

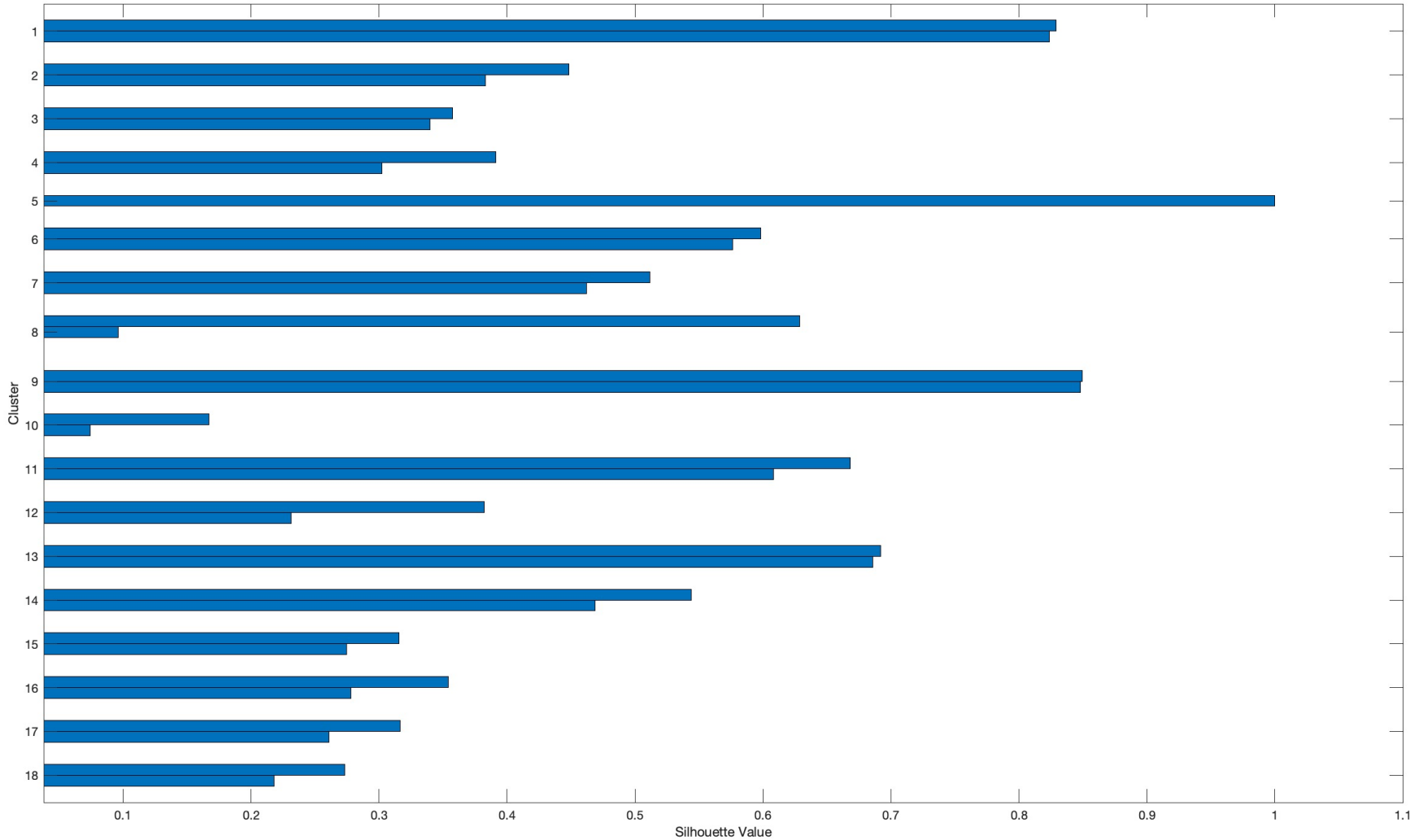
Synergy Matching

09/07/2021

Correspondence between PCs and clusters

Principal Component	Subject 3	Subject 4
PC 1	9	9
PC 2	2	1
PC 3	1	2
PC 4	16	10
PC 5	7	7
PC 6	6	6
PC 7	3	16
PC 8	15	17
PC 9	4	18
PC 10	18	3
PC 11	17	12
PC 12	13	4
PC 13	11	15
PC 14	10	13
PC 15	14	11
PC 16	12	14
PC 17	8	5
PC 18	8	8

Silhouette values for clusters



- A silhouette value measures how similar a point is to points in its own cluster, when compared to points in other clusters. Values range from -1 to 1 . A high silhouette value indicates that a point is well matched to its own cluster, and poorly matched to other clusters.
- Although it cannot be perceived, Cluster 8 has three elements.

