Supplementary Digital Content

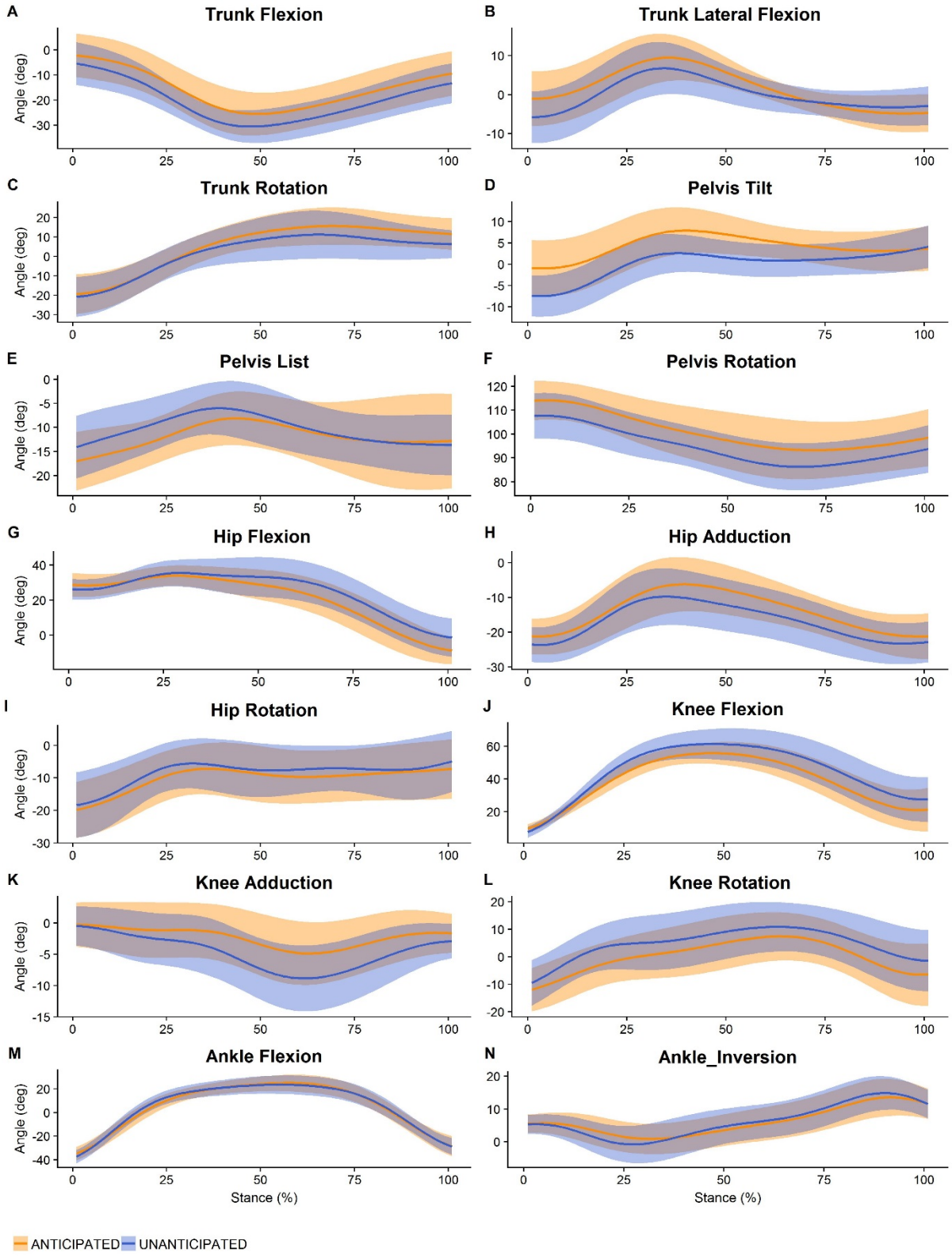

Figure 1: joint angles across 100% of stance during anticipated and unanticipated sidestep cutting. Positive (+) angle indicates trunk; extension, right-side lateral flexion, leftward rotation, pelvis; posterior tilt, right-side list, leftward rotation, hip; flexion, adduction, internal rotation, knee; flexion, adduction, internal rotation and ankle; dorsi flexion and inversion.

