

Code ▾

# Component Developmental Sequence Analysis

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## Data Description:

Intervention and Control Cohorts across 5 timepoints. Component Developmental sequence data across 4 skills (Standing Long Jump, 1-Leg Hop, Throwing, and Kicking). Collected at 5 different timepoints.

## Created Variables across the 4 skills:

- 1. Mode for each DS component.
- 2. Component Profile for each of 5 trial.
- 3. Component Profile Mode for each of 5 timepoints.

## Analysis.

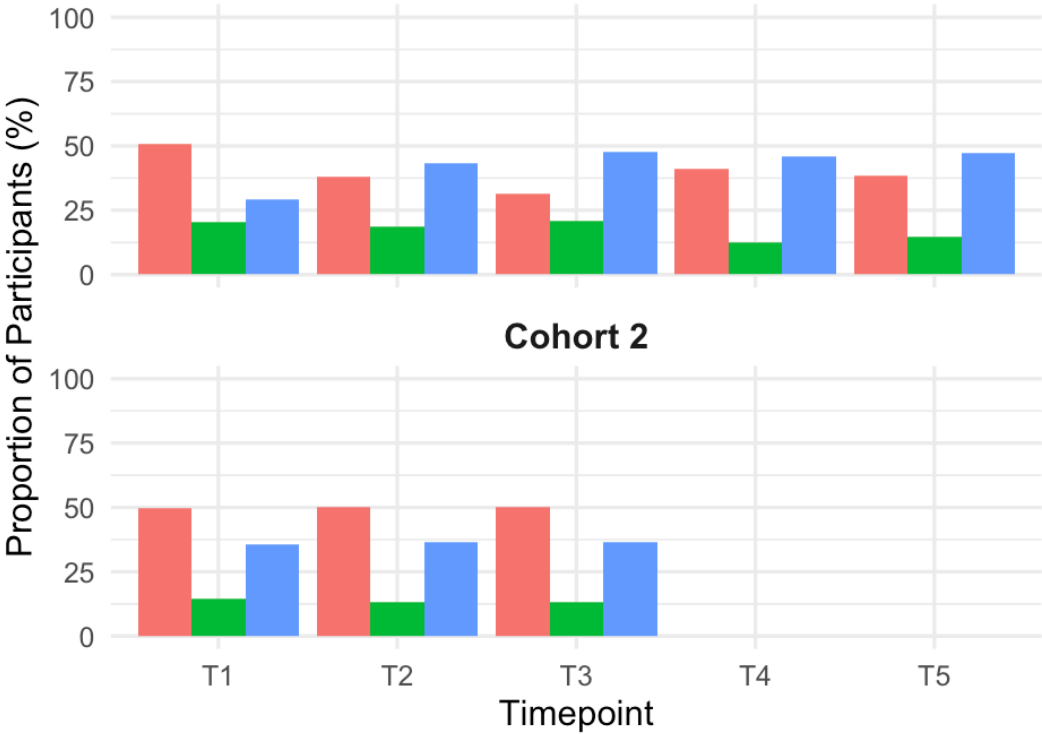
## Frequency of Each Component for each timepoint Throwing.

Step.

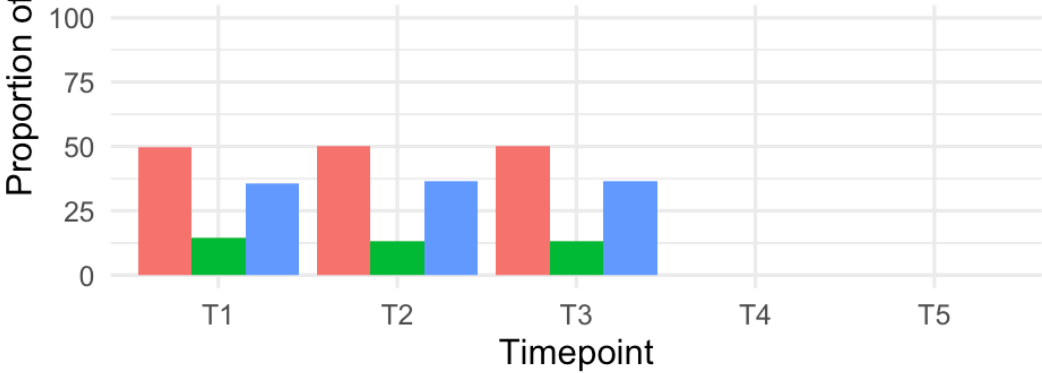
Cohort <chr>	Timepoint <chr>	1 <dbl>	2 <dbl>	3 <dbl>
C1	T1	0.5053763	0.2043011	0.2903226
C1	T2	0.3805310	0.1858407	0.4336283
C1	T3	0.3134328	0.2089552	0.4776119
C1	T4	0.4126984	0.1269841	0.4603175
C1	T5	0.3823529	0.1470588	0.4705882
C2	T1	0.4969697	0.1454545	0.3575758
C2	T2	0.5029940	0.1317365	0.3652695
C2	T3	0.5029940	0.1317365	0.3652695
8 rows				

Component Score Proportions: Throw\_Step\_Mode

Cohort 1



Cohort 2

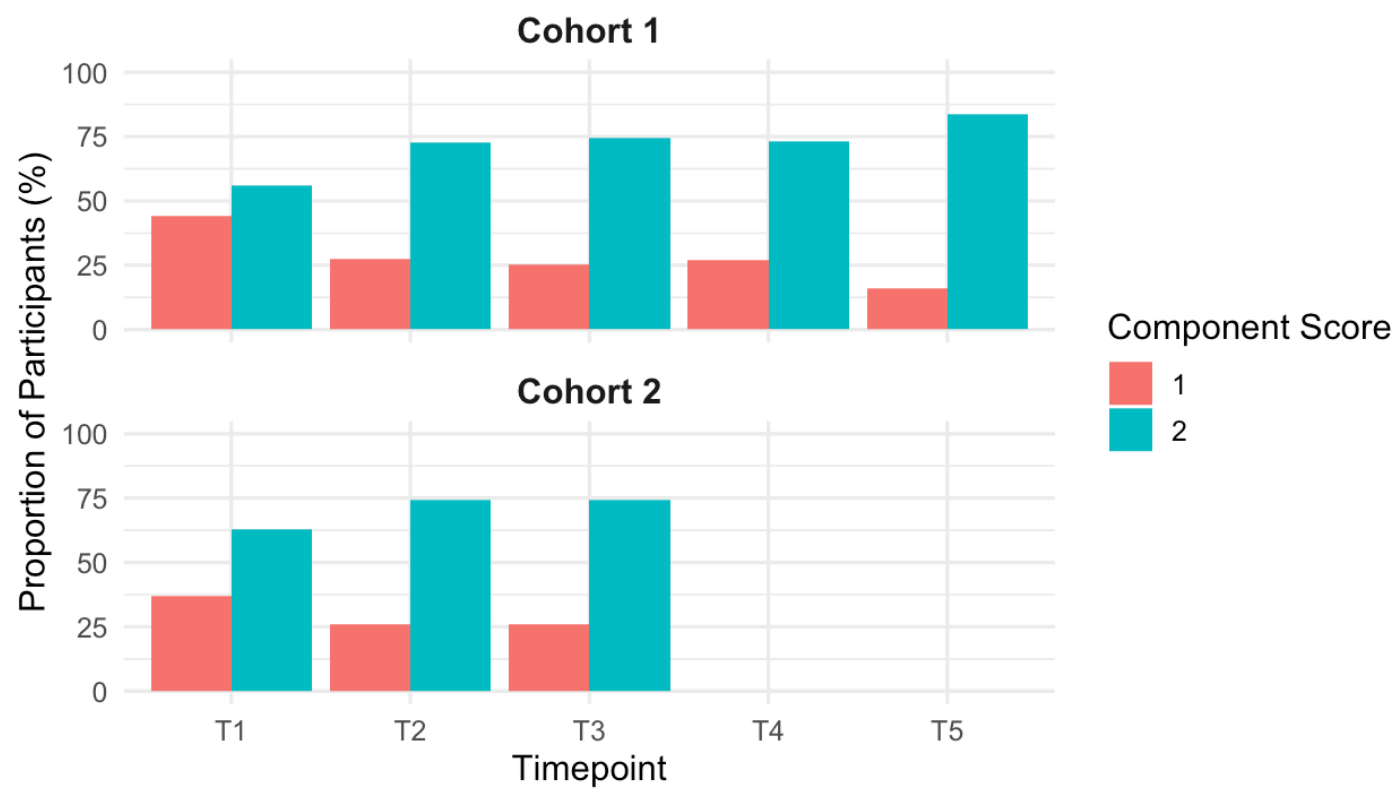


Trunk.

Cohort	Timepoint	1	2
<chr>	<chr>	<dbl>	<dbl>
C1	T1	0.4408602	0.5591398
C1	T2	0.2743363	0.7256637
C1	T3	0.2537313	0.7462687
C1	T4	0.2698413	0.7301587
C1	T5	0.1617647	0.8382353
C2	T1	0.3696970	0.6303030
C2	T2	0.2574850	0.7425150
C2	T3	0.2574850	0.7425150

8 rows

Component Score Proportions: Throw\_Trunk\_Mode

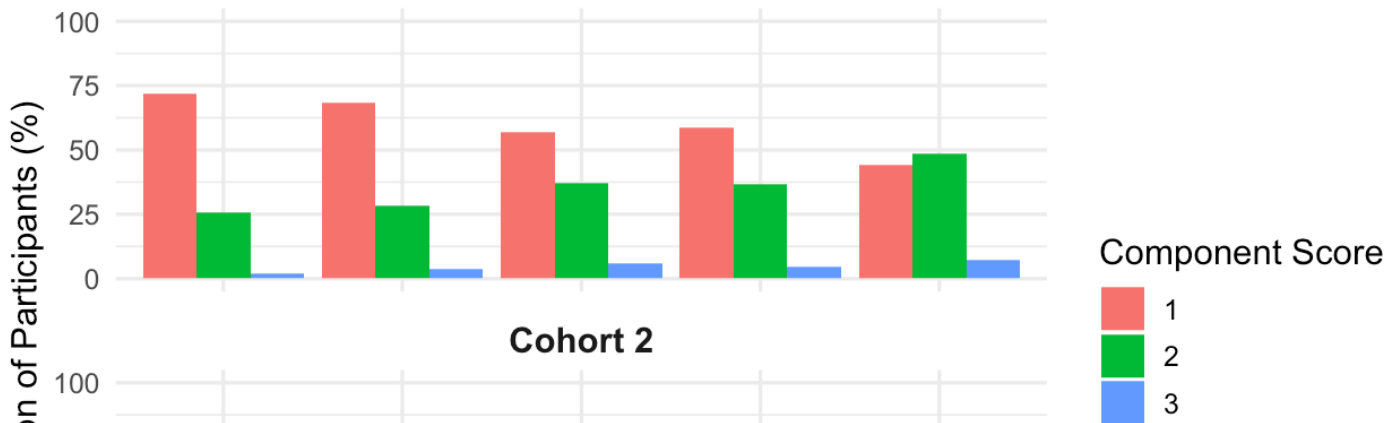


Humerus.

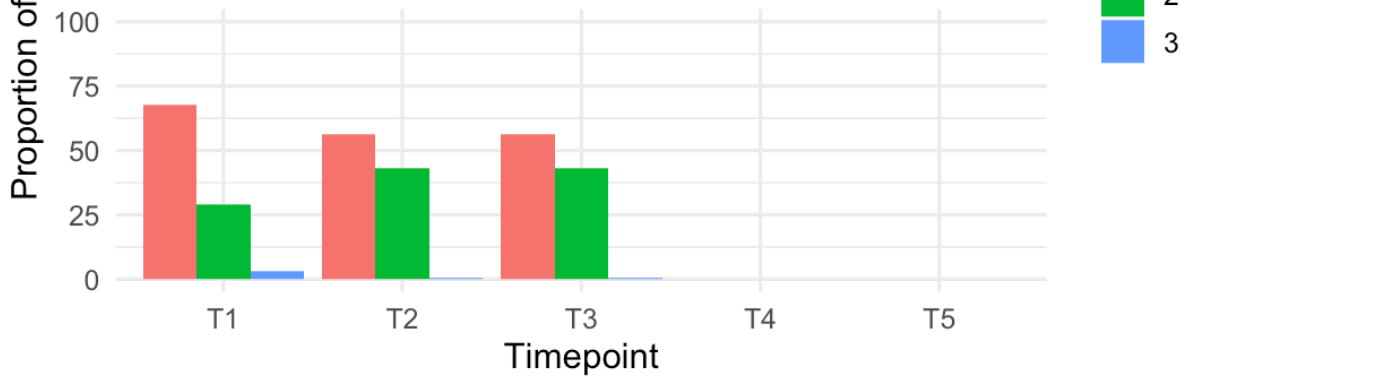
Cohort	Timepoint	1	2	3
<chr>	<chr>	<dbl>	<dbl>	<dbl>
C1	T1	0.7204301	0.2580645	0.021505376
C1	T2	0.6814159	0.2831858	0.035398230
C1	T3	0.5671642	0.3731343	0.059701493
C1	T4	0.5873016	0.3650794	0.047619048
C1	T5	0.4411765	0.4852941	0.073529412
C2	T1	0.6787879	0.2909091	0.030303030
C2	T2	0.5628743	0.4311377	0.005988024
C2	T3	0.5628743	0.4311377	0.005988024
8 rows				

Component Score Proportions: Throw\_Humerus\_Mode

Cohort 1



Cohort 2



Forearm.