Synergies construction

Principal Component	Subject 3	Subject 4
PC 1	9	9
PC 2	2	1
PC 3	1	2
PC 4	16	10
PC 5	7	7
PC 6	6	6
PC 7	3	16
PC 8	15	17
PC 9	4	18
PC 10	18	3
PC 11	17	12
PC 12	13	4
PC 13	11	15
PC 14	10	13
PC 15	14	11
PC 16	12	14
PC 17	8	5
PC 18	8	8

Synergy 1

Synergies construction

Principal Component	Subject 3	Subject 4
PC 1	9	9
PC 2	2	1
PC 3	1	2
PC 4	16	10
PC 5	7	7
PC 6	6	6
PC 7	3	16
PC 8	15	17
PC 9	4	18
PC 10	18	3
PC 11	17	12
PC 12	13	4
PC 13	11	15
PC 14	10	13
PC 15	14	11
PC 16	12	14
PC 17	8	5
PC 18	8	8



Synergy 2

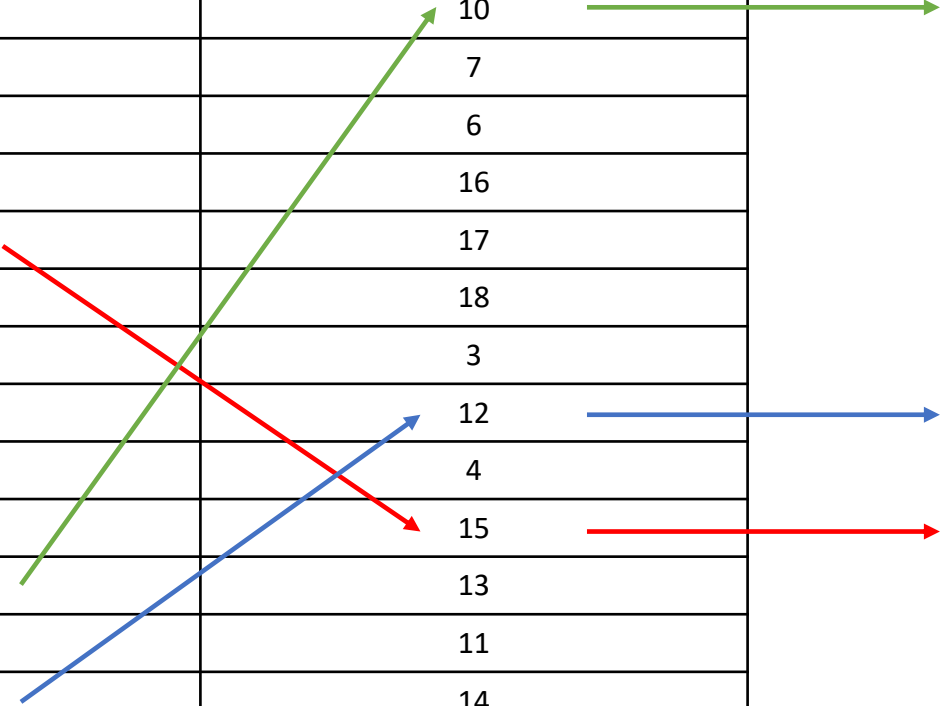
Synergies construction

Principal Component	Subject 3	Subject 4
PC 1	9	9
PC 2	2	1
PC 3	1	2
PC 4	16	10
PC 5	7	7
PC 6	6	6
PC 7	3	16
PC 8	15	17
PC 9	4	18
PC 10	18	3
PC 11	17	12
PC 12	13	4
PC 13	11	15
PC 14	10	13
PC 15	14	11
PC 16	12	14
PC 17	8	5
PC 18	8	8