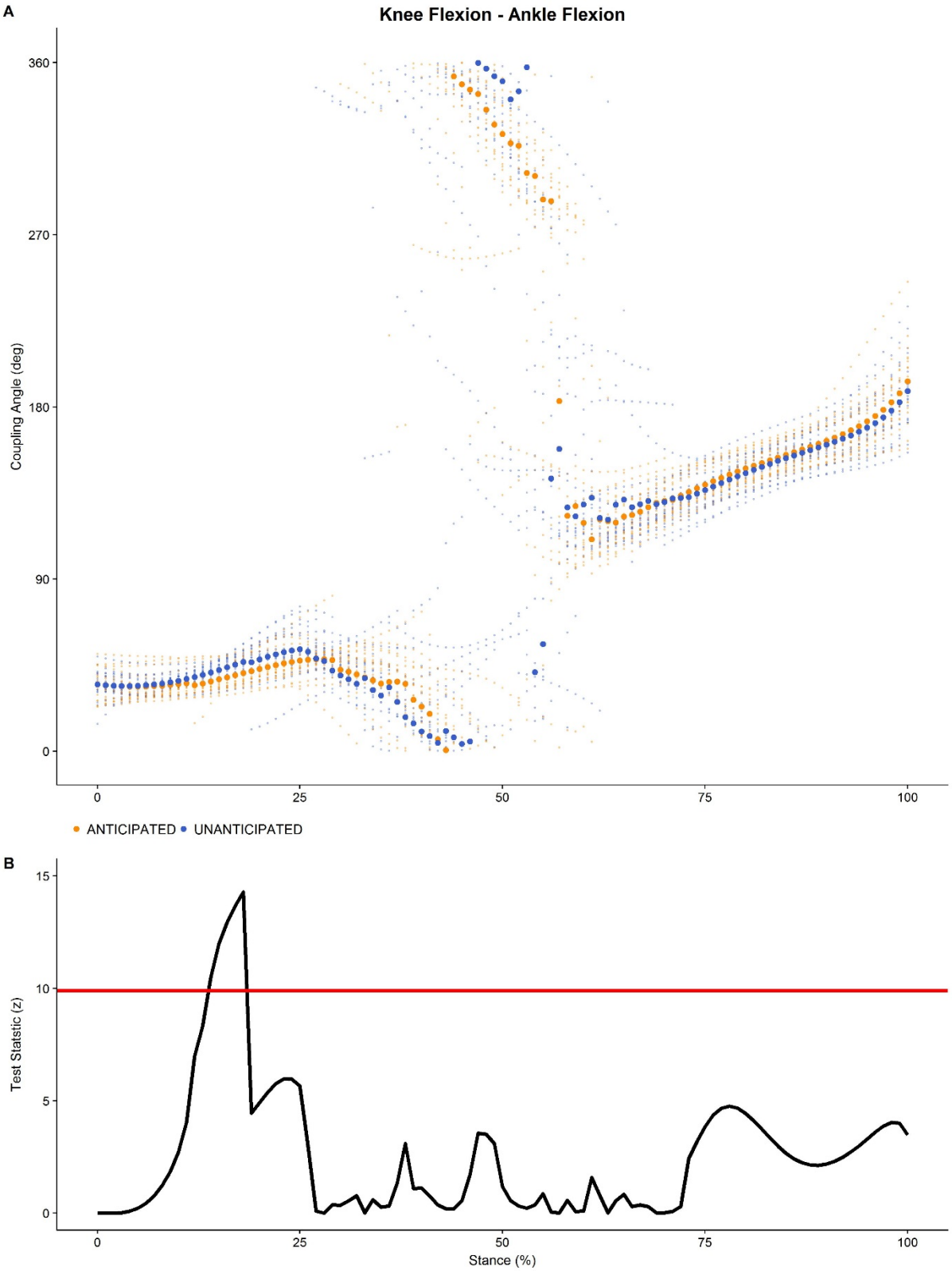

Figure 2: A) shows the knee flexion – ankle flexion coupling angle across the stance phase of anticipated and unanticipated sidestep cut. Larger points show the group mean coordination pattern, smaller points show individual participant patterns. B) Shows the associated test statistic plot. The critical threshold is highlighted by the red horizontal line, if the test statistic crosses this line a significant difference between conditions is associated with the corresponding portion of stance.

