

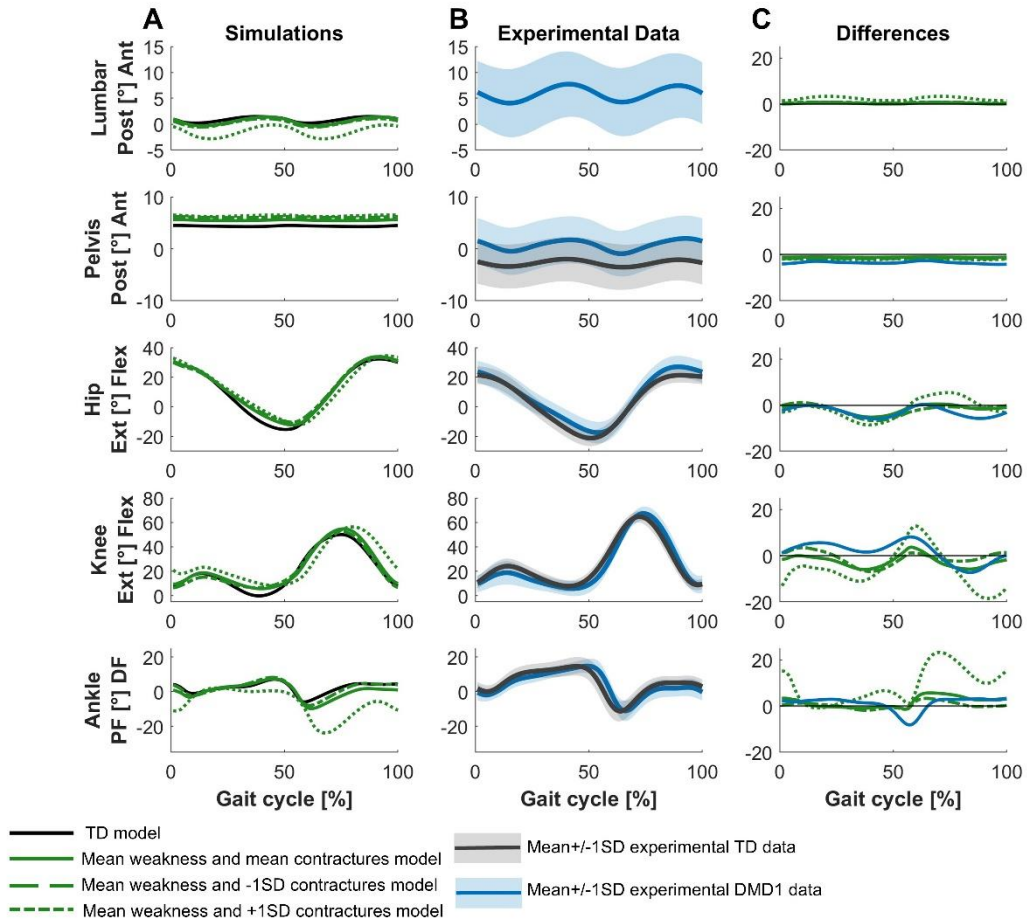


Figure S10: Sensitivity analysis varying contractures around their mean value by ± 1 SD while holding muscle weakness constant at its mean value on sagittal plane kinematics for DMD1. **A.** Simulated kinematics **B.** Experimental gait kinematics. **C.** Differences in kinematics between the TD model and the mean weakness + mean contractures model (solid line), the TD model and the mean weakness with -1SD contractures model (long dotted line), the TD model and the mean weakness with +1SD 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;