Cohort	Timepoint	1	2	3
<chr>	<chr>	<dbl>	<dbl>	<dbl>
C1	T1	0.6559140	0.3440860	0.000000000
C1	T2	0.6106195	0.3805310	0.008849558
C1	T3	0.4179104	0.5671642	0.014925373
C1	T4	0.4444444	0.5555556	0.000000000
C1	T5	0.2941176	0.6911765	0.014705882
C2	T1	0.5272727	0.4666667	0.006060606
C2	T2	0.4730539	0.5269461	0.000000000
C2	T3	0.4730539	0.5269461	0.000000000

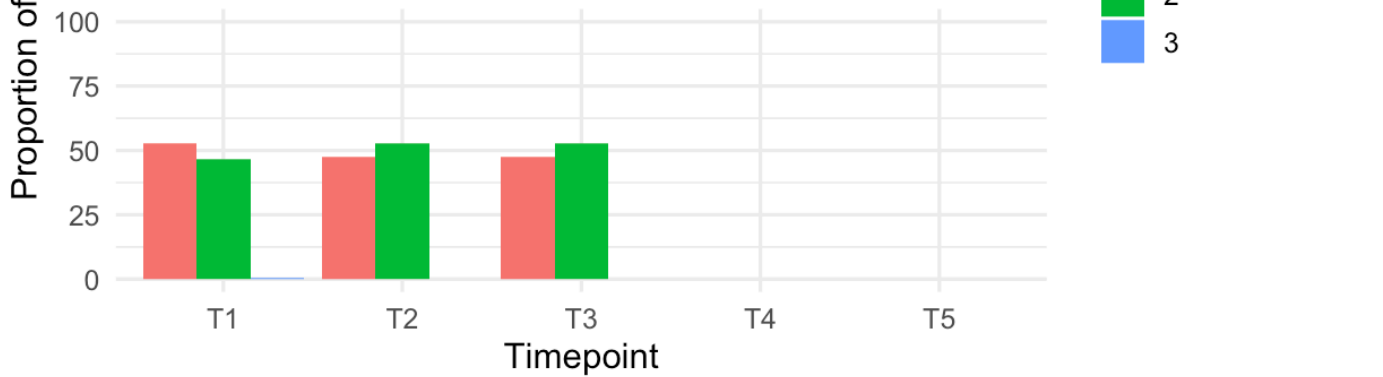
8 rows

Component Score Proportions: Throw\_Forearm\_Mode

Cohort 1



Cohort 2



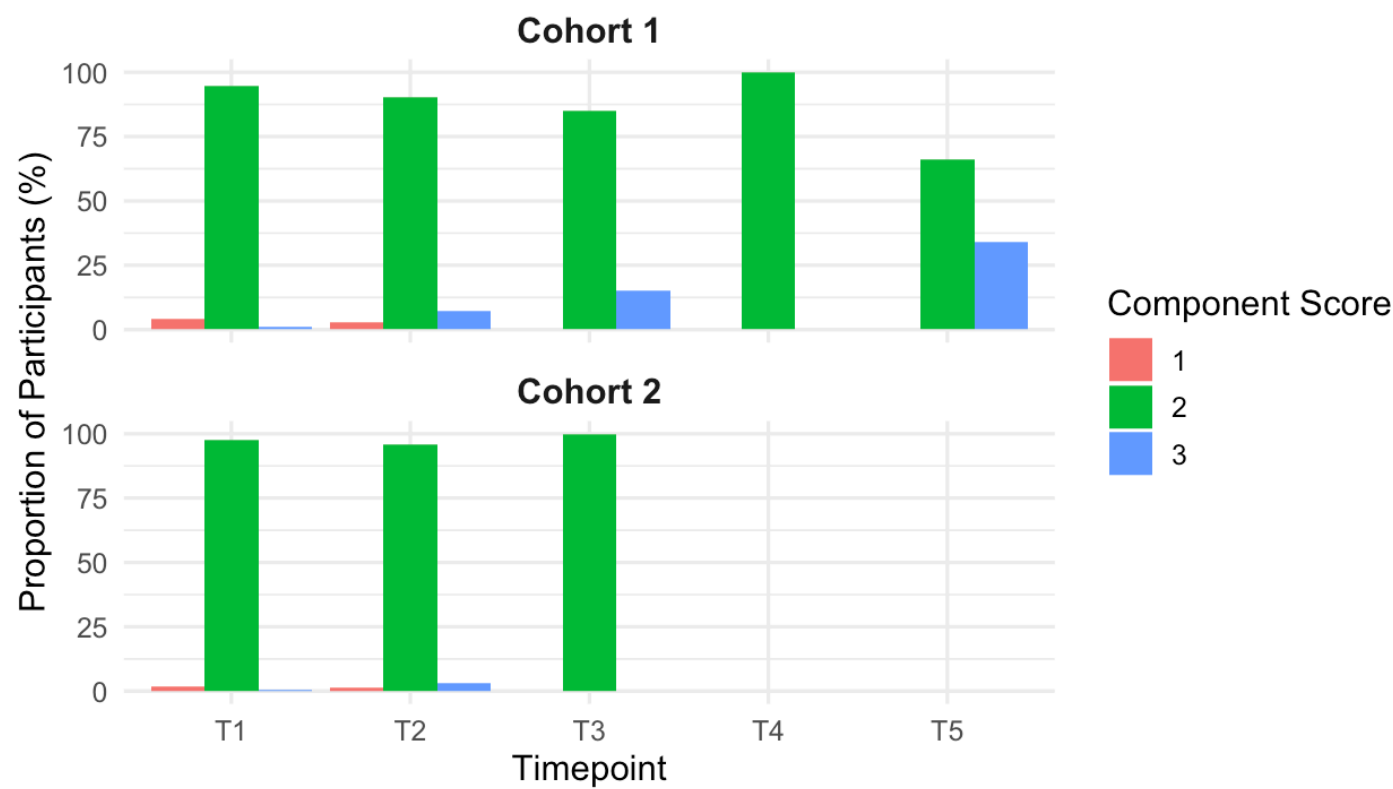
Kicking

Approach.

Cohort	Timepoint	1	2	3
<chr>	<chr>	<dbl>	<dbl>	<dbl>
C1	T1	0.04123711	0.9484536	0.010309278
C1	T2	0.02631579	0.9035088	0.070175439
C1	T3	0.00000000	0.8507463	0.149253731
C1	T4	0.00000000	1.0000000	0.000000000
C1	T5	0.00000000	0.6617647	0.338235294
C2	T1	0.01764706	0.9764706	0.005882353
C2	T2	0.01204819	0.9578313	0.030120482
C2	T3	0.00000000	1.0000000	0.000000000

8 rows

Component Score Proportions: Kick\_Approach\_Mode

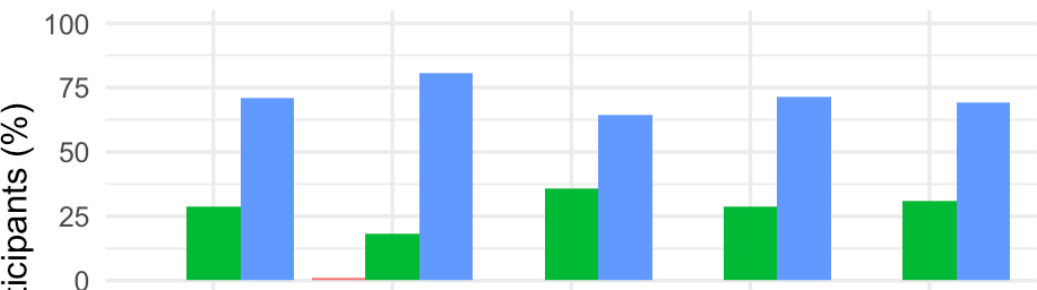


Support Location.

Cohort <chr>	Timepoint <chr>	2 <dbl>	3 <dbl>	1 <dbl>
C1	T1	0.2886598	0.7113402	0.000000000
C1	T2	0.1842105	0.8070175	0.008771930
C1	T3	0.3582090	0.6417910	0.000000000
C1	T4	0.2857143	0.7142857	0.000000000
C1	T5	0.3088235	0.6911765	0.000000000
C2	T1	0.2470588	0.7470588	0.005882353
C2	T2	0.2409639	0.7530120	0.006024096
C2	T3	0.2307692	0.7692308	0.000000000
8 rows				

Component Score Proportions: Kick\_Support.Loc\_Mode

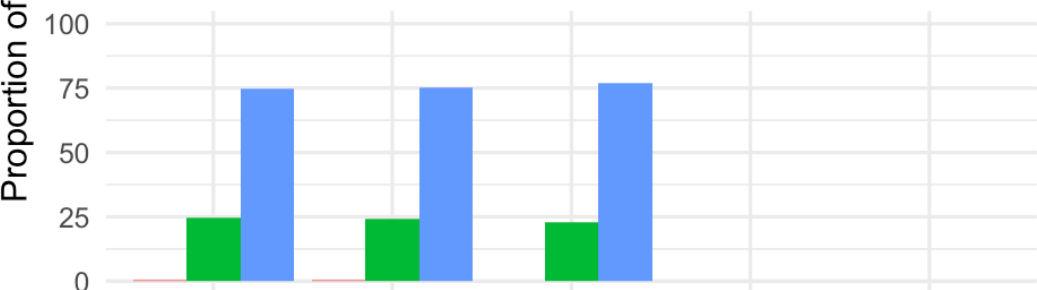
Cohort 1



Component Score



Cohort 2



Timepoint

Knee Action.