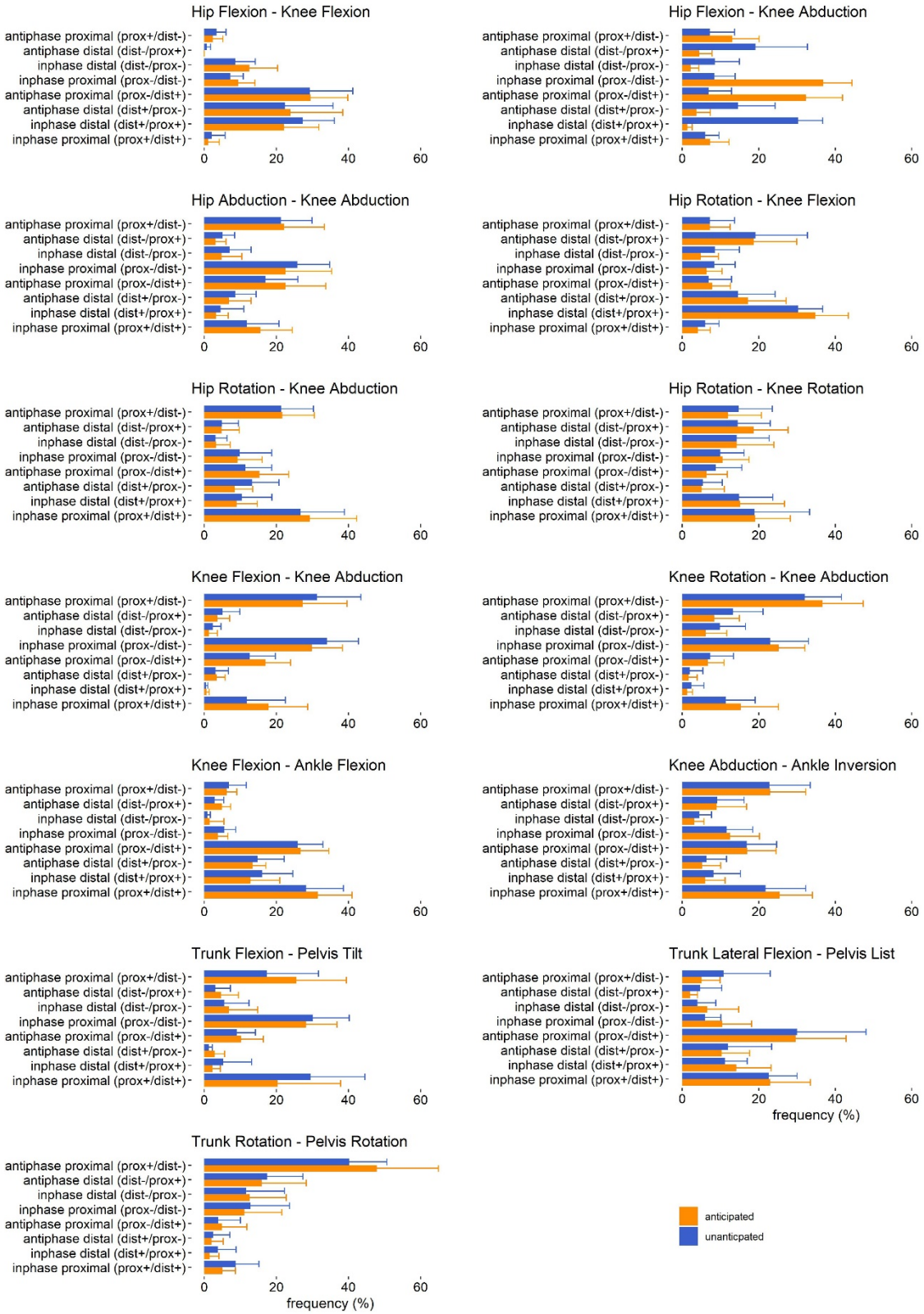

Figure 3: Coordination pattern frequency (±SD) of all coupling angles over the stance phase during anticipated and unanticipated sidestep cutting. Patterns are defined on y-axis as 'inphase' (segments rotating same direction) or 'antiphase' (segments rotating in opposite direction), 'proximal' or 'distal' dominancy, and the direction of movement of each angle in accordance with the following sign convention: Positive (+) angle indicates trunk extension, right-side lateral flexion and leftward rotation; pelvis posterior tilt, right-side list and leftward rotation; hip flexion, adduction and internal rotation; knee; flexion, adduction and internal rotation; ankle dorsi flexion and inversion.