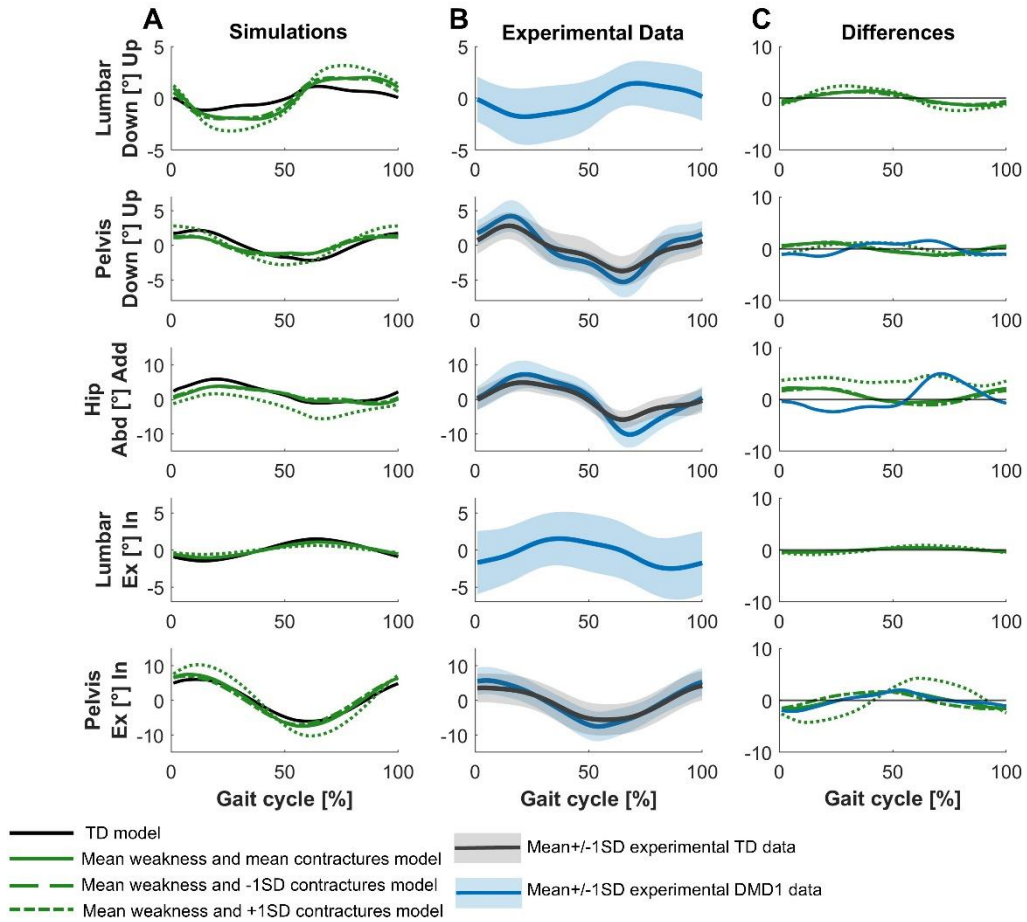


Figure S11: Sensitivity analysis varying contractures around their mean value by ± 1 SD while holding muscle weakness constant at its mean value on frontal and transverse plane kinematics for DMD1. **A.** Simulated kinematics **B.** Experimental gait kinematics. **C.** Differences in kinematics between the TD model and the mean weakness + mean contractures model (solid line), the TD model and the mean weakness with -1SD contractures model (long dotted line), the TD model and the mean weakness with +1SD 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;