Synergy 3

Synergies construction

Principal Component	Subject 3	Subject 4	
PC 1	9	9	
PC 2	2	1	
PC 3	1	2	
PC 4	16	10	→ Synergy 14
PC 5	7	7	
PC 6	6	6	
PC 7	3	16	
PC 8	15	17	
PC 9	4	18	
PC 10	18	3	
PC 11	17	12	→ Synergy 16
PC 12	13	4	
PC 13	11	15	→ Synergy 8
PC 14	10	13	
PC 15	14	11	
PC 16	12	14	
PC 17	8	5	
PC 18	8	8	



Synergies construction

Principal Component	Subject 3	Subject 4
PC 1	9	9
PC 2	2	1
PC 3	1	2
PC 4	16	10
PC 5	7	7
PC 6	6	6
PC 7	3	16
PC 8	15	17
PC 9	4	18
PC 10	18	3
PC 11	17	12
PC 12	13	4
PC 13	11	15
PC 14	10	13
PC 15	14	11
PC 16	12	14
PC 17	⑧	⑤
PC 18	⑧	⑧

- Cluster 8 has 3 elements, but one of them (Subject 3 PC 18) has a silhouette score close to 0.
- Cluster 5 has only one element (subject 4 PC 17).

Synergies construction

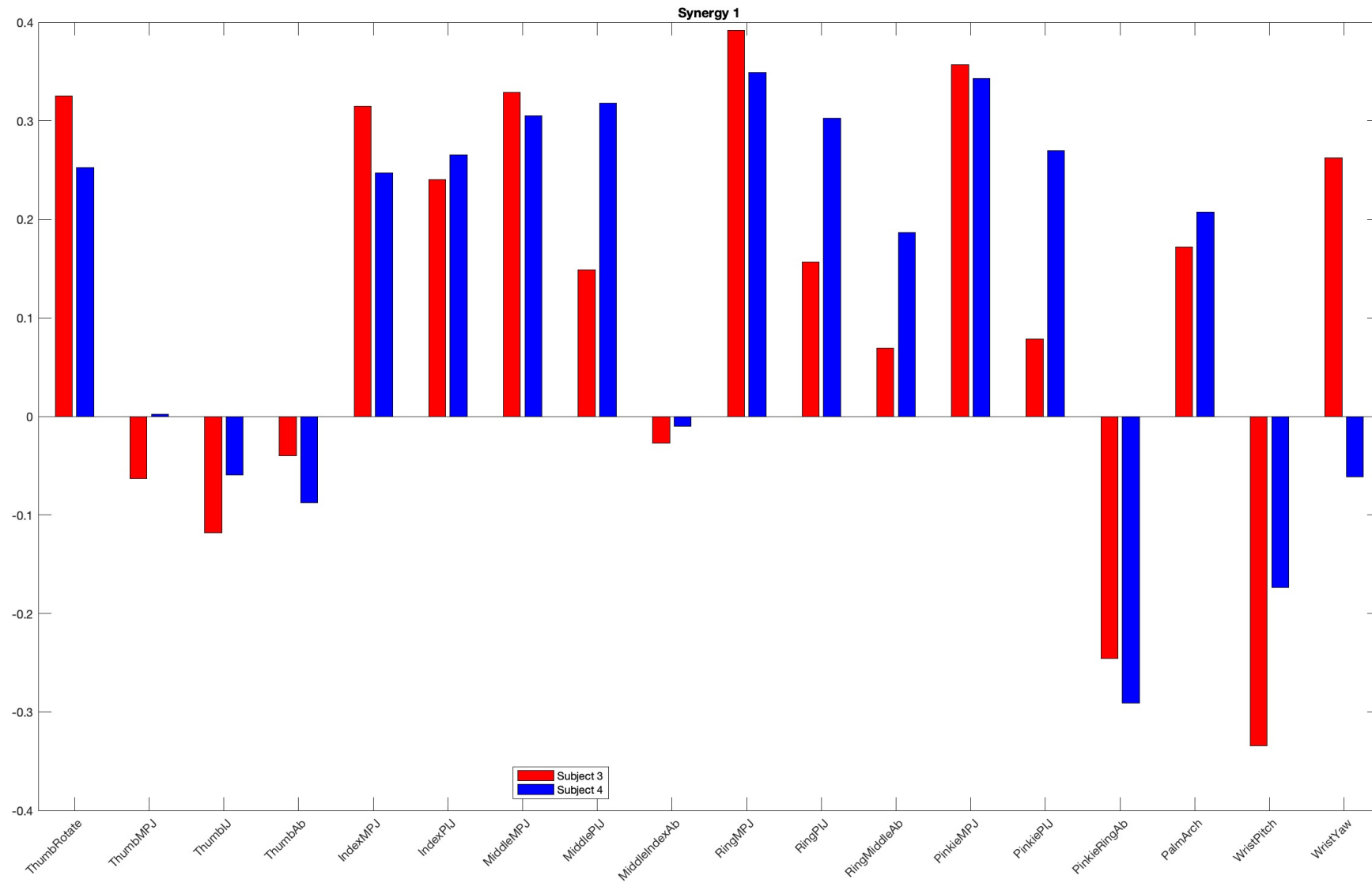
Principal Component	Subject 3	Subject 4
PC 1	9	9
PC 2	2	1
PC 3	1	2
PC 4	16	10
PC 5	7	7
PC 6	6	6
PC 7	3	16
PC 8	15	17
PC 9	4	18
PC 10	18	3
PC 11	17	12
PC 12	13	4
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PC 14	10	13
PC 15	14	11
PC 16	12	14
PC 17	8	5
PC 18	8	8