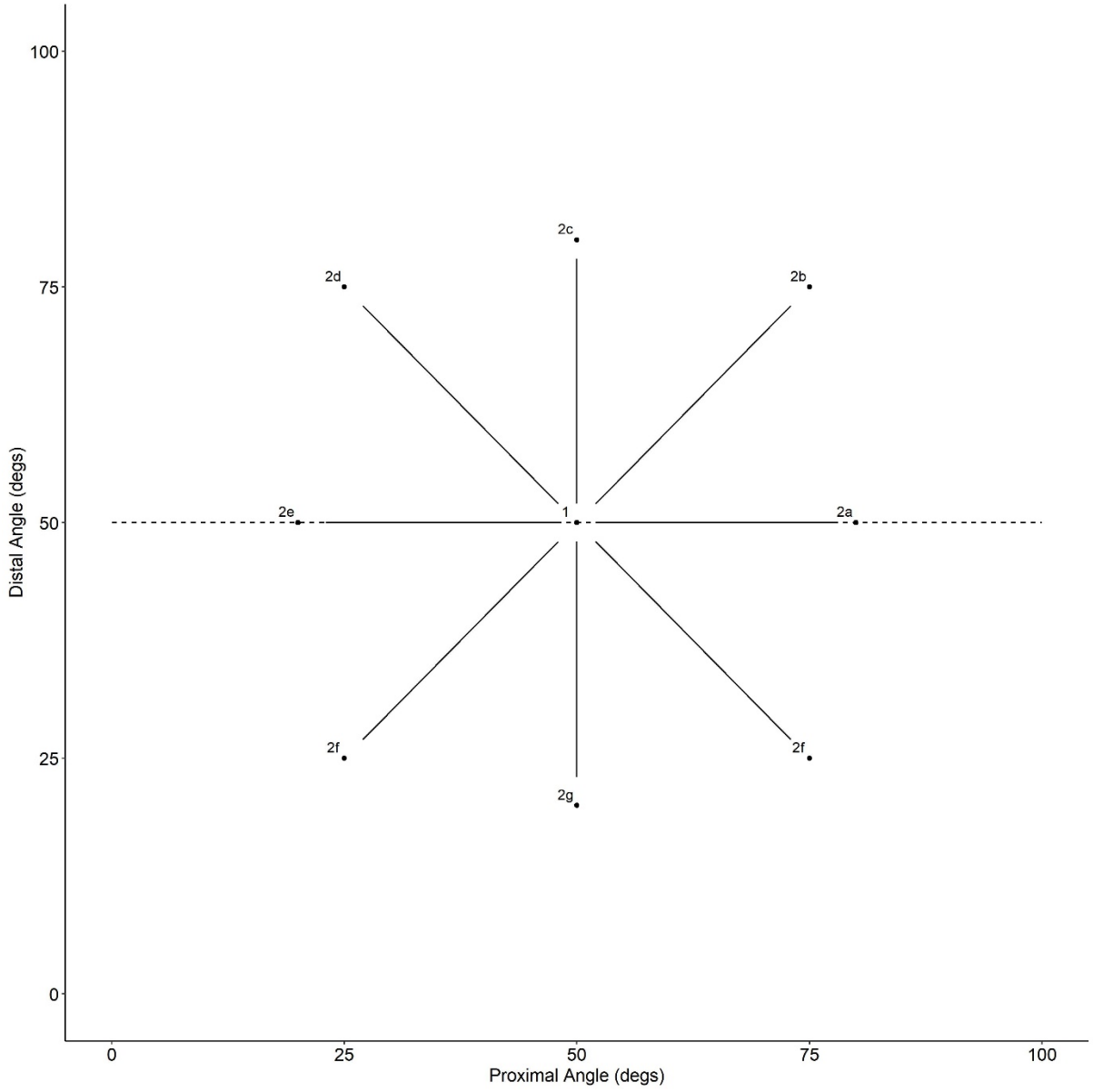

Figure 4: Example vector coding calculation. An angle-angle plot is created for the two joints of interest. Point 1 represents the example first data point (where both joints are at a hypothetical angle of 50^0), points 2a to 2f represent examples of where the second data point may fall on the angle-angle plot. The coupling angle between the two data points is then calculated in orientation to the right horizontal line, represented by dashed horizontal line. Therefore, the following coupling angles would be calculated: 1-2a = 0 or 360, 1-2b = 45, 1-2c = 90, 1-2d = 135, 1-2e = 180, 1-2f = 225, 1-2g = 270 and 1-2f = 315.