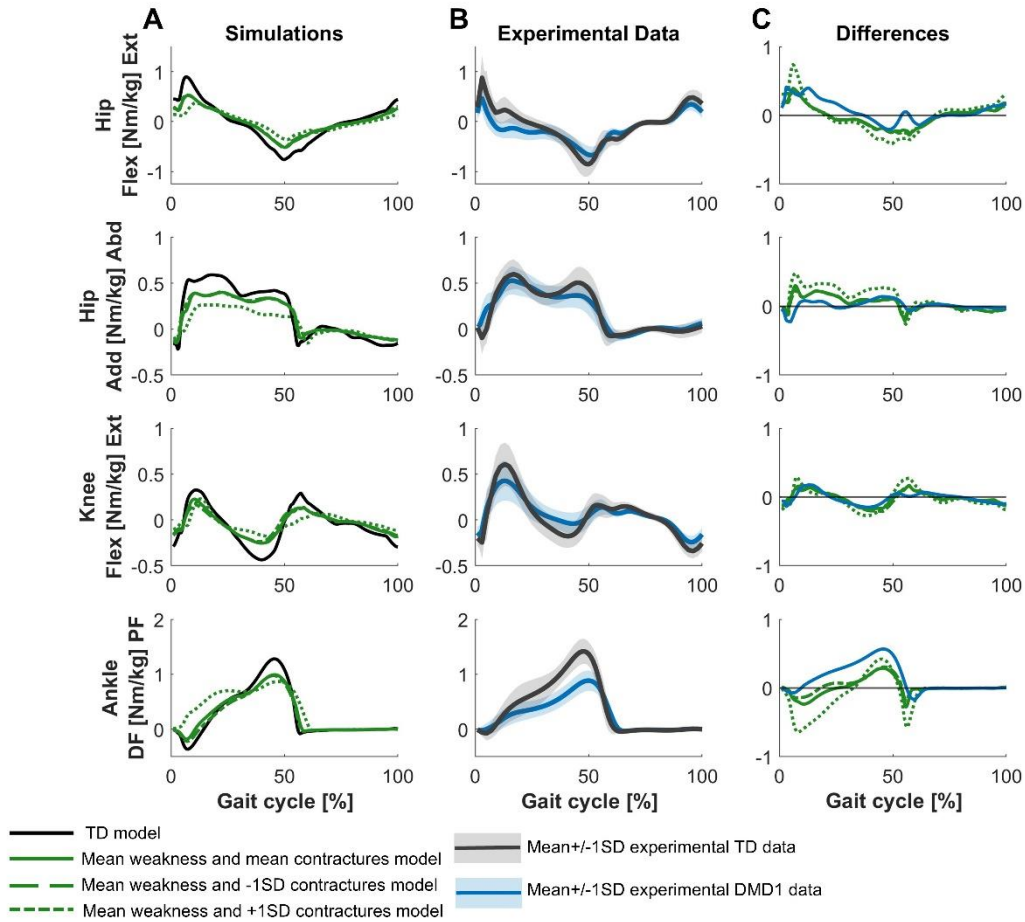


Figure S12: Sensitivity analysis varying contractures around their mean value by ± 1 SD while holding muscle weakness constant at its mean value on kinetics for DMD1. **A.** Simulated kinetics **B.** Experimental gait kinetics. **C.** Differences in kinetics between the TD model and the mean weakness + mean contractures model (solid line), the TD model and the mean weakness with -1SD contractures model (long dotted line), the TD model and the mean weakness with +1SD 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;

