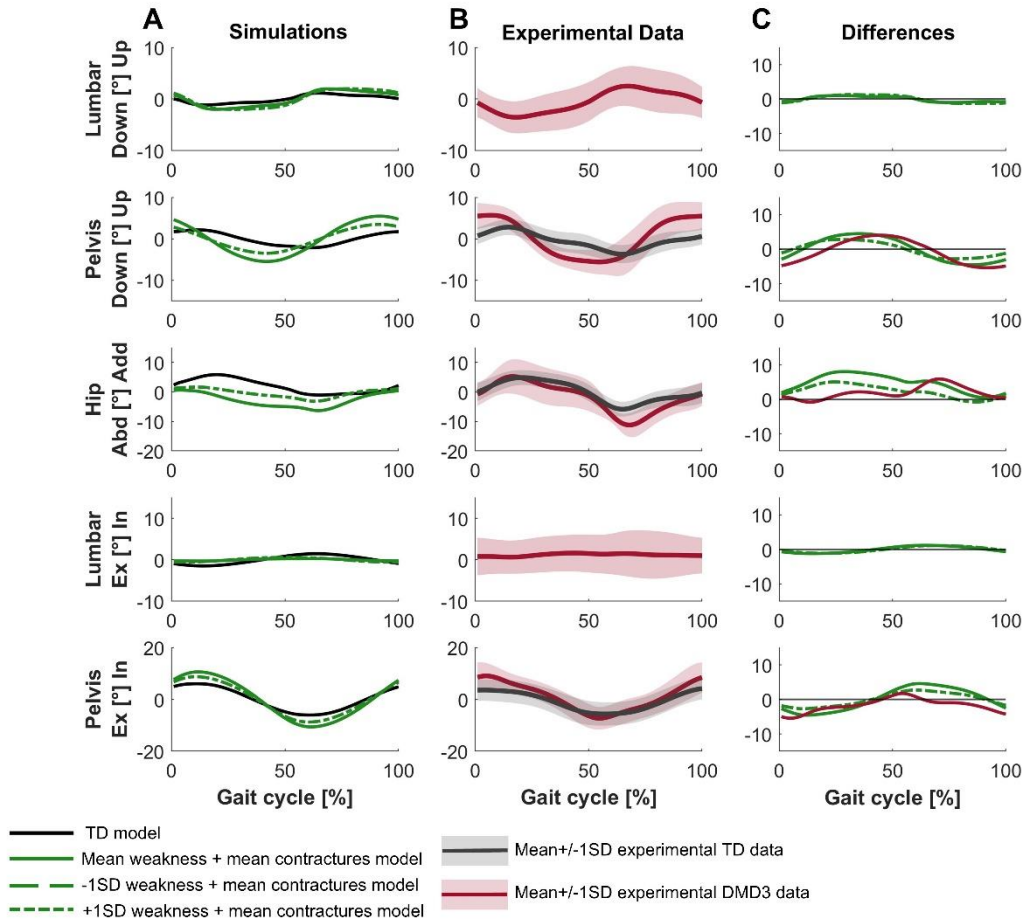


Figure S26: Sensitivity analysis of varying muscle weakness around its mean by ± 1 SD while holding contractures constant at their mean value on frontal and transverse plane kinematics for DMD3. **A.** Simulated kinematics **B.** Experimental gait kinematics. **C.** Differences in kinematics between the TD model and the mean weakness + mean contractures model (solid line), the TD model and the -1SD weakness + mean contractures model (long dotted line), and the experimental TD and DMD3 data (red). The simulation based on the +1SD weakness and mean contractures model could not find a feasible solution for DMD3. Abbreviations: Abd, abduction; Add, adduction; Ex, external; In, internal; TD, typically developing;

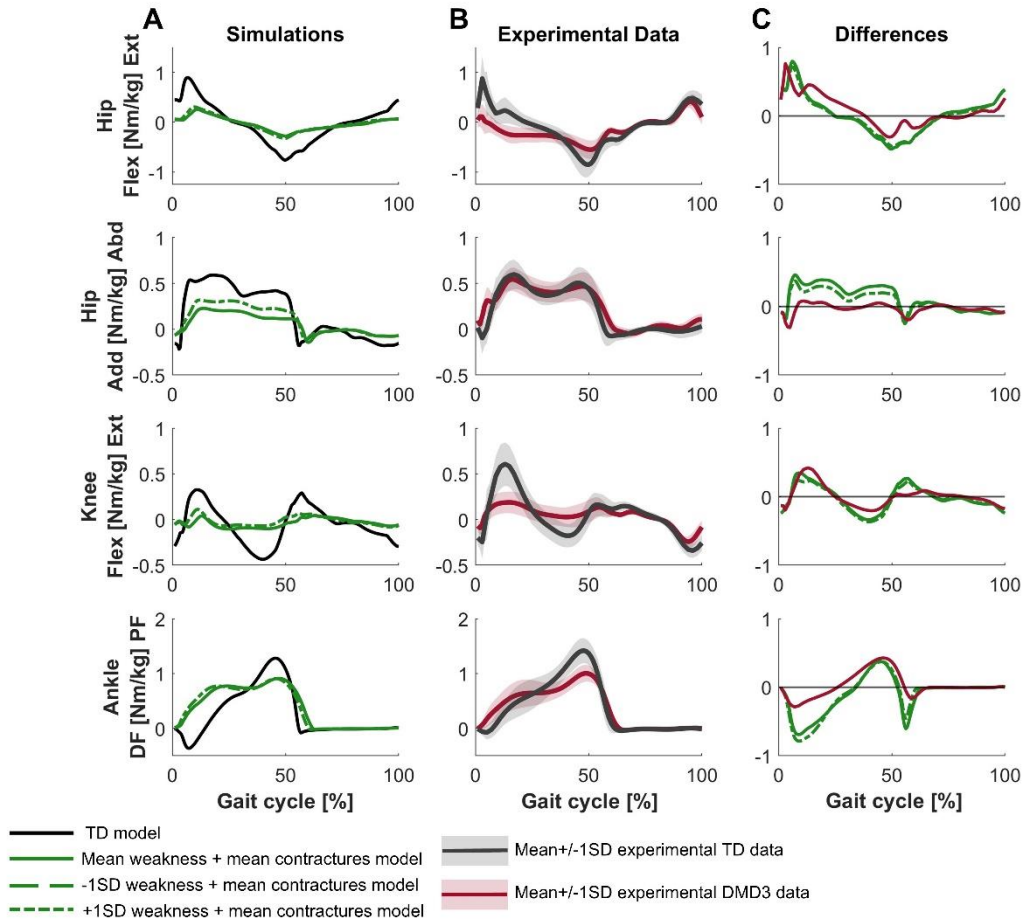


Figure S27: Sensitivity analysis of varying muscle weakness around its mean by ± 1 SD while holding contractures constant at their mean value on kinetics for DMD3. **A.** Simulated kinetics **B.** Experimental gait kinetics. **C.** Differences in kinetics between the TD model and the mean weakness + mean contractures model (solid line), the TD model and the -1SD weakness + mean contractures model (long dotted line), and the experimental TD and DMD3 data (red). The simulation based on the +1SD weakness and mean contractures model could not find a feasible solution for DMD3. Abbreviations: Abd, abduction; Add, adduction; DF, dorsiflexion; Ext, extension; Flex, flexion; PF, plantar flexion; TD, typically developing;