Table 1: Results of the binning analysis. Anticipated and unanticipated coupling angle data (±SD) is presented with the corresponding p value (alpha 0.05) between conditions.

Hip Flexion - Knee Flexion			
Phase	**Anticipated (±SD)**	**Unanticipated (±SD)**	**P**
Inphase Prox+	1.0 ± 3.2	2.0 ± 3.8	0.192
Inphase Dist+	21.9 ± 9.9	27.2 ± 8.9	0.009
Antiphase Dist+	23.8 ± 14.7	22.3 ± 13.4	0.597
Antiphase Prox-	29.3 ± 10.5	29.2 ± 12.0	0.971
Inphase Prox-	9.3 ± 4.8	7.0 ± 3.8	0.076
Inphase Dist-	12.4 ± 8.0	8.4 ± 5.8	0.055
Antiphase Dist-	0.0 ± 0.0	0.6 ± 1.2	0.036
Antiphase Prox+	2.2 ± 2.9	3.3 ± 2.8	0.22
Hip Flexion - Knee Abduction			
Phase	**Anticipated (±SD)**	**Unanticipated (±SD)**	**P**
Inphase Prox+	7.1 ± 5.1	5.9 ±3.7	0.384
Inphase Dist+	1.2 ± 1.4	30.2 ± 6.6	0
Antiphase Dist+	3.6 ± 3.8	14.5 ± 9.8	0
Antiphase Prox-	32.2 ± 9.7	6.8 ± 6.1	0
Inphase Prox-	36.7 ± 7.7	8.3 ± 5.6	0
Inphase Dist-	2.0 ± 2.3	8.3 ± 6.6	0.002
Antiphase Dist-	4.3 ± 3.5	19.0 ± 13.7	0.001
Antiphase Prox+	12.9 ± 7.2	7.0 ± 6.7	0.016
Hip Rotation - Knee Flexion			
Phase	**Anticipated (±SD)**	**Unanticipated (±SD)**	**P**
Inphase Prox+	4.0 ± 3.4	5.9 ± 3.7	0.091
Inphase Dist+	34.7 ± 8.8	30.2 ± 6.6	0.031
Antiphase Dist+	17.0 ± 10.1	14.5 ± 9.8	0.186
Antiphase Prox-	7.7 ± 4.8	6.8 ± 6.1	0.485
Inphase Prox-	6.3 ± 4.2	8.3 ± 5.6	0.08
Inphase Dist-	4.7 ± 4.7	8.3 ± 6.6	0.059
Antiphase Dist-	18.6 ± 11.4	19.0 ± 13.7	0.855
Antiphase Prox+	7.0 ± 5.5	7.0 ± 6.7	1
Hip Rotation - Knee Abduction			
Phase	**Anticipated (±SD)**	**Unanticipated (±SD)**	**P**
Inphase Prox+	29.1 ± 13.2	26.5 ± 12.3	0.359
Inphase Dist+	8.8 ± 5.9	10.3 ± 8.5	0.454
Antiphase Dist+	8.3 ± 5.1	13.2 ± 7.5	0.012
Antiphase Prox-	15.2 ± 8.2	11.2 ± 7.5	0.029
Inphase Prox-	9.2 ± 6.9	9.7 ± 9.0	0.737
Inphase Dist-	3.2 ± 4.0	3.0 ± 3.4	0.854
Antiphase Dist-	4.6 ± 5.1	4.8 ± 4.7	0.919
Antiphase Prox+	21.5 ± 9.0	21.2 ± 9.1	0.842
Hip Rotation - Knee Rotation			