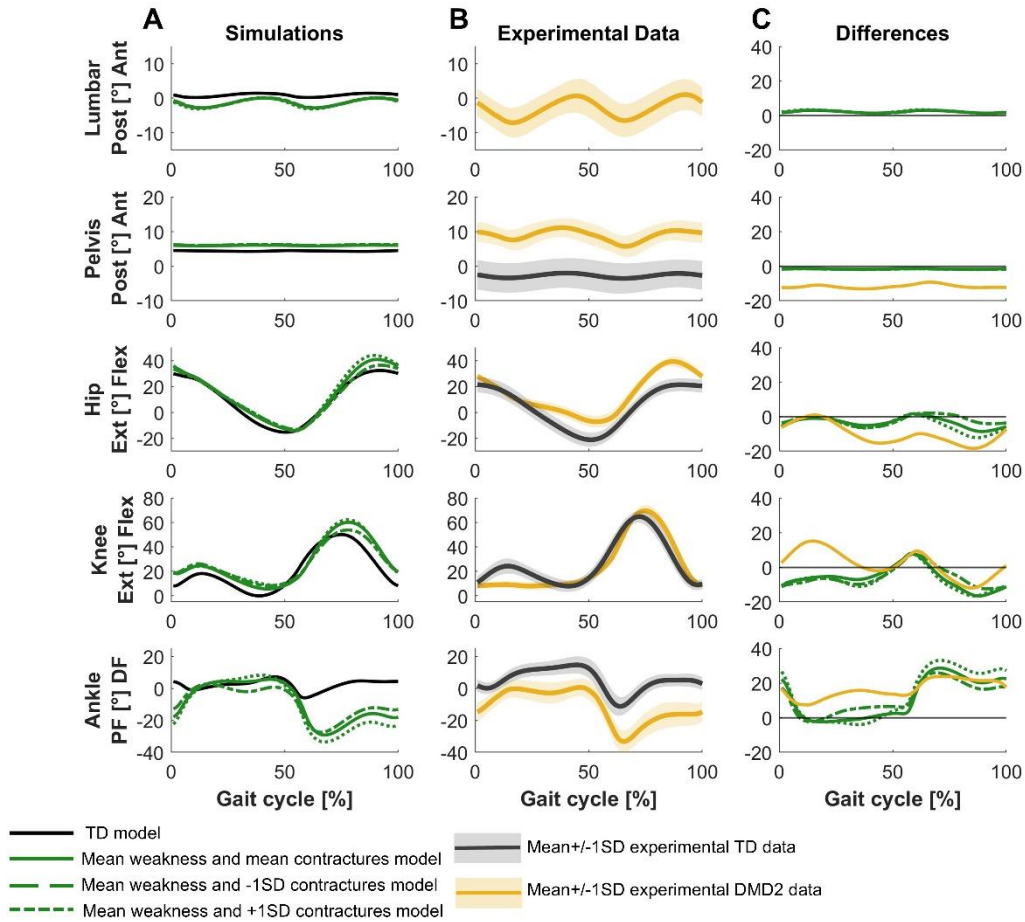


Figure S13: Sensitivity analysis varying contractures around their mean value by ± 1 SD while holding muscle weakness constant at its mean value on sagittal plane kinematics for DMD2. **A.** Simulated kinematics **B.** Experimental gait kinematics. **C.** Differences in kinematics between the TD model and the mean weakness + mean contractures model (solid line), the TD model and the mean weakness with -1SD contractures model (long dotted line), the TD model and the mean weakness with +1SD 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;