Synergy 18
Synergy 17

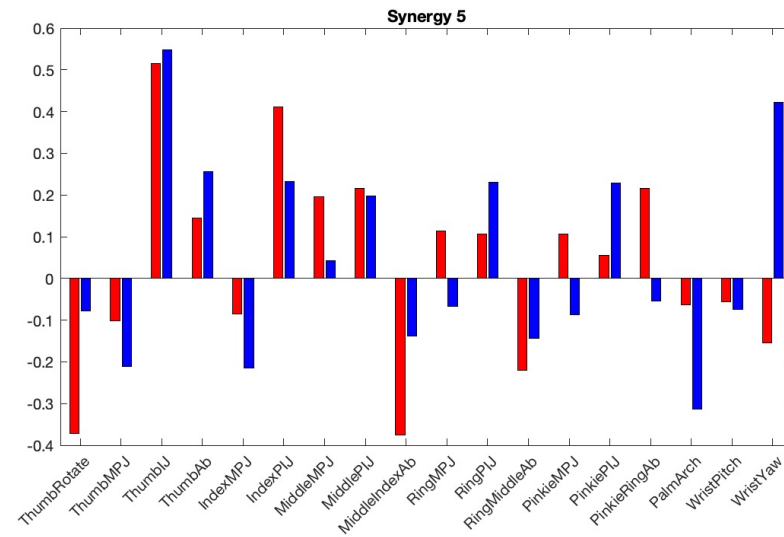
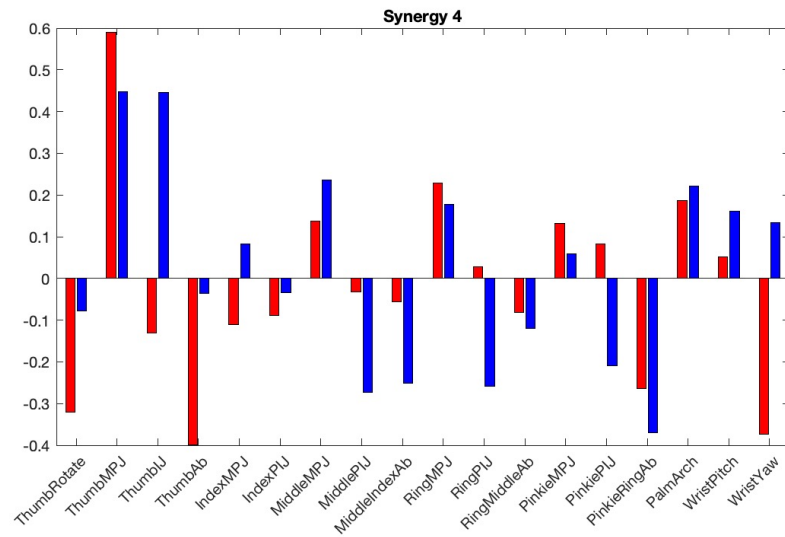
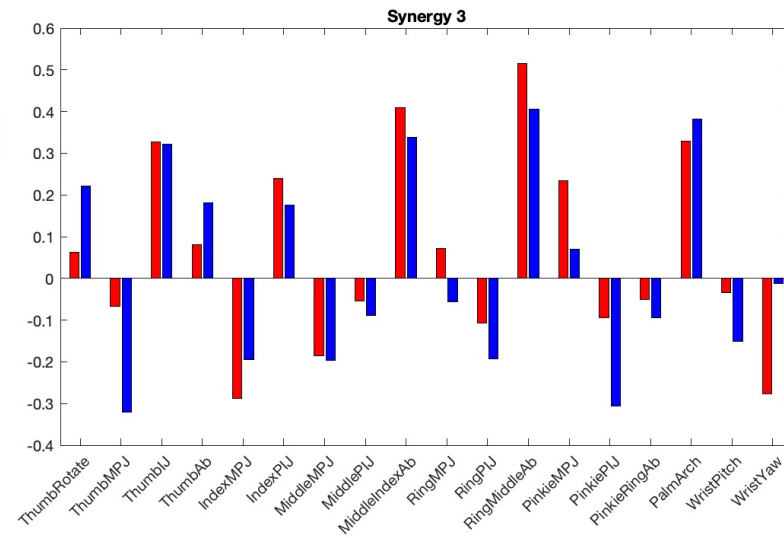
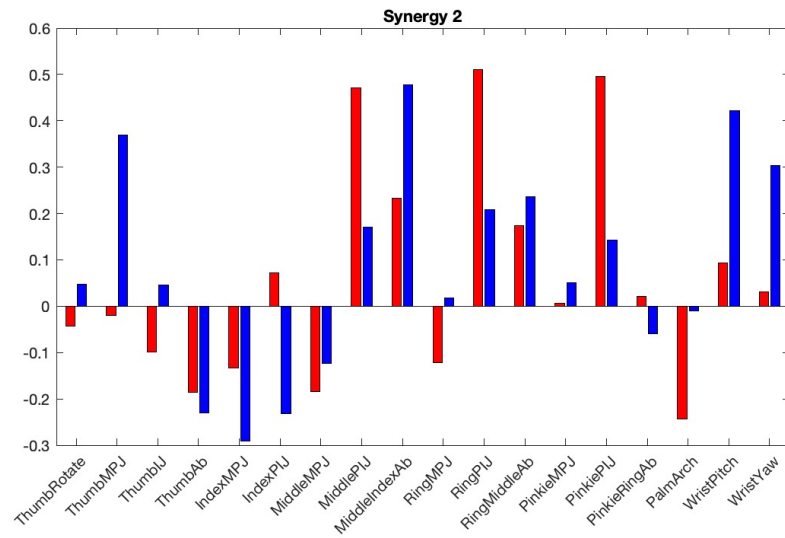
Correspondence between synergies and PCs

Synergies	Subject 3 PCs	Subject 4 PCs
Synergy 1	PC 1	PC 1
Synergy 2	PC 2	PC 3
Synergy 3	PC 3	PC 2
Synergy 4	PC 4	PC 7
Synergy 5	PC 5	PC 5
Synergy 6	PC 6	PC 6
Synergy 7	PC 7	PC 10
Synergy 8	PC 8	PC 13
Synergy 9	PC 9	PC 12
Synergy 10	PC 10	PC 9
Synergy 11	PC 11	PC 8
Synergy 12	PC 12	PC 14
Synergy 13	PC 13	PC 15
Synergy 14	PC 14	PC 4
Synergy 15	PC 15	PC 16
Synergy 16	PC 16	PC 11
Synergy 17	PC 17	PC 18
Synergy 18	PC 18	PC 17