Phase	**Anticipated (±SD)**	**Unanticipated (±SD)**	**P**
Inphase Prox+	18.9 ± 9.4	18.8 ± 14.5	0.951
Inphase Dist+	15.0 ± 11.7	14.7 ± 9.0	0.892
Antiphase Dist+	5.0 ± 6.0	5.2 ± 5.3	0.787
Antiphase Prox-	6.3 ± 5.5	8.5 ± 7.0	0.182
Inphase Prox-	10.4 ± 7.0	9.8 ± 6.4	0.759
Inphase Dist-	14.1 ± 9.8	14.1 ± 8.6	1.
Antiphase Dist-	18.5 ± 9.2	14.3 ± 8.7	0.029
Antiphase Prox+	11.8 ± 8.8	14.5 ± 9.0	0.345
Hip Abduction - Knee Abduction			
Phase	**Anticipated (±SD)**	**Unanticipated (±SD)**	**P**

Inphase Prox+	15.4 ± 9.0	11.7 ± 9.1	0.054
Inphase Dist+	3.2 ± 3.5	4.4 ± 6.5	0.513
Antiphase Dist+	6.8 ± 6.2	8.4 ± 5.9	0.368
Antiphase Prox-	22.4 ± 11.3	16.8 ± 9.2	0.1
Inphase Prox-	22.5 ± 12.9	25.6 ± 9.1	0.304
Inphase Dist-	4.6 ± 5.8	6.9 ± 6.1	0.233
Antiphase Dist-	3.1 ± 3.0	5.0 ± 3.5	0.023
Antiphase Prox+	22.0 ± 11.3	21.1 ± 8.8	0.726
Knee Flexion - Knee Abduction			
Phase	**Anticipated (±SD)**	**Unanticipated (±SD)**	**P**
Inphase Prox+	17.7 ± 10.9	11.7 ± 10.8	0.017
Inphase Dist+	0.5 ± 0.9	0.4 ± 0.6	0.706
Antiphase Dist+	3.3 ± 2.5	3.0 ± 3.7	0.734
Antiphase Prox-	16.9 ± 7.1	12.6 ± 7.2	0.031
Inphase Prox-	29.7 ± 8.7	33.9 ± 8.9	0.04
Inphase Dist-	1.2 ± 2.5	2.3 ± 2.4	0.228
Antiphase Dist-	3.5 ± 3.6	5.0 ± 5.0	0.145
Antiphase Prox+	27.1 ± 12.4	31.2 ± 12.3	0.174
Knee Rotation - Knee Abduction			
Phase	**Anticipated (±SD)**	**Unanticipated (±SD)**	**P**
Inphase Prox+	15.2 ± 10.0	11.3 ± 7.8	0.064
Inphase Dist+	1.1 ± 1.5	2.2 ± 3.4	0.228
Antiphase Dist+	1.5 ± 2.4	1.8 ± 3.6	0.806
Antiphase Prox-	6.5 ± 4.4	7.2 ± 6.2	0.588
Inphase Prox-	25.0 ± 7.1	22.8 ± 10.1	0.406
Inphase Dist-	5.9 ± 5.7	9.6 ± 6.9	0.089
Antiphase Dist-	8.2 ± 6.7	13.2 ± 7.9	0.037
Antiphase Prox+	36.5 ± 10.8	31.9 ± 9.7	0.086
Knee Abduction - Ankle Inversion			
Phase	**Anticipated (±SD)**	**Unanticipated (±SD)**	**P**
Inphase Prox+	25.3 ± 8.7	21.6 ± 10.6	0.08
Inphase Dist+	5.9 ± 5.3	8.0 ± 7.2	0.135
Antiphase Dist+	5.0 ± 5.1	6.2 ± 5.3	0.355