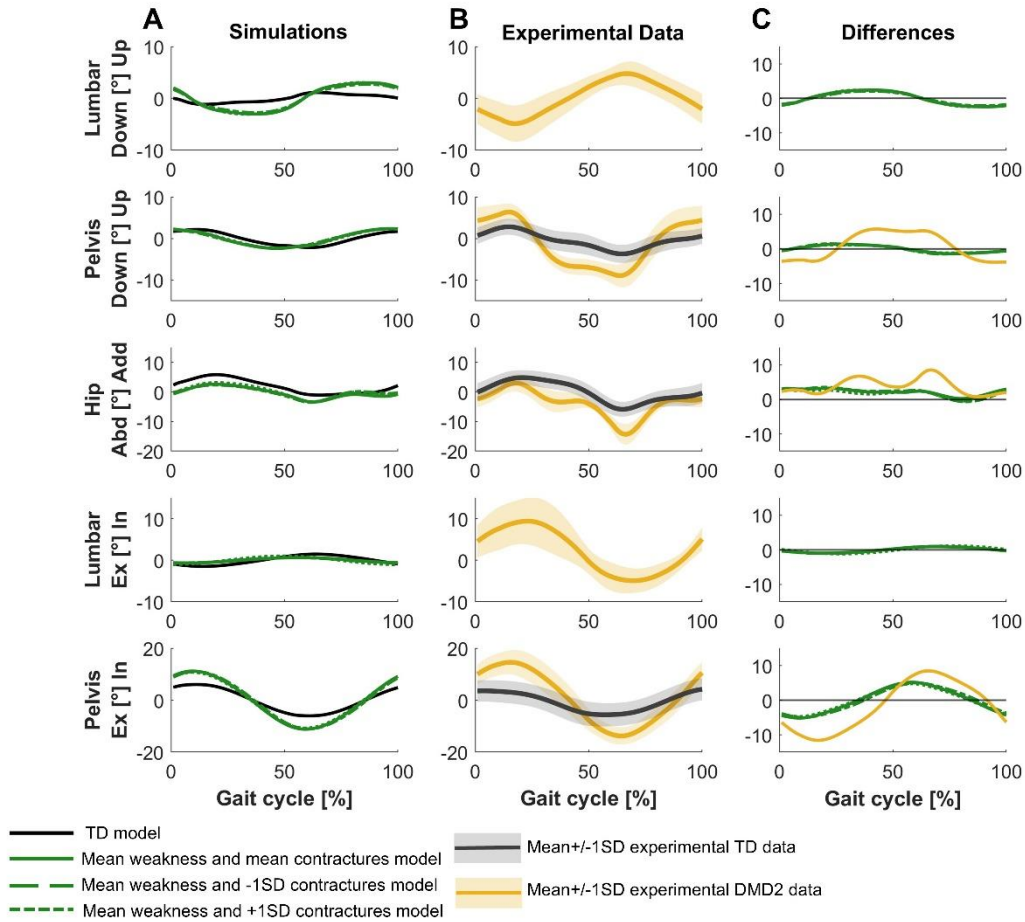


Figure S14: Sensitivity analysis varying contractures around their mean value by ± 1 SD while holding muscle weakness constant at its mean value on frontal and transverse plane kinematics for DMD2. **A.** Simulated kinematics **B.** Experimental gait kinematics. **C.** Differences in kinematics between the TD model and the mean weakness + mean contractures model (solid line), the TD model and the mean weakness with -1SD contractures model (long dotted line), the TD model and the mean weakness with +1SD 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;