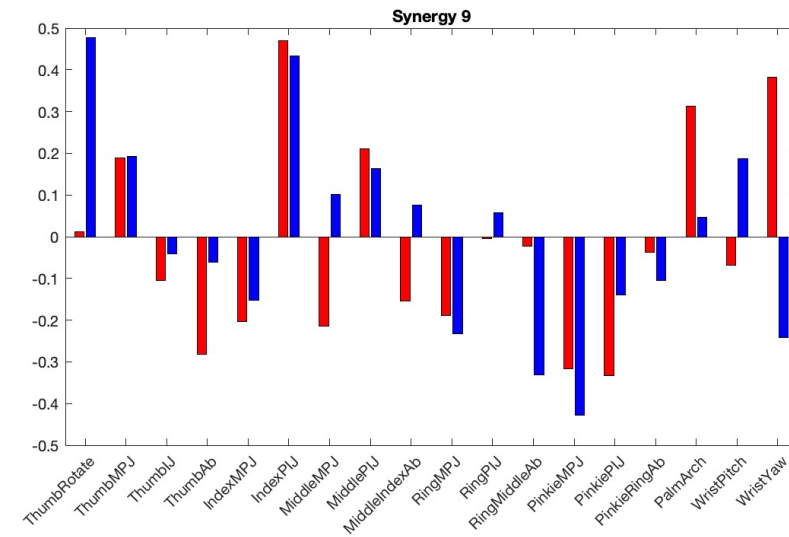
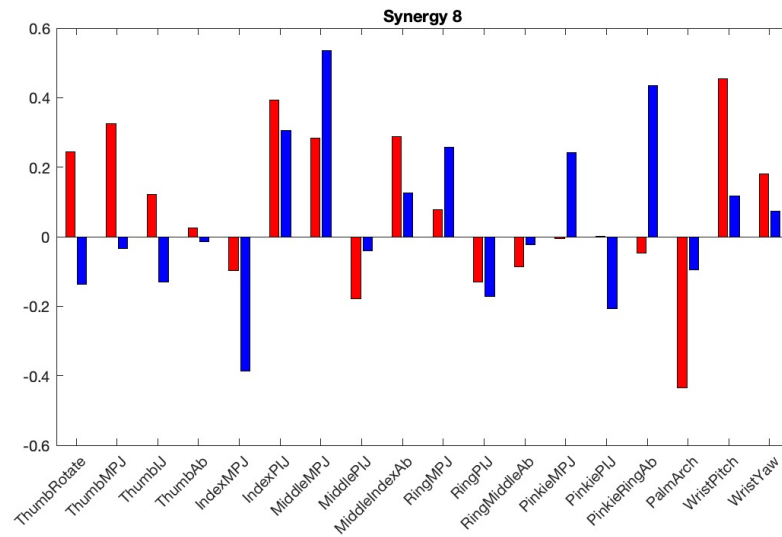
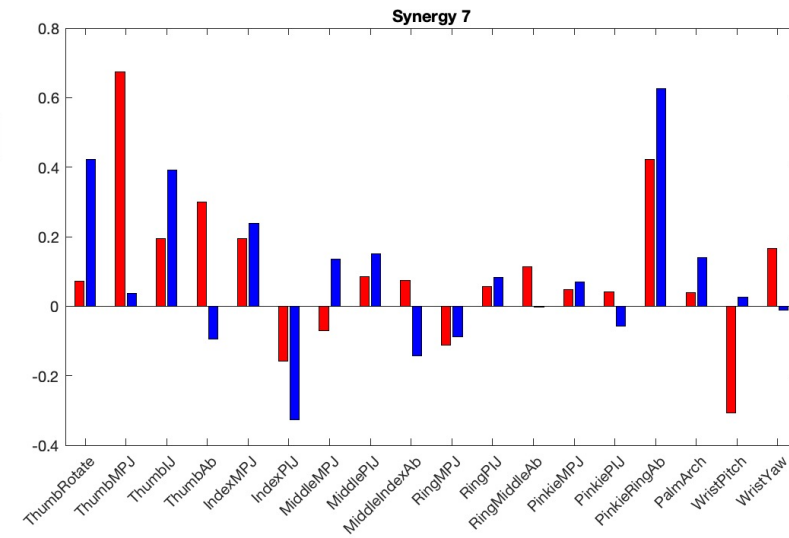