Antiphase Prox-	16.8 ± 7.8	16.7 ± 7.9	0.982
Inphase Prox-	12.4 ± 7.8	11.5 ± 6.9	0.651
Inphase Dist-	3.0 ± 2.7	4.4 ± 3.3	0.135
Antiphase Dist-	8.9 ± 8.0	9.0 ± 7.2	0.953
Antiphase Prox+	22.8 ± 9.5	22.6 ± 10.8	0.923
Knee Flexion - Ankle Flexion			
Phase	**Anticipated (±SD)**	**Unanticipated (±SD)**	**P**
Inphase Prox+	31.4 ± 9.6	28.1 ± 10.5	0.034
Inphase Dist+	12.7 ± 8.3	15.9 ± 8.7	0.088
Antiphase Dist+	13.3 ± 3.7	14.6 ± 7.6	0.488
Antiphase Prox-	26.6 ± 7.9	25.8 ± 7.1	0.626
Inphase Prox-	3.6 ± 2.9	5.5 ± 3.3	0.044
Inphase Dist-	1.4 ± 4.1	0.7 ± 1.0	0.5
Antiphase Dist-	4.8 ± 2.6	2.7 ± 2.7	0.01
Antiphase Prox+	6.1 ± 2.9	6.7 ± 5.0	0.546
Trunk Flexion - Pelvis Tilt			
Phase	**Anticipated (±SD)**	**Unanticipated (±SD)**	**P**
Inphase Prox+	20.2 ± 17.7	29.3 ± 15.2	0.044
Inphase Dist+	2.2 ± 2.3	5.1 ± 8.1	0.117
Antiphase Dist+	2.8 ± 2.8	1.1 ± 1.2	0.018
Antiphase Prox-	10.1 ± 6.3	8.9 ± 5.3	0.445
Inphase Prox-	28.1 ± 8.7	30.0 ± 10.2	0.385
Inphase Dist-	6.7 ± 8.1	5.5 ± 7.0	0.377
Antiphase Dist-	4.5 ± 5.1	3.0 ± 4.4	0.191
Antiphase Prox+	25.4 ± 14.0	17.1 ± 14.5	0.048
Trunk Lateral Flexion - Pelvis List			

Phase	Anticipated (±SD)	Unanticipated (±SD)	P
Inphase Prox+	22.8 ± 10.7	22.5 ± 7.5	0.89
Inphase Dist+	14.0 ± 9.3	10.9 ± 6.0	0.108
Antiphase Dist+	10.2 ± 7.5	11.9 ± 11.5	0.628
Antiphase Prox-	29.5 ± 13.4	29.9 ± 18.1	0.918
Inphase Prox-	10.3 ± 7.8	5.8 ± 4.3	0.021
Inphase Dist-	6.4 ± 8.4	3.9 ± 5.0	0.196
Antiphase Dist-	1.9 ± 2.0	4.6 ± 5.7	0.054
Antiphase Prox+	5.0 ± 4.9	10.6 ± 12.5	0.019
Trunk Rotation - Pelvis Rotation			
Phase	**Anticipated (±SD)**	**Unanticipated (±SD)**	**P**
Inphase Prox+	4.9 ± 3.8	8.6 ± 6.5	0.011
Inphase Dist+	1.5 ± 2.7	3.6 ± 5.2	0.109
Antiphase Dist+	1.9 ± 3.4	2.4 ± 4.8	0.595
Antiphase Prox-	4.8 ± 7.0	3.8 ± 6.3	0.647
Inphase Prox-	11.0 ± 10.5	12.7 ± 11.0	0.457
Inphase Dist-	12.5 ± 10.3	11.6 ± 10.7	0.785
Antiphase Dist-	15.8 ± 12.5	17.3 ± 10.1	0.563
Antiphase Prox+	47.7 ± 17.2	40.0 ± 10.6	0.102