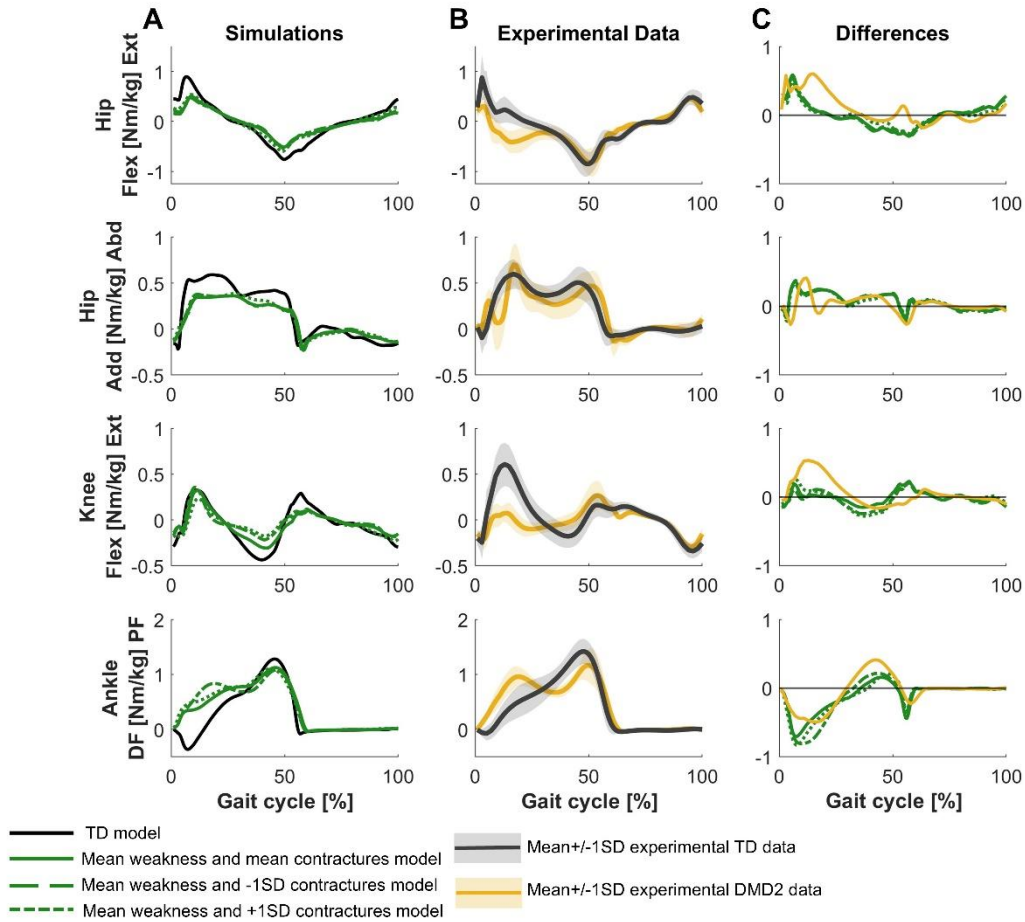


Figure S15: Sensitivity analysis varying contractures around their mean value by ± 1 SD while holding muscle weakness constant at its mean value on kinetics for DMD2. **A.** Simulated kinetics **B.** Experimental gait kinetics. **C.** Differences in kinetics between the TD model and the mean weakness + mean contractures model (solid line), the TD model and the mean weakness with -1SD contractures model (long dotted line), the TD model and the mean weakness with +1SD 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;