Cohort <chr>	Timepoint <chr>	2 <dbl>	3 <dbl>	1 <dbl>
C1	T1	0.9278351	0.07216495	0.000000000
C1	T2	0.9561404	0.02631579	0.017543860
C1	T3	0.9850746	0.01492537	0.000000000
C1	T4	0.9523810	0.04761905	0.000000000
C1	T5	0.9411765	0.05882353	0.000000000
C2	T1	0.9705882	0.01176471	0.017647059
C2	T2	0.9819277	0.01204819	0.006024096
C2	T3	0.9230769	0.07692308	0.000000000
8 rows				

Component Score Proportions: Kick\_Knee.Action\_Mode

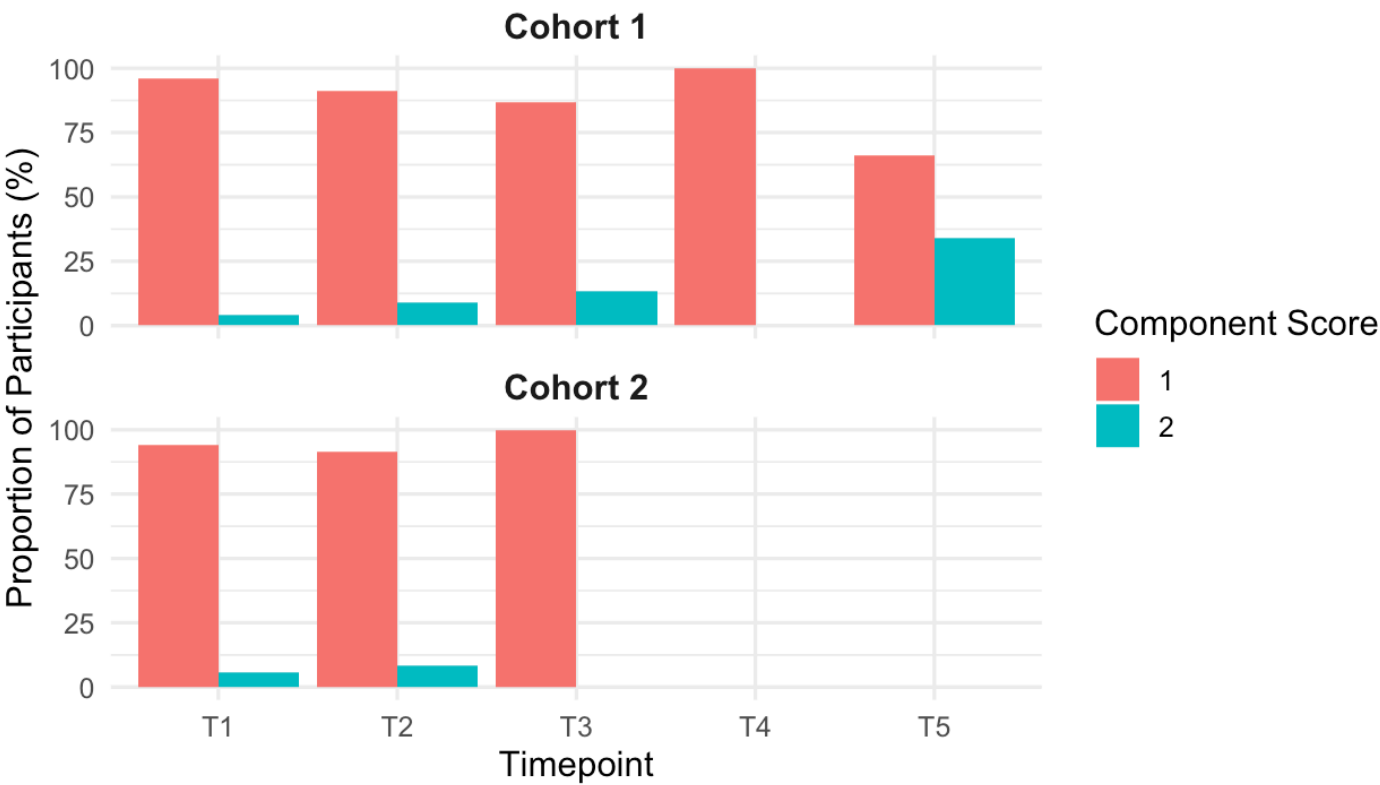


Trunk Action.

Cohort	Timepoint	1	2
<chr>	<chr>	<dbl>	<dbl>
C1	T1	0.9587629	0.04123711
C1	T2	0.9122807	0.08771930
C1	T3	0.8656716	0.13432836
C1	T4	1.0000000	0.00000000
C1	T5	0.6617647	0.33823529
C2	T1	0.9411765	0.05882353
C2	T2	0.9156627	0.08433735
C2	T3	1.0000000	0.00000000
8 rows			



Component Score Proportions: Kick\_Trunk.Action\_Mode

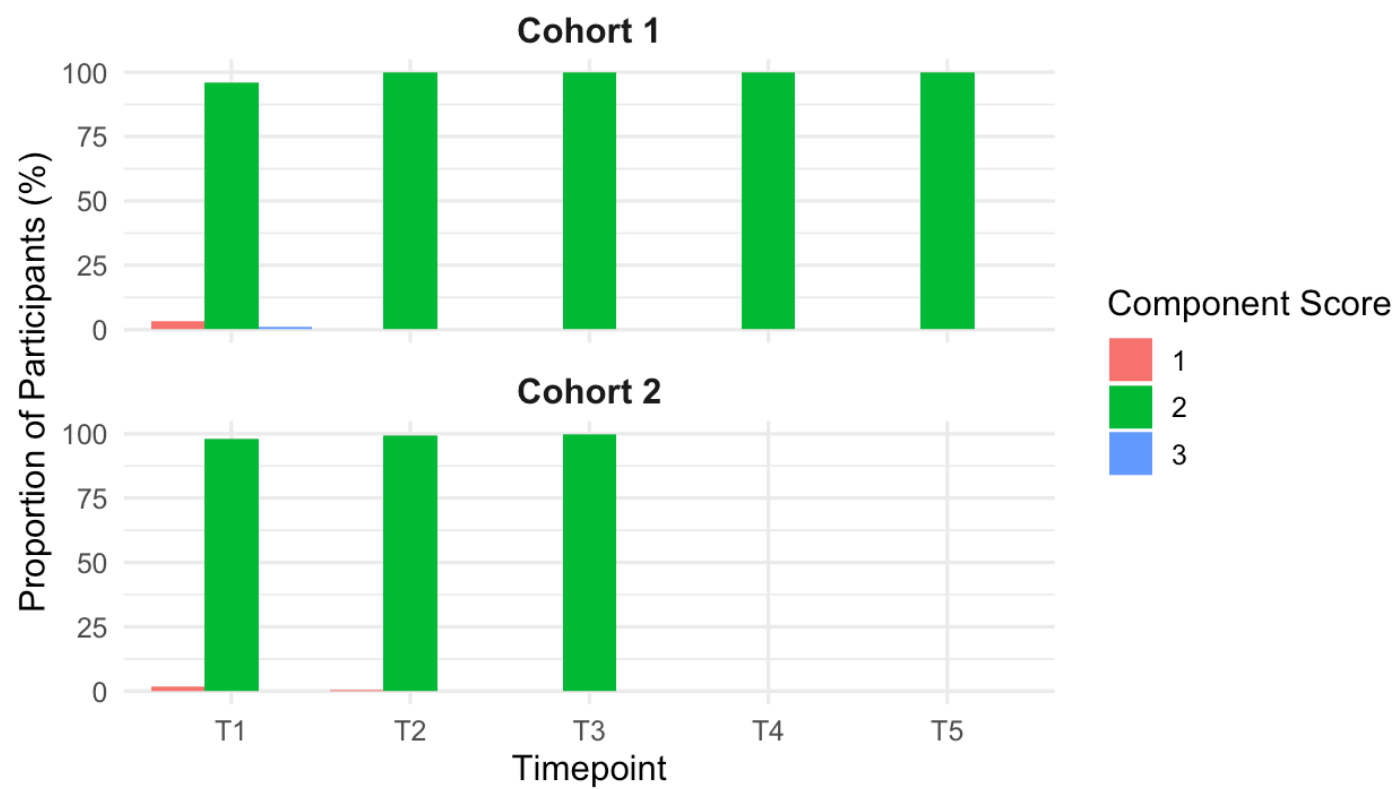


Arm Action.

Cohort	Timepoint	1	2	3
<chr>	<chr>	<dbl>	<dbl>	<dbl>
C1	T1	0.030927835	0.9587629	0.01030928
C1	T2	0.000000000	1.0000000	0.000000000
C1	T3	0.000000000	1.0000000	0.000000000
C1	T4	0.000000000	1.0000000	0.000000000
C1	T5	0.000000000	1.0000000	0.000000000
C2	T1	0.017647059	0.9823529	0.000000000
C2	T2	0.006024096	0.9939759	0.000000000
C2	T3	0.000000000	1.0000000	0.000000000

8 rows

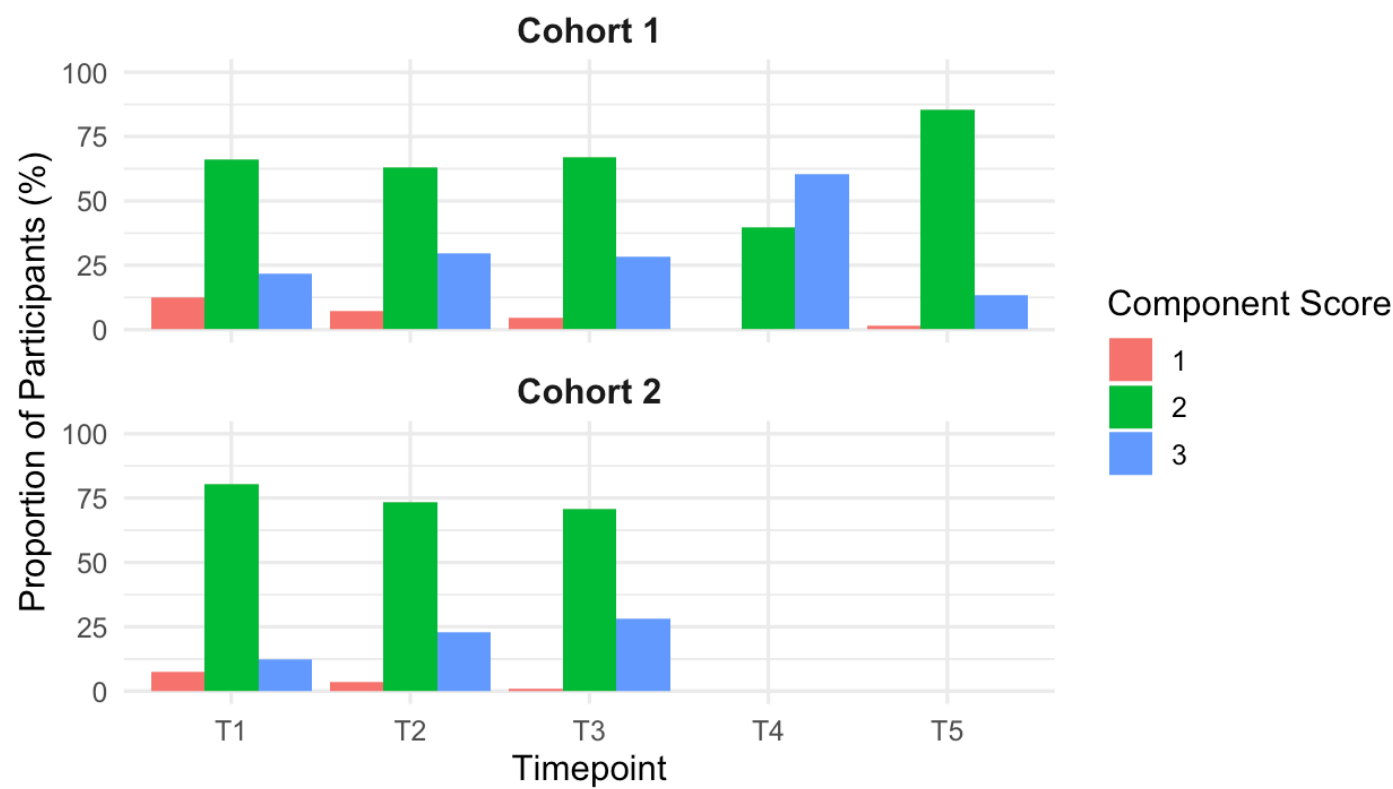
Component Score Proportions: Kick\_Arm.Action\_Mode



Follow Through.

Cohort	Timepoint	1	2	3
<chr>	<chr>	<dbl>	<dbl>	<dbl>
C1	T1	0.123711340	0.6597938	0.2164948
C1	T2	0.070175439	0.6315789	0.2982456
C1	T3	0.044776119	0.6716418	0.2835821
C1	T4	0.000000000	0.3968254	0.6031746
C1	T5	0.014705882	0.8529412	0.1323529
C2	T1	0.073619632	0.8036810	0.1226994
C2	T2	0.036144578	0.7349398	0.2289157
C2	T3	0.008547009	0.7094017	0.2820513
8 rows				

Component Score Proportions: Kick\_Follow.Through\_Mode

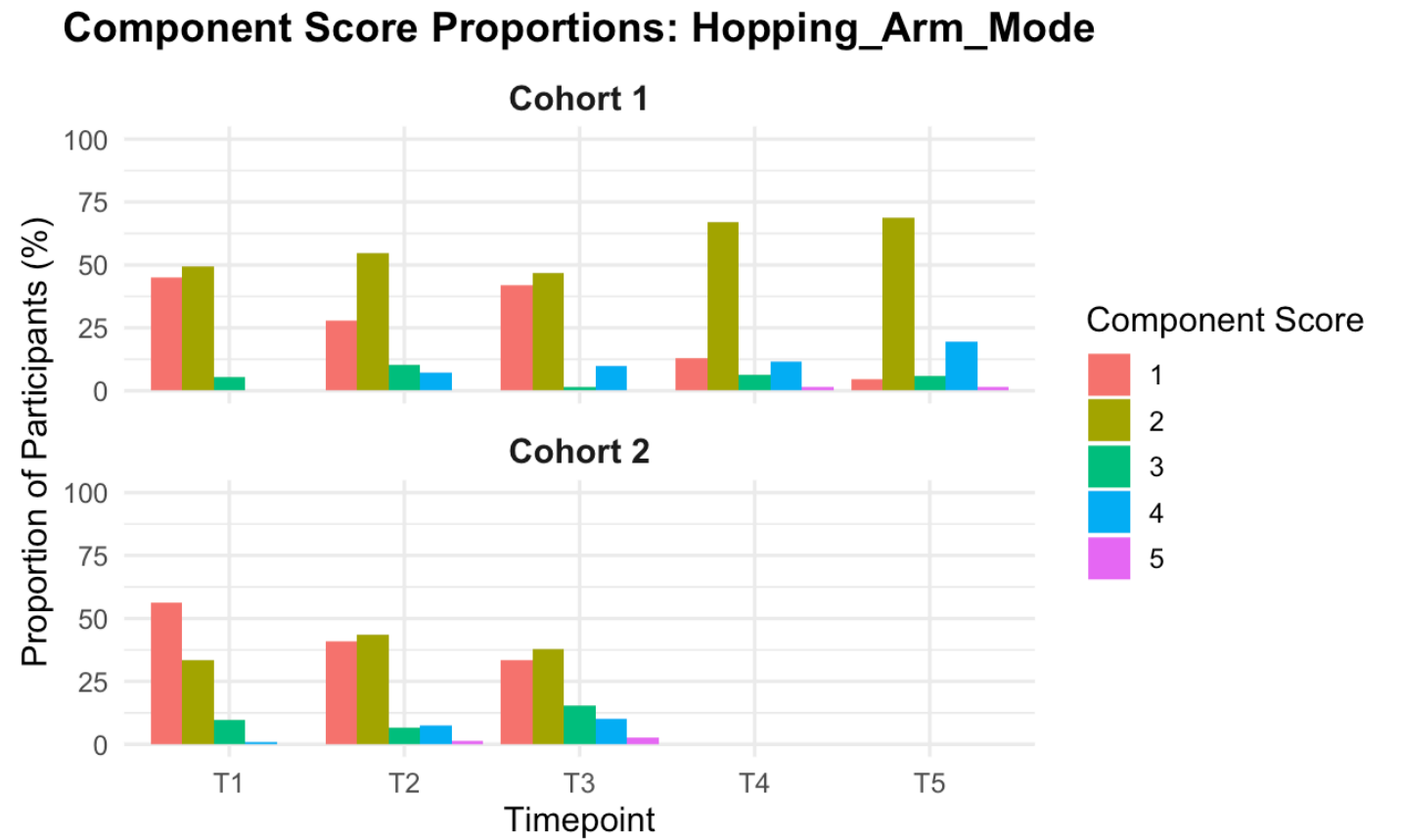


Hopping.

Arm Action.

Cohort	Timepoint	1	2	3	4	5
<chr>	<chr>	<dbl>	<dbl>	<dbl>	<dbl>	<dbl>
C1	T1	0.45054945	0.4945055	0.05494505	0.000000000	0.00000000
C1	T2	0.27777778	0.5462963	0.10185185	0.074074074	0.00000000
C1	T3	0.41935484	0.4677419	0.01612903	0.096774194	0.00000000
C1	T4	0.13114754	0.6721311	0.06557377	0.114754098	0.01639344
C1	T5	0.04477612	0.6865672	0.05970149	0.194029851	0.01492537
C2	T1	0.56296296	0.3333333	0.09629630	0.007407407	0.00000000
C2	T2	0.41059603	0.4370861	0.06622517	0.072847682	0.01324503
C2	T3	0.33620690	0.3793103	0.15517241	0.103448276	0.02586207

8 rows

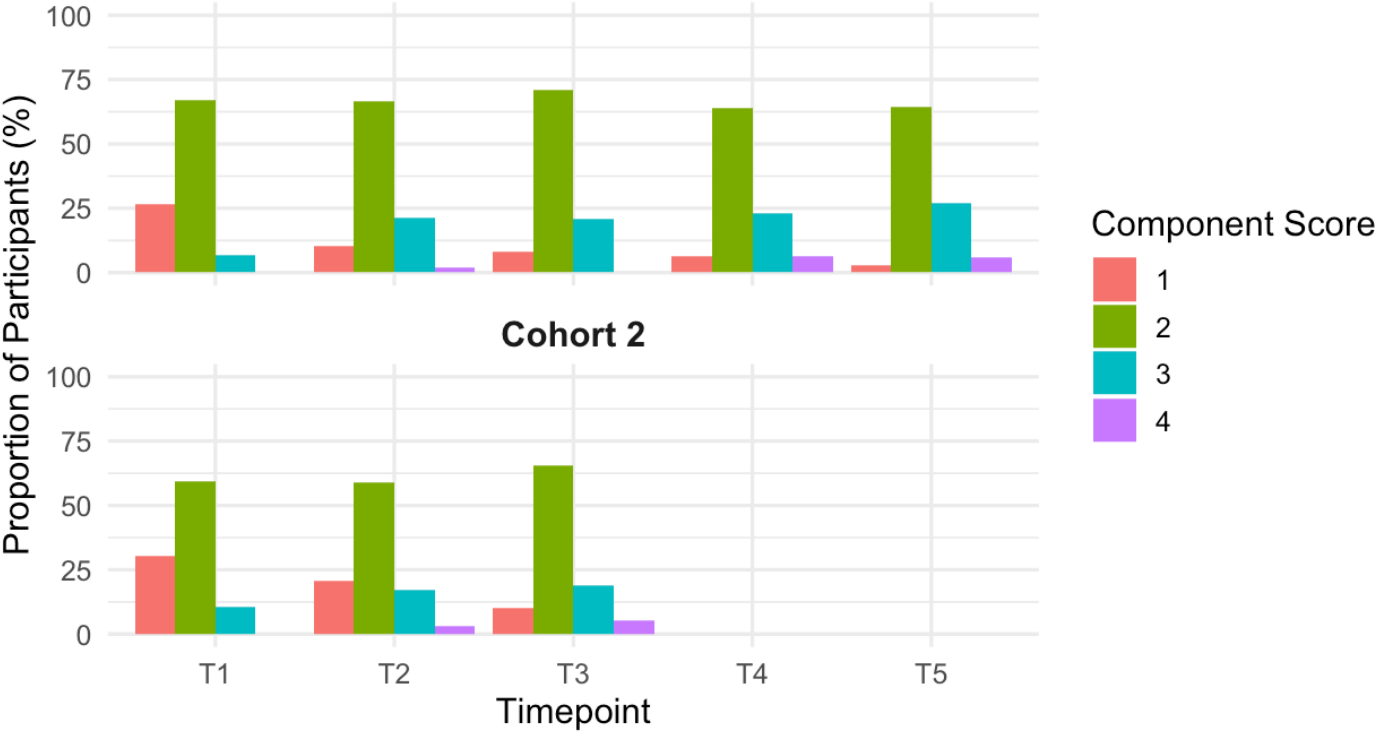


Leg Action.

Cohort	Timepoint	1	2	3	4
<chr>	<chr>	<dbl>	<dbl>	<dbl>	<dbl>
C1	T1	0.26373626	0.6703297	0.06593407	0.00000000
C1	T2	0.10185185	0.6666667	0.21296296	0.01851852
C1	T3	0.08064516	0.7096774	0.20967742	0.00000000
C1	T4	0.06557377	0.6393443	0.22950820	0.06557377
C1	T5	0.02985075	0.6417910	0.26865672	0.05970149
C2	T1	0.30370370	0.5925926	0.10370370	0.00000000
C2	T2	0.20529801	0.5894040	0.17218543	0.03311258
C2	T3	0.10344828	0.6551724	0.18965517	0.05172414
8 rows					

Component Score Proportions: Hopping\_Leg\_Mode

Cohort 1



Jumping.

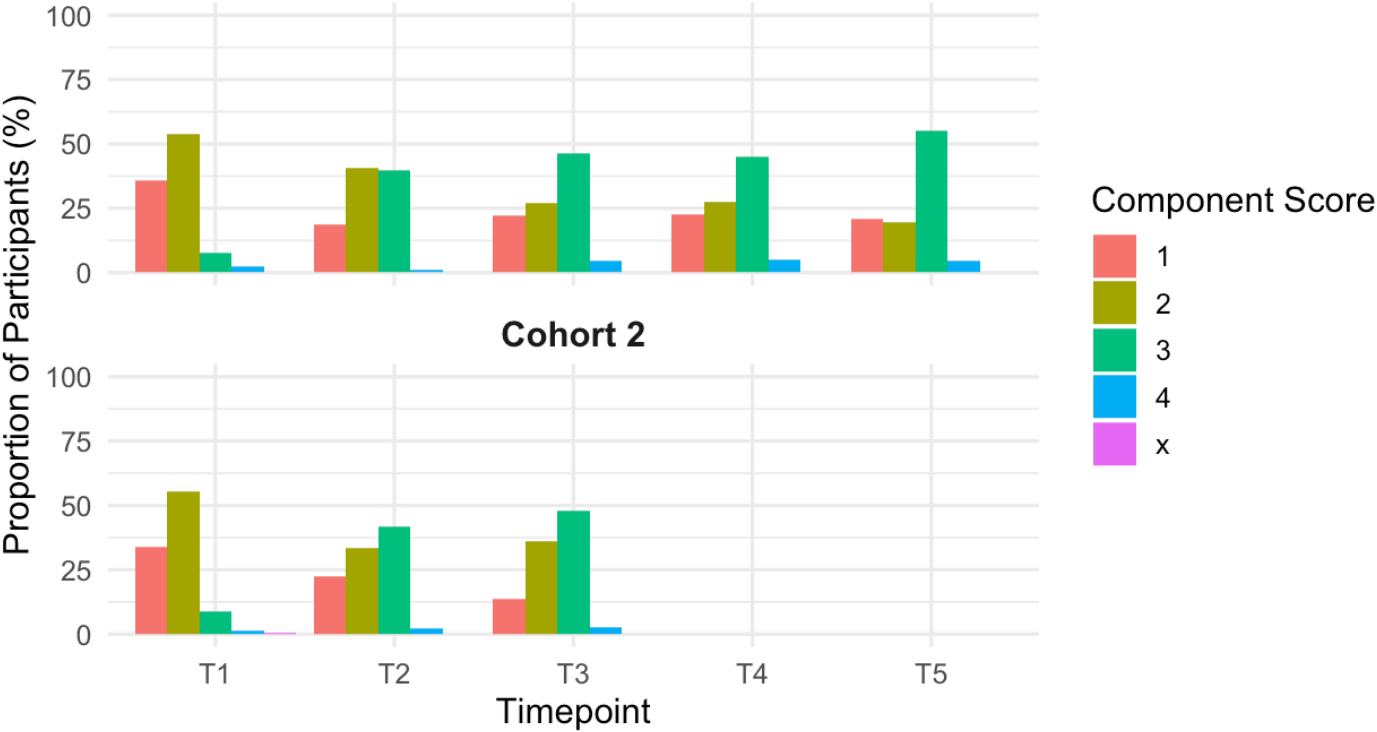
Takeoff - Arm.

Cohort	Timepoint	1	2	3	4	x
<chr>	<chr>	<dbl>	<dbl>	<dbl>	<dbl>	<dbl>
C1	T1	0.3589744	0.5384615	0.07692308	0.025641026	0.00000000
C1	T2	0.1858407	0.4070796	0.39823009	0.008849558	0.00000000
C1	T3	0.2238806	0.2686567	0.46268657	0.044776119	0.00000000
C1	T4	0.2258065	0.2741935	0.45161290	0.048387097	0.00000000
C1	T5	0.2089552	0.1940299	0.55223881	0.044776119	0.00000000
C2	T1	0.3395062	0.5555556	0.08641975	0.012345679	0.00617284
C2	T2	0.2261905	0.3333333	0.41666667	0.023809524	0.00000000
C2	T3	0.1367521	0.3589744	0.47863248	0.025641026	0.00000000

8 rows

Component Score Proportions: Jump\_TO\_Arm\_Mode

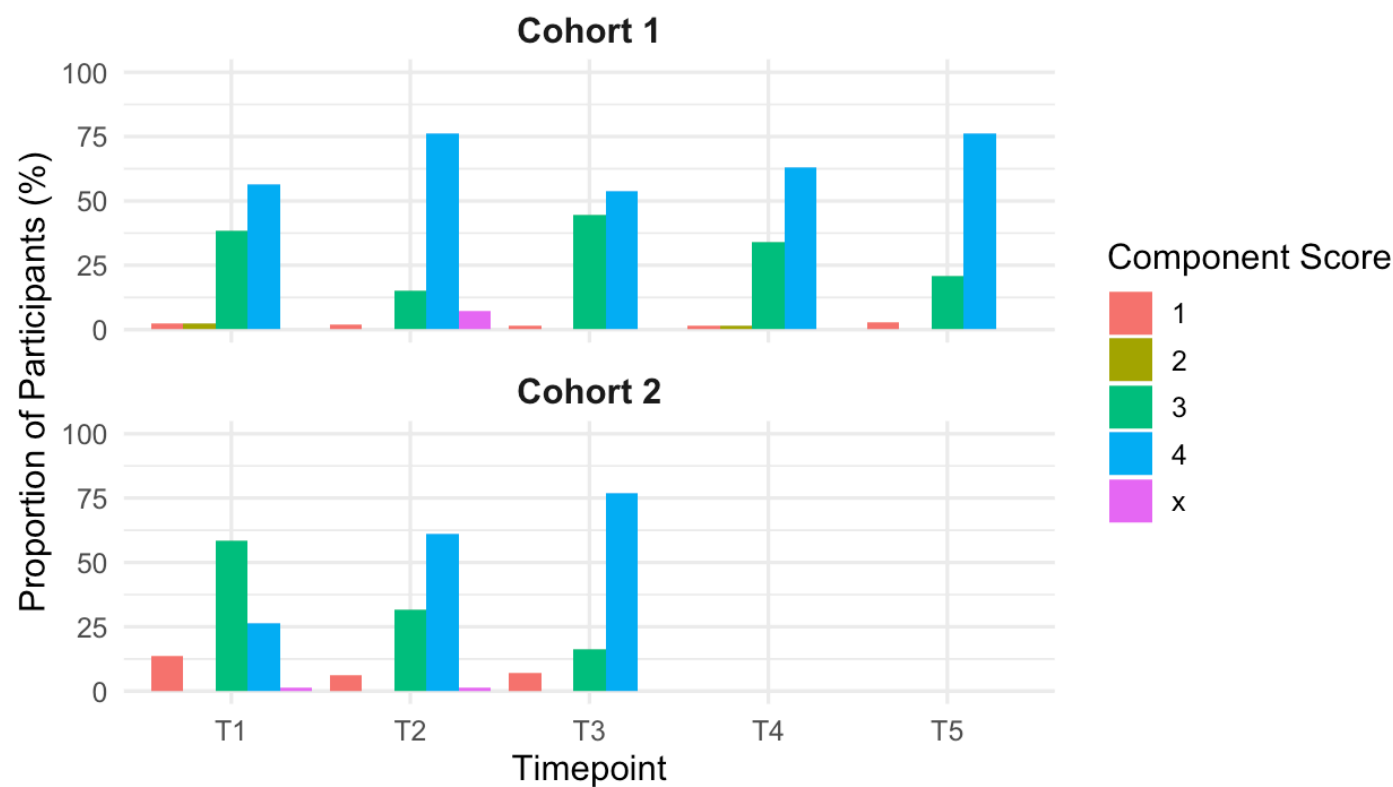
Cohort 1



Takeoff - Leg.

Cohort	Timepoint	1	2	3	4	x
<chr>	<chr>	<dbl>	<dbl>	<dbl>	<dbl>	<dbl>
C1	T1	0.02564103	0.02564103	0.3846154	0.5641026	0.00000000
C1	T2	0.01769912	0.00000000	0.1504425	0.7610619	0.07079646
C1	T3	0.01492537	0.00000000	0.4477612	0.5373134	0.00000000
C1	T4	0.01612903	0.01612903	0.3387097	0.6290323	0.00000000
C1	T5	0.02985075	0.00000000	0.2089552	0.7611940	0.00000000
C2	T1	0.13580247	0.00000000	0.5864198	0.2654321	0.01234568
C2	T2	0.05952381	0.00000000	0.3154762	0.6130952	0.01190476
C2	T3	0.06837607	0.00000000	0.1623932	0.7692308	0.00000000
8 rows						

Component Score Proportions: Jump\_TO\_Leg\_Mode

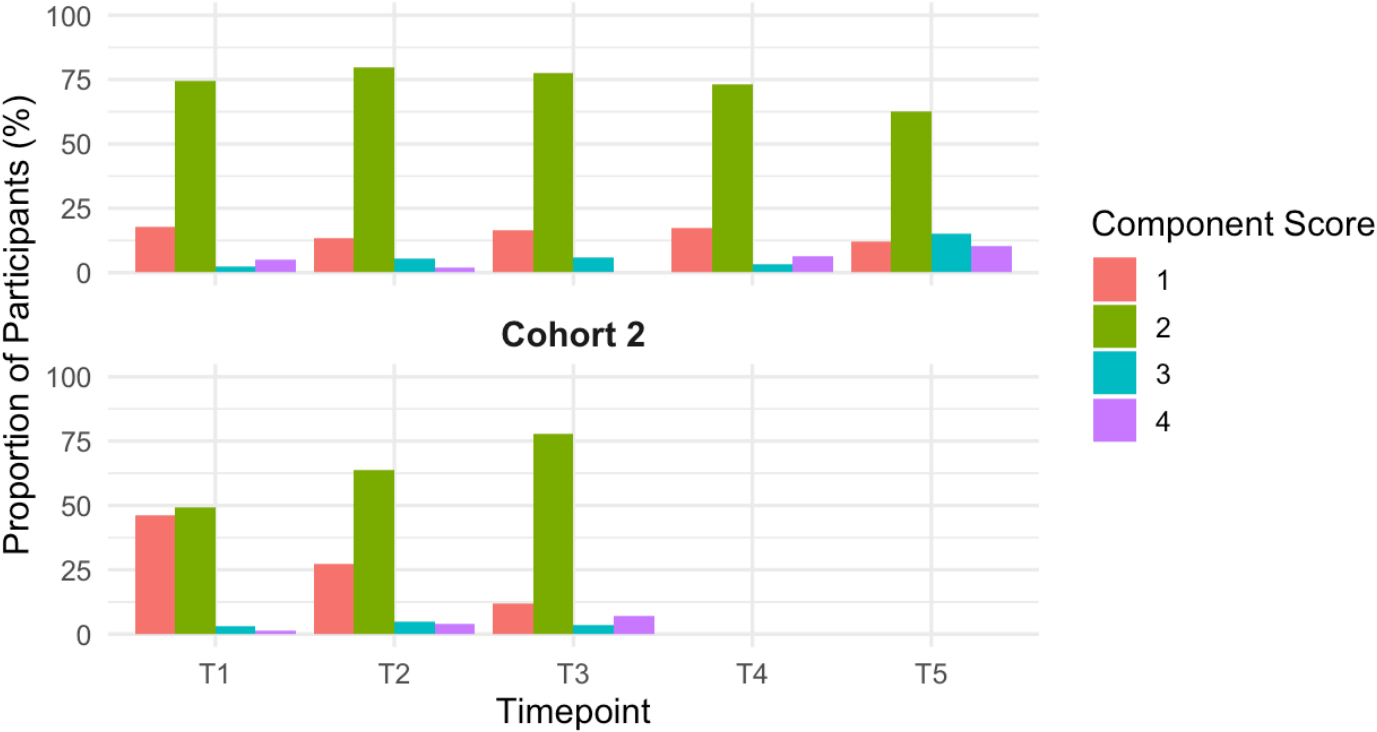


Landing - Arm.

Cohort	Timepoint	1	2	3	4
<chr>	<chr>	<dbl>	<dbl>	<dbl>	<dbl>
C1	T1	0.1794872	0.7435897	0.02564103	0.05128205
C1	T2	0.1327434	0.7964602	0.05309735	0.01769912
C1	T3	0.1641791	0.7761194	0.05970149	0.00000000
C1	T4	0.1746032	0.7301587	0.03174603	0.06349206
C1	T5	0.1194030	0.6268657	0.14925373	0.10447761
C2	T1	0.4629630	0.4938272	0.03086420	0.01234568
C2	T2	0.2738095	0.6369048	0.04761905	0.04166667
C2	T3	0.1196581	0.7777778	0.03418803	0.06837607
8 rows					

Component Score Proportions: Jump\_LND\_Arm\_Mode

Cohort 1



Landing - Foot.

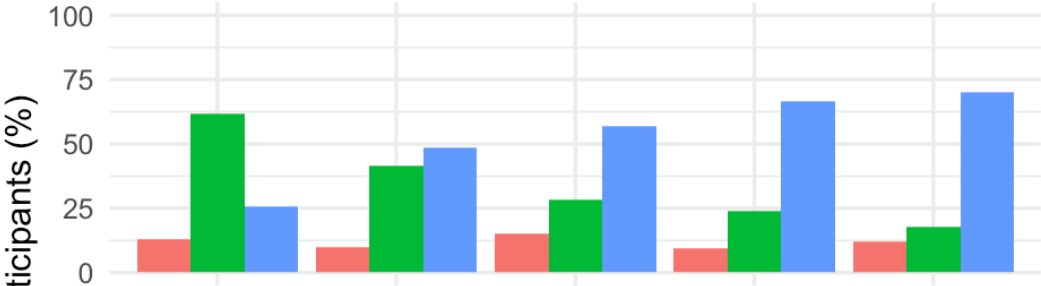
Cohort	Timepoint	1	2	3
<chr>	<chr>	<dbl>	<dbl>	<dbl>
C1	T1	0.12820513	0.6153846	0.2564103
C1	T2	0.09734513	0.4159292	0.4867257
C1	T3	0.14925373	0.2835821	0.5671642
C1	T4	0.09523810	0.2380952	0.6666667
C1	T5	0.11940299	0.1791045	0.7014925
C2	T1	0.25308642	0.4629630	0.2839506
C2	T2	0.14880952	0.2857143	0.5654762
C2	T3	0.11965812	0.3162393	0.5641026

8 rows

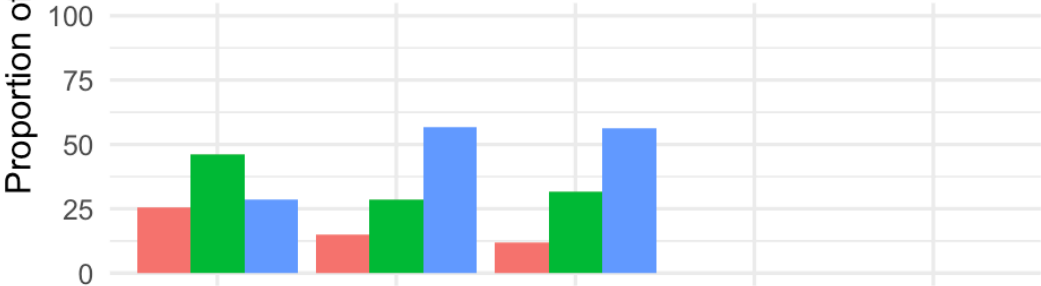


Component Score Proportions: Jump\_LND\_Foot\_Mode

Cohort 1



Cohort 2



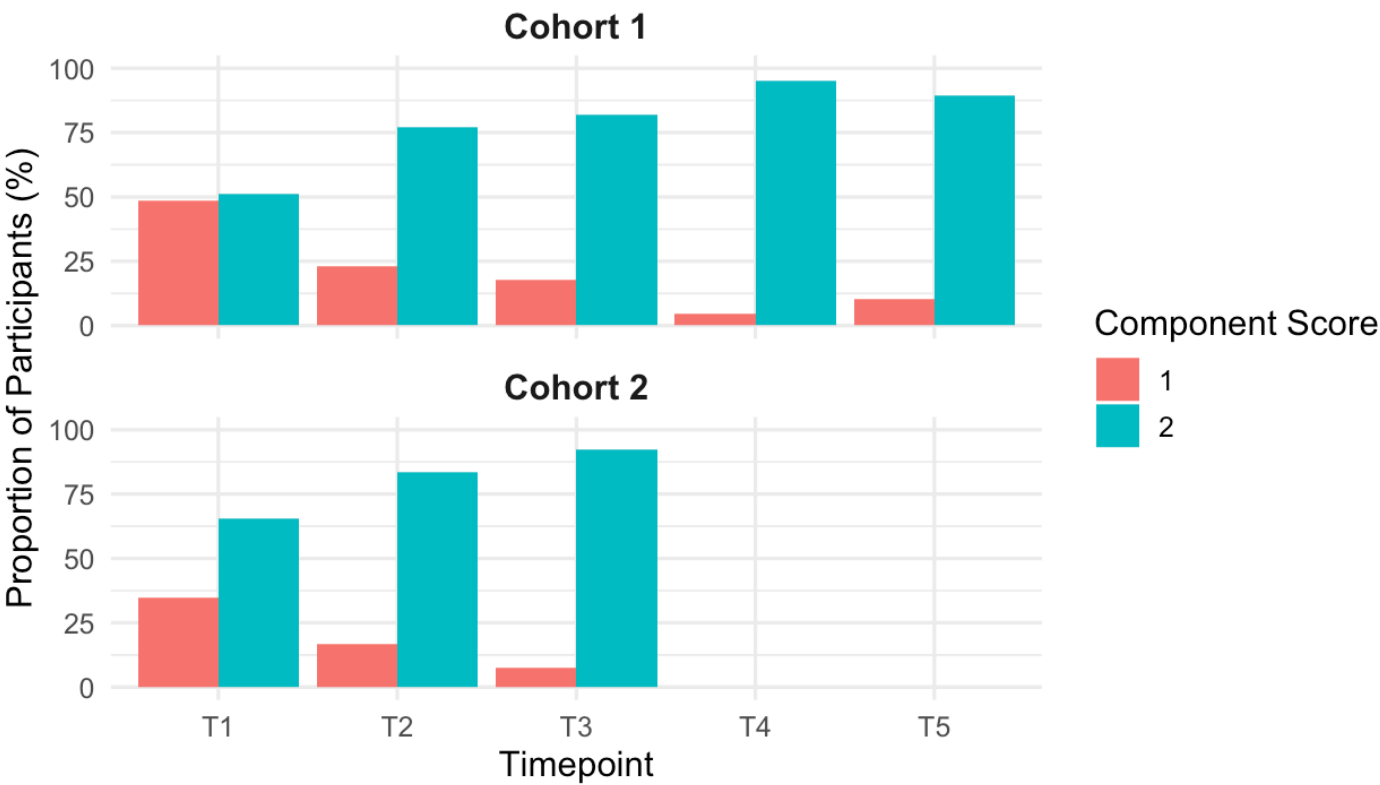
Component Score



Landing - Shank.

Cohort	Timepoint	1	2
<chr>	<chr>	<dbl>	<dbl>
C1	T1	0.48717949	0.5128205
C1	T2	0.23008850	0.7699115
C1	T3	0.17910448	0.8208955
C1	T4	0.04761905	0.9523810
C1	T5	0.10447761	0.8955224
C2	T1	0.34567901	0.6543210
C2	T2	0.16666667	0.8333333
C2	T3	0.07692308	0.9230769
8 rows			

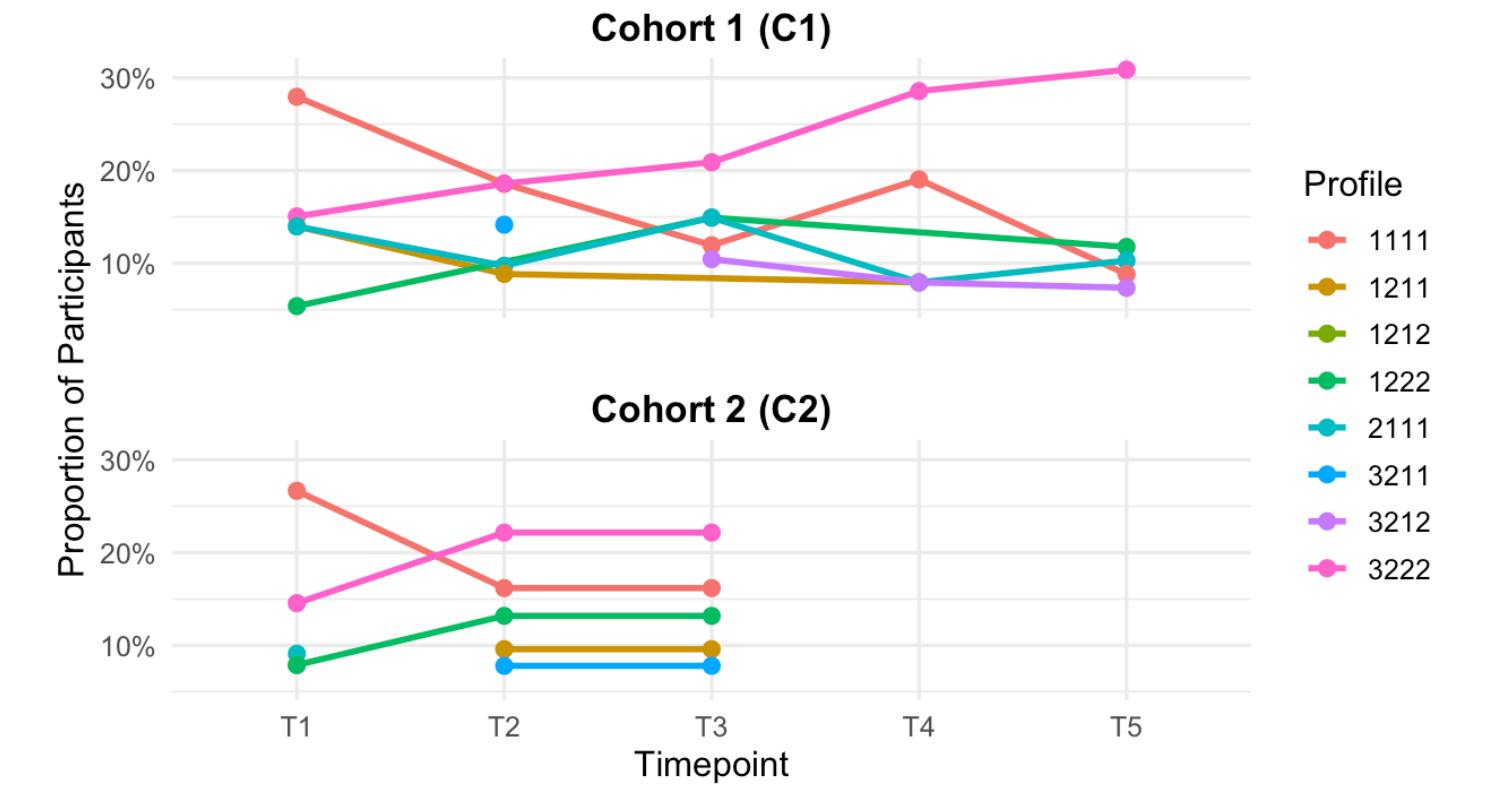
Component Score Proportions: Jump\_LND\_Shank\_Mode



Frequency and Proportion of Profile Modes at different timepoints

Try at a Figure to illustrate

Top 5 Modal Profiles Over Time: Throw Profile Mode



**Note:** Throwing profile components are ordered as: Step, Trunk, Humerus, Forearm.

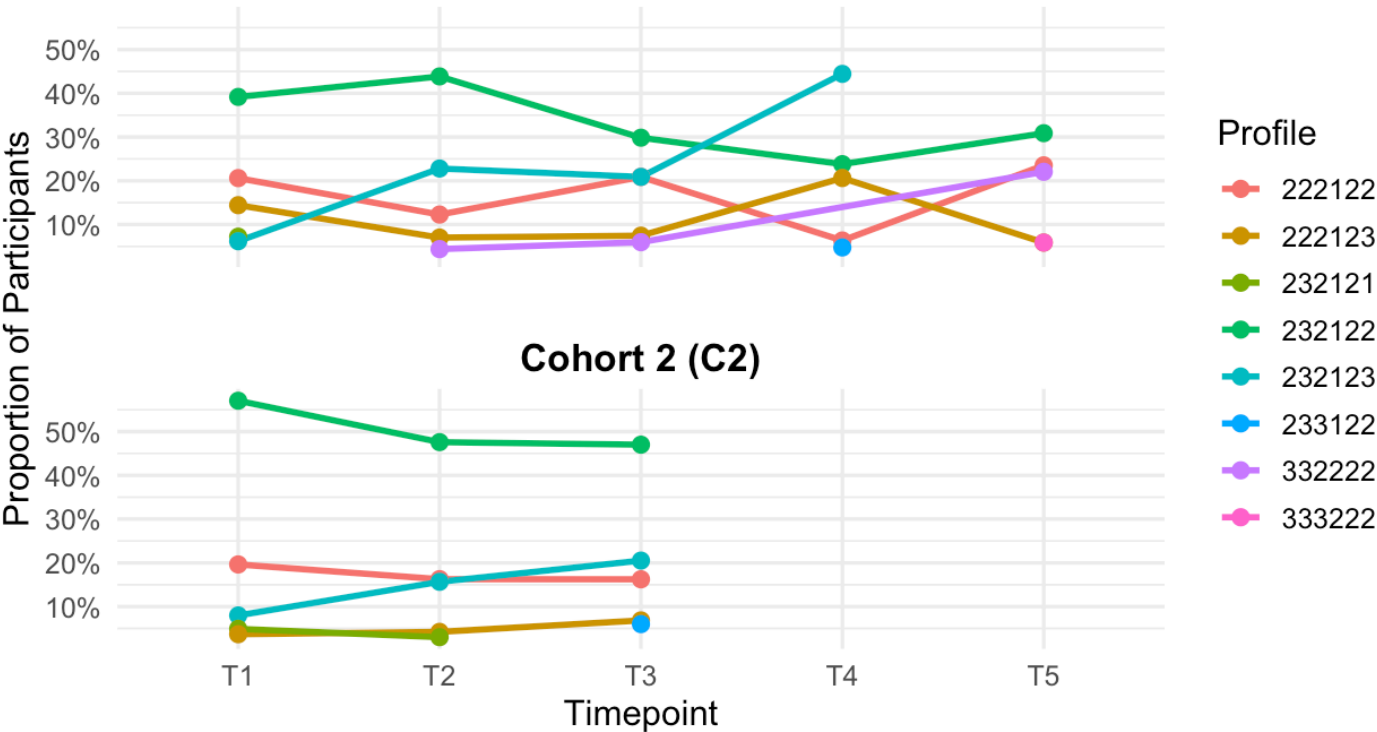
Coh...	Timepoint	1111	3222	1211	2111	1222	3211	
<chr>	<chr>	<dbl>	<dbl>	<dbl>	<dbl>	<dbl>	<dbl>	
C1	T1	0.27956989	0.1505376	0.13978495	0.13978495	0.05376344	0.00000000	0.00
C1	T2	0.18584071	0.1858407	0.08849558	0.09734513	0.00000000	0.14159292	0.00
C1	T3	0.11940299	0.2089552	0.00000000	0.14925373	0.14925373	0.00000000	0.10
C1	T4	0.19047619	0.2857143	0.07936508	0.07936508	0.00000000	0.00000000	0.07
C1	T5	0.08823529	0.3088235	0.00000000	0.10294118	0.11764706	0.00000000	0.07
C2	T1	0.26666667	0.1454545	0.00000000	0.09090909	0.07878788	0.00000000	0.00
C2	T2	0.16167665	0.2215569	0.09580838	0.00000000	0.13173653	0.07784431	0.00
C2	T3	0.16167665	0.2215569	0.09580838	0.00000000	0.13173653	0.07784431	0.00

8 rows | 1-9 of 10 columns

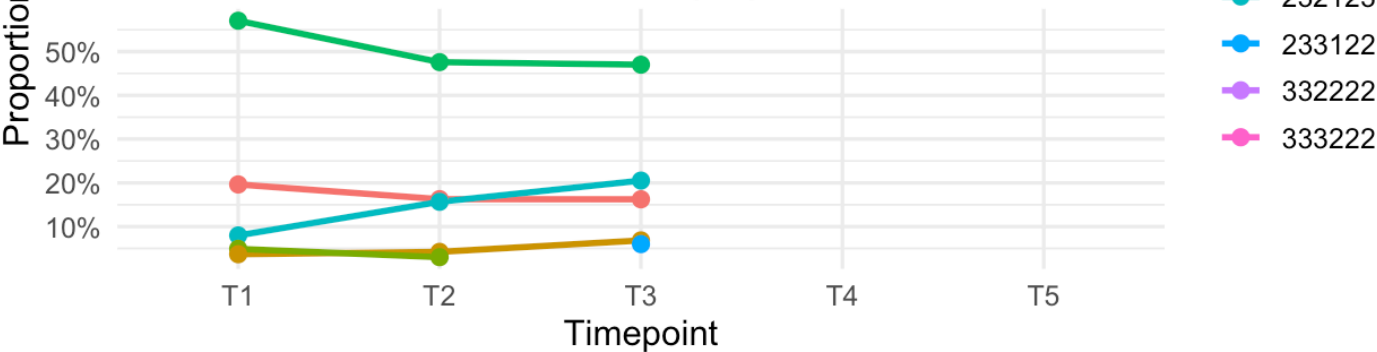
**Note:** Throwing profile components are ordered as: Step, Trunk, Humerus, Forearm.

Top 5 Modal Profiles Over Time: Kick Profile Mode

Cohort 1 (C1)



Cohort 2 (C2)



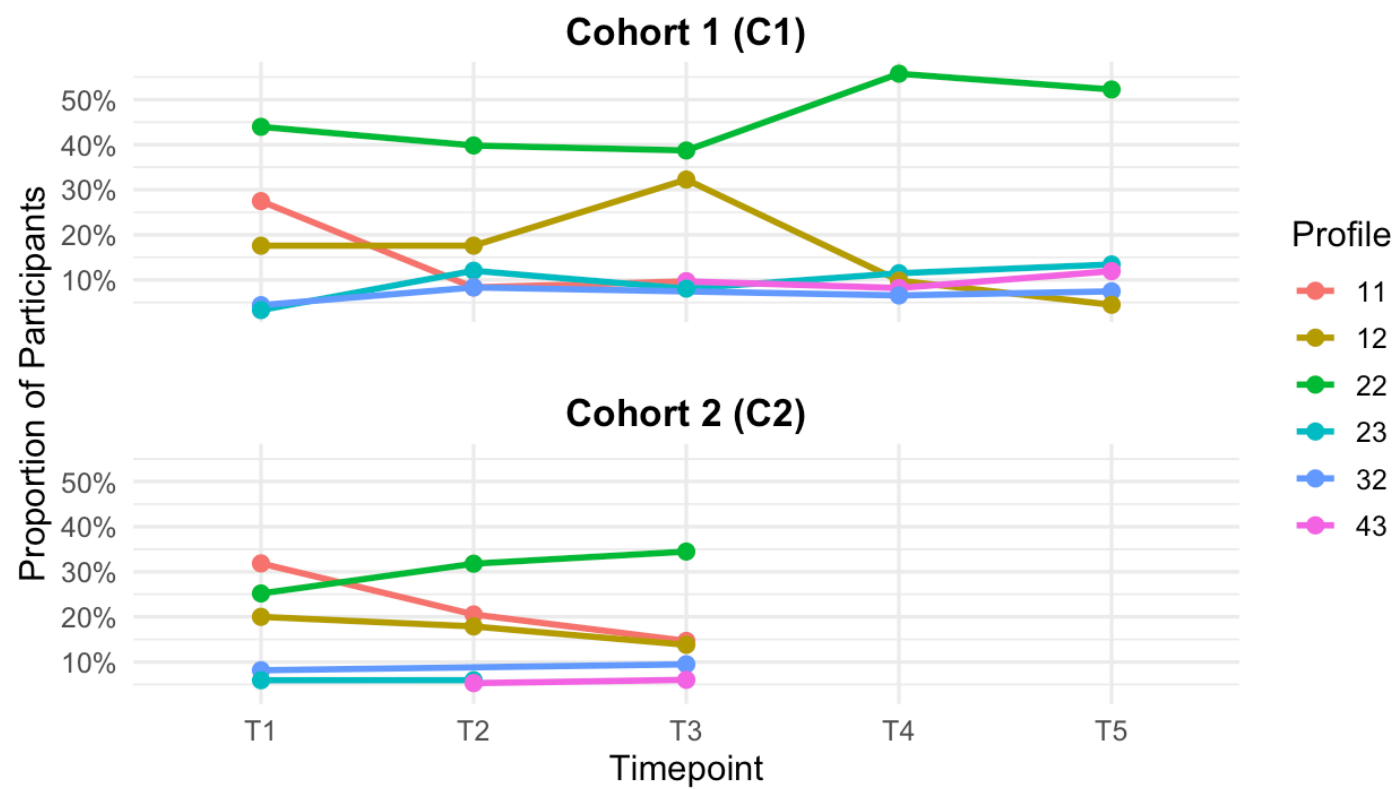
**Note:** Kicking profile components are ordered as: Approach, Support Leg, Knee Action, Trunk Action, Arm Action, Follow Through.

Coh...	Timepoint	232122	222122	222123	232121	232123	332222	
<chr>	<chr>	<dbl>	<dbl>	<dbl>	<dbl>	<dbl>	<dbl>	
C1	T1	0.3917526	0.20618557	0.14432990	0.07216495	0.06185567	0.00000000	0.00
C1	T2	0.4385965	0.12280702	0.07017544	0.00000000	0.22807018	0.04385965	0.00
C1	T3	0.2985075	0.20895522	0.07462687	0.00000000	0.20895522	0.05970149	0.00
C1	T4	0.2380952	0.06349206	0.20634921	0.00000000	0.44444444	0.00000000	0.04
C1	T5	0.3088235	0.23529412	0.05882353	0.00000000	0.00000000	0.22058824	0.00
C2	T1	0.5705521	0.19631902	0.03680982	0.04907975	0.07975460	0.00000000	0.00
C2	T2	0.4759036	0.16265060	0.04216867	0.03012048	0.15662651	0.00000000	0.00
C2	T3	0.4700855	0.16239316	0.06837607	0.00000000	0.20512821	0.00000000	0.05

8 rows | 1-9 of 10 columns

**Note:** Kicking profile components are ordered as: Approach, Support Leg, Knee Action, Trunk Action, Arm Action, Follow Through.

Top 5 Modal Profiles Over Time: Hopping Profile Mode



**Note:** Hopping profile components are ordered as: Arm, Leg.

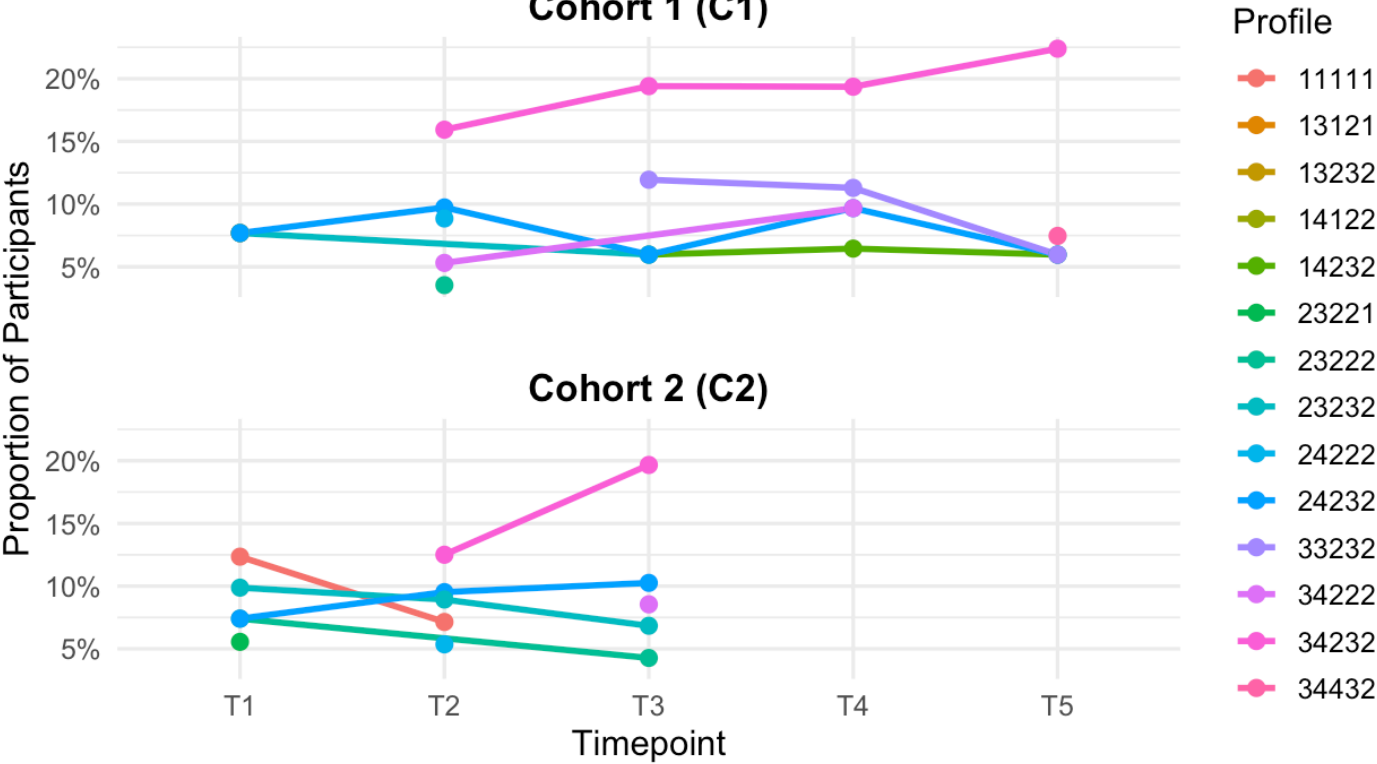
Cohort	Timepoint	22	11	12	32	23	43
<chr>	<chr>	<dbl>	<dbl>	<dbl>	<dbl>	<dbl>	<dbl>
C1	T1	0.4395604	0.27472527	0.17582418	0.04395604	0.03296703	0.00000000
C1	T2	0.3981481	0.08333333	0.17592593	0.08333333	0.12037037	0.00000000
C1	T3	0.3870968	0.09677419	0.32258065	0.00000000	0.08064516	0.09677419
C1	T4	0.5573770	0.00000000	0.09836066	0.06557377	0.11475410	0.08196721
C1	T5	0.5223881	0.00000000	0.04477612	0.07462687	0.13432836	0.11940299
C2	T1	0.2518519	0.31851852	0.20000000	0.08148148	0.05925926	0.00000000
C2	T2	0.3178808	0.20529801	0.17880795	0.00000000	0.05960265	0.05298013
C2	T3	0.3448276	0.14655172	0.13793103	0.09482759	0.00000000	0.06034483

8 rows

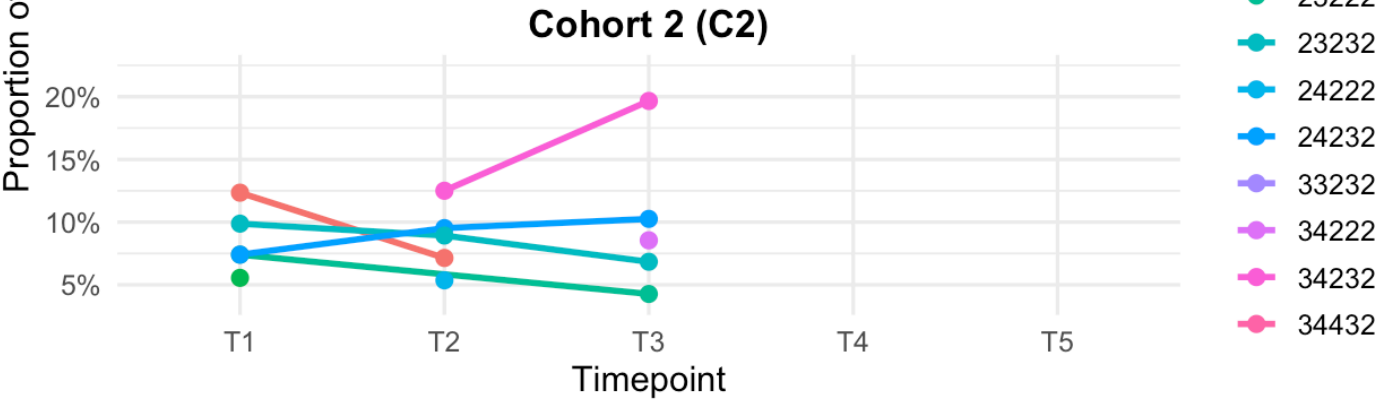
**Note:** Hopping profile components are ordered as: Arm, Leg.

Top 5 Modal Profiles Over Time: Jump Profile Mode

Cohort 1 (C1)



Cohort 2 (C2)



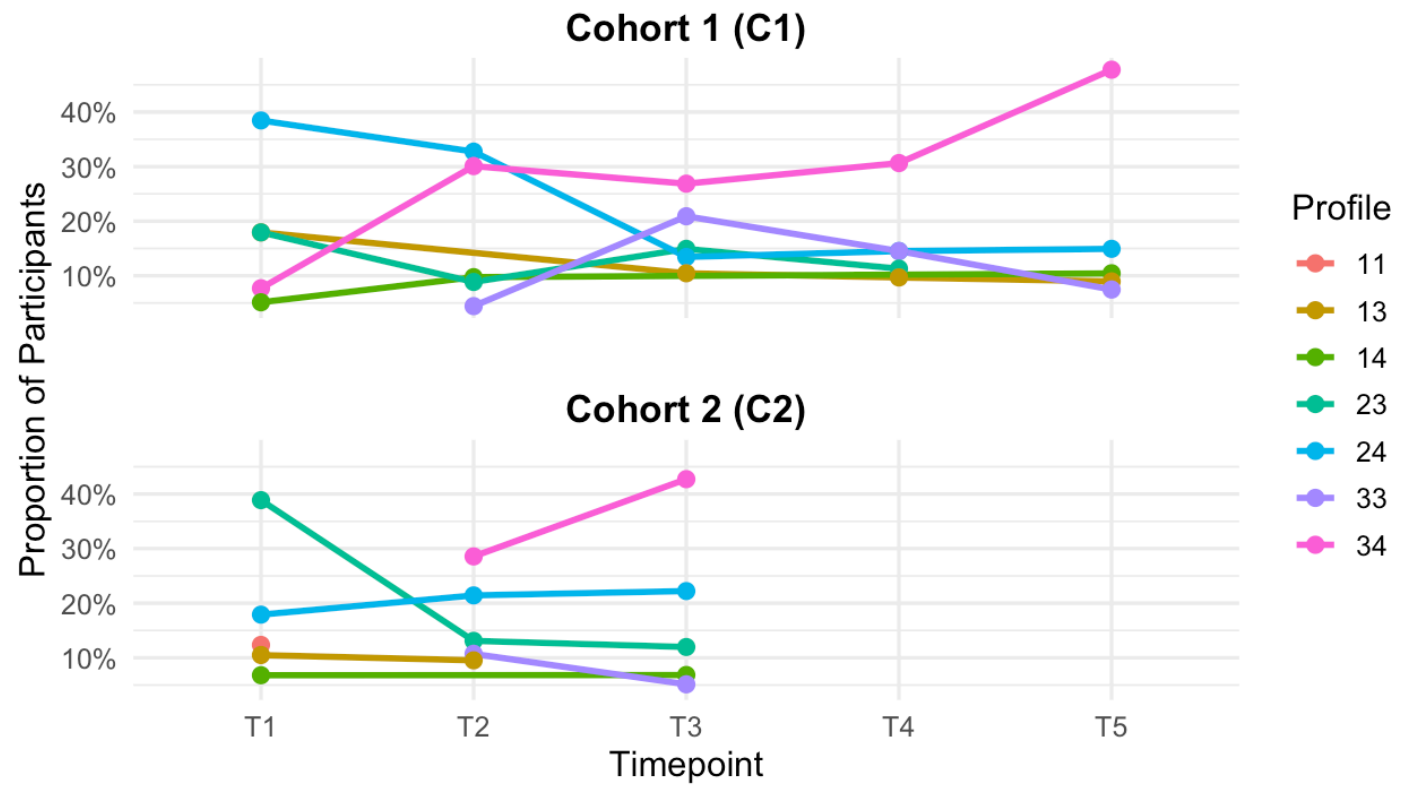
**Note:** Jump profile components are ordered as: Takeoff (Arm, Leg) + Landing (Arm, Foot, Shank).

Coh...	Timepoint	13121	13232	14122	23232	24232	34232	
<chr>	<chr>	<dbl>	<dbl>	<dbl>	<dbl>	<dbl>	<dbl>	
C1	T1	0.07692308	0.07692308	0.07692308	0.07692308	0.07692308	0.0000000	0.00
C1	T2	0.00000000	0.00000000	0.00000000	0.00000000	0.09734513	0.1592920	0.08
C1	T3	0.00000000	0.00000000	0.00000000	0.05970149	0.05970149	0.1940299	0.00
C1	T4	0.00000000	0.00000000	0.00000000	0.00000000	0.09677419	0.1935484	0.00
C1	T5	0.00000000	0.00000000	0.00000000	0.00000000	0.05970149	0.2238806	0.00
C2	T1	0.00000000	0.00000000	0.00000000	0.09876543	0.07407407	0.0000000	0.00
C2	T2	0.00000000	0.00000000	0.00000000	0.08928571	0.09523810	0.1250000	0.05
C2	T3	0.00000000	0.00000000	0.00000000	0.06837607	0.10256410	0.1965812	0.00

8 rows | 1-9 of 16 columns

**Note:** Jump profile components are ordered as: Takeoff (Arm, Leg) + Landing (Arm, Foot, Shank).

Top 5 Modal Profiles Over Time: Jump TO Profile Mode

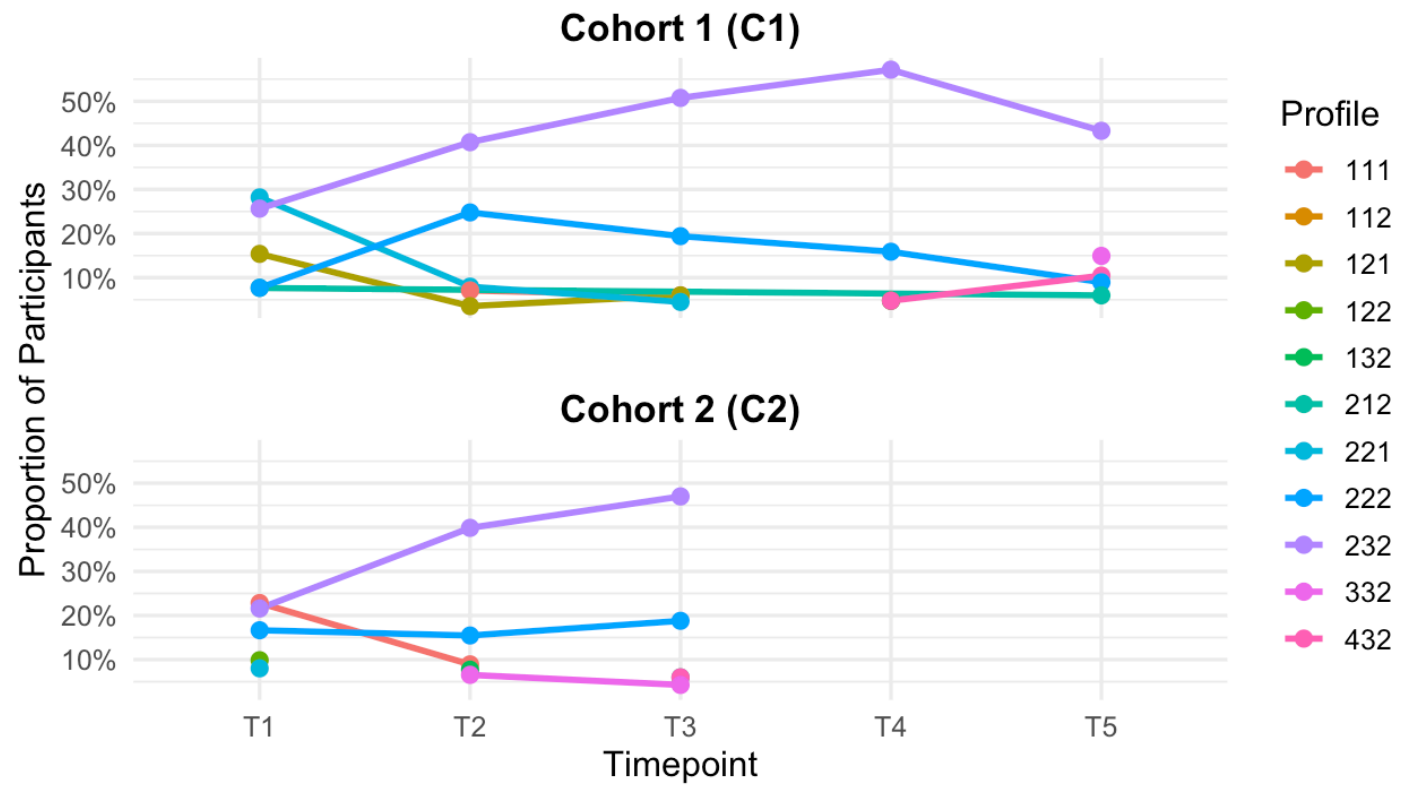


**Note:** Jump profile components are ordered as: Takeoff (Arm, Leg) + Landing (Arm, Foot, Shank).

Coh...	Timepoint	24	13	23	34	14	33	
<chr>	<chr>	<dbl>	<dbl>	<dbl>	<dbl>	<dbl>	<dbl>	
C1	T1	0.3846154	0.17948718	0.17948718	0.07692308	0.05128205	0.00000000	0.00
C1	T2	0.3274336	0.00000000	0.08849558	0.30088496	0.09734513	0.04424779	0.00
C1	T3	0.1343284	0.10447761	0.14925373	0.26865672	0.00000000	0.20895522	0.00
C1	T4	0.1451613	0.09677419	0.11290323	0.30645161	0.00000000	0.14516129	0.00
C1	T5	0.1492537	0.08955224	0.00000000	0.47761194	0.10447761	0.07462687	0.00
C2	T1	0.1790123	0.10493827	0.38888889	0.00000000	0.06790123	0.00000000	0.12
C2	T2	0.2142857	0.09523810	0.13095238	0.28571429	0.00000000	0.10714286	0.00
C2	T3	0.2222222	0.00000000	0.11965812	0.42735043	0.06837607	0.05128205	0.00
8 rows								

**Note:** Jump profile components are ordered as: Takeoff (Arm, Leg) + Landing (Arm, Foot, Shank).

Top 5 Modal Profiles Over Time: Jump LND Profile Mode



**Note:** Jump profile components are ordered as: Takeoff (Arm, Leg) + Landing (Arm, Foot, Shank).

Coh...	Timepoint	221	232	121	212	222	111	
<chr>	<chr>	<dbl>	<dbl>	<dbl>	<dbl>	<dbl>	<dbl>	
C1	T1	0.28205128	0.2564103	0.15384615	0.07692308	0.07692308	0.00000000	0.00
C1	T2	0.07964602	0.4070796	0.03539823	0.00000000	0.24778761	0.07079646	0.00
C1	T3	0.04477612	0.5074627	0.05970149	0.00000000	0.19402985	0.05970149	0.00
C1	T4	0.00000000	0.5714286	0.00000000	0.00000000	0.15873016	0.00000000	0.04
C1	T5	0.00000000	0.4328358	0.00000000	0.05970149	0.08955224	0.00000000	0.00
C2	T1	0.08024691	0.2160494	0.00000000	0.00000000	0.16666667	0.22839506	0.00
C2	T2	0.00000000	0.3988095	0.00000000	0.00000000	0.15476190	0.08928571	0.00
C2	T3	0.00000000	0.4700855	0.00000000	0.05982906	0.18803419	0.00000000	0.00

8 rows | 1-9 of 13 columns

**Note:** Jump profile components are ordered as: Takeoff (Arm, Leg) + Landing (Arm, Foot, Shank).

Add a new chunk by clicking the *Insert Chunk* button on the toolbar or by pressing *Cmd+Option+I*.

When you save the notebook, an HTML file containing the code and output will be saved alongside it (click the *Preview* button or press *Cmd+Shift+K* to preview the HTML file).

The preview shows you a rendered HTML copy of the contents of the editor. Consequently, unlike *Knit*, *Preview* does not run any R code chunks. Instead, the output of the chunk when it was last run in the editor is displayed.