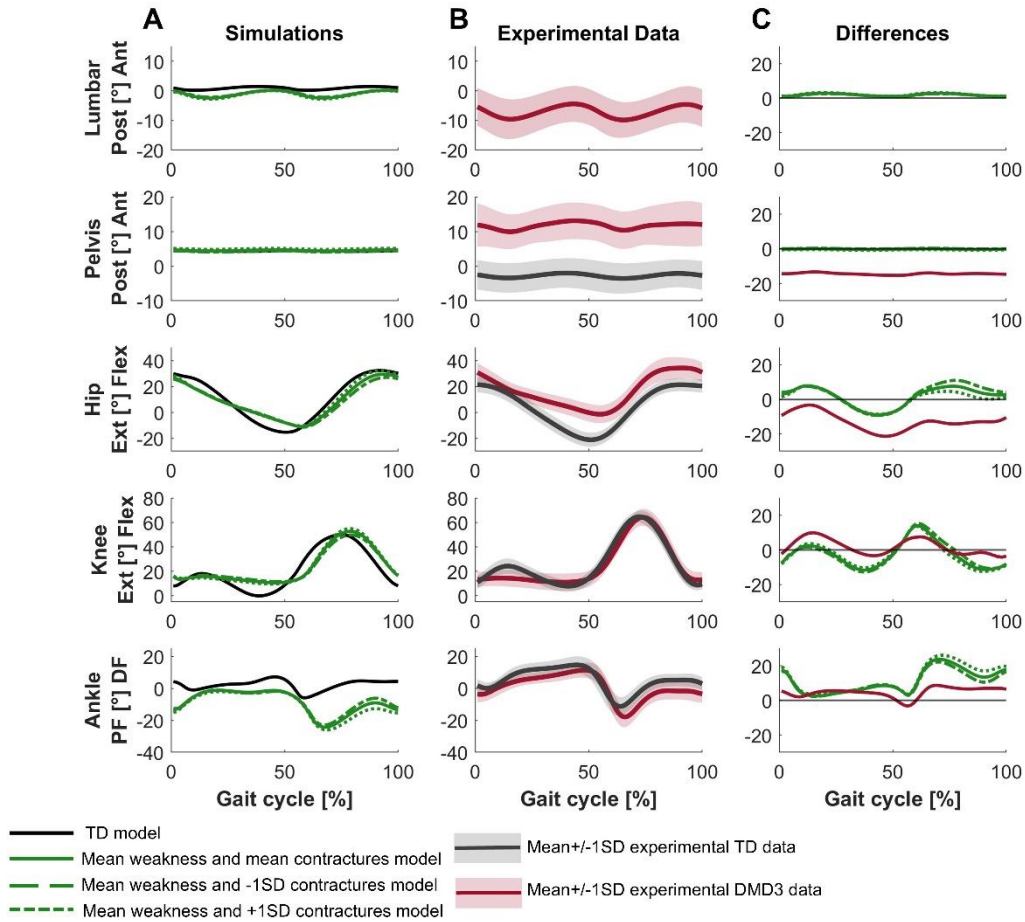


Figure S16: Sensitivity analysis varying contractures around their mean value by ± 1 SD while holding muscle weakness constant at its mean value on sagittal plane kinematics for DMD3. **A.** Simulated kinematics **B.** Experimental gait kinematics. **C.** Differences in kinematics between the TD model and the mean weakness + mean contractures model (solid line), the TD model and the mean weakness with -1SD contractures model (long dotted line), the TD model and the mean weakness with +1SD contractures model (short dotted line), and the experimental TD and DMD3 data (red). Abbreviations: Ant, anterior; DF, dorsiflexion; Ext, extension; Flex, flexion; PF, plantar flexion; Post, posterior; TD, typically developing;

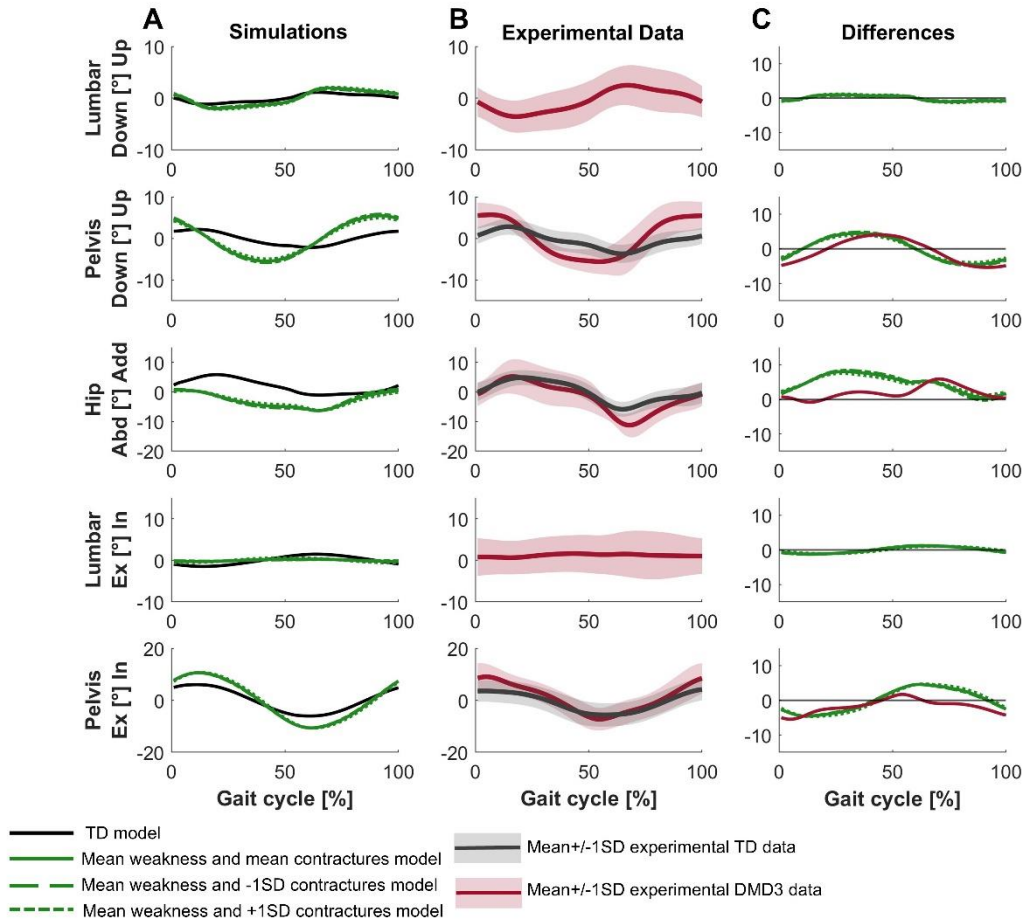


Figure S17: Sensitivity analysis varying contractures around their mean value by ± 1 SD while holding muscle weakness constant at its mean value on frontal and transverse plane kinematics for DMD3. **A.** Simulated kinematics **B.** Experimental gait kinematics. **C.** Differences in kinematics between the TD model and the mean weakness + mean contractures model (solid line), the TD model and the mean weakness with -1SD contractures model (long dotted line), the TD model and the mean weakness with +1SD contractures model (short dotted line), and the experimental TD and DMD3 data (red). Abbreviations: Abd, abduction; Add, adduction; Ex, external; In, internal; TD, typically developing;

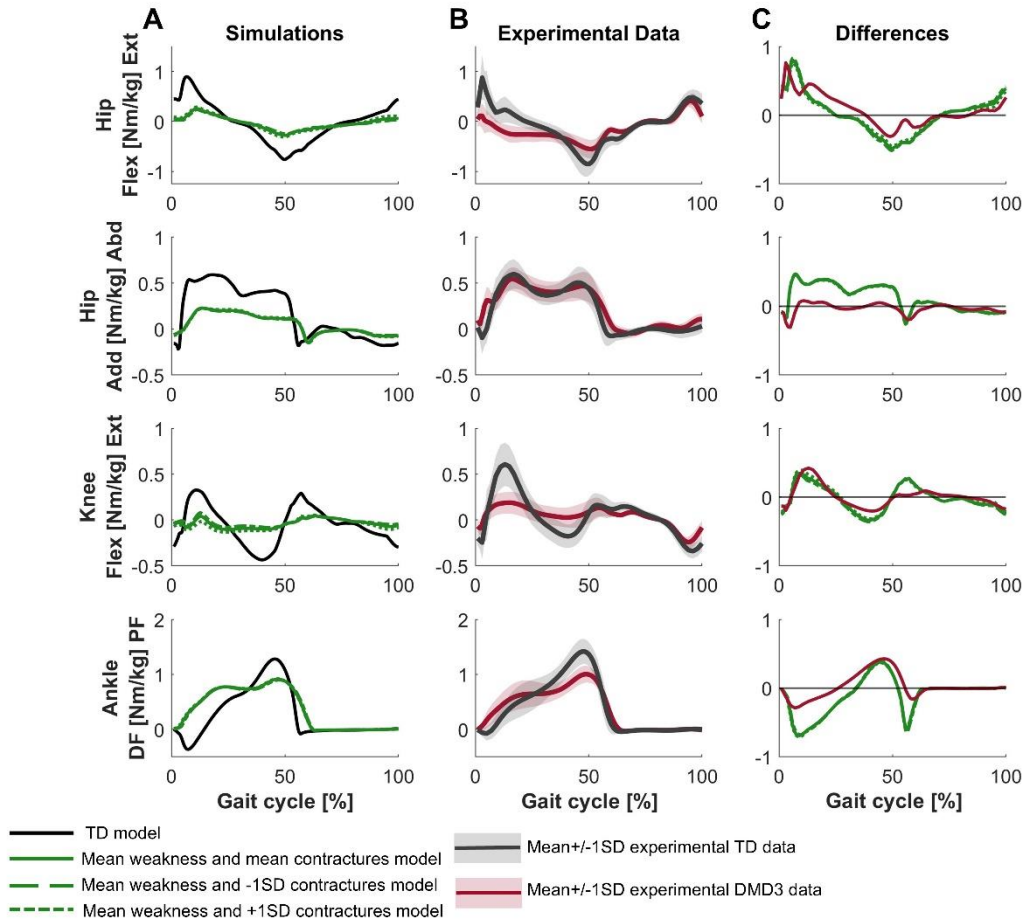


Figure S18: Sensitivity analysis varying contractures around their mean value by ± 1 SD while holding muscle weakness constant at its mean value on kinetics for DMD3. **A.** Simulated kinetics **B.** Experimental gait kinetics. **C.** Differences in kinetics between the TD model and the mean weakness + mean contractures model (solid line), the TD model and the mean weakness with -1SD contractures model (long dotted line), the TD model and the mean weakness with +1SD contractures model (short dotted line), and the experimental TD and DMD3 data (red). Abbreviations: Abd, abduction; Add, adduction; DF, dorsiflexion; Ext, extension; Flex, flexion; PF, plantar flexion; TD, typically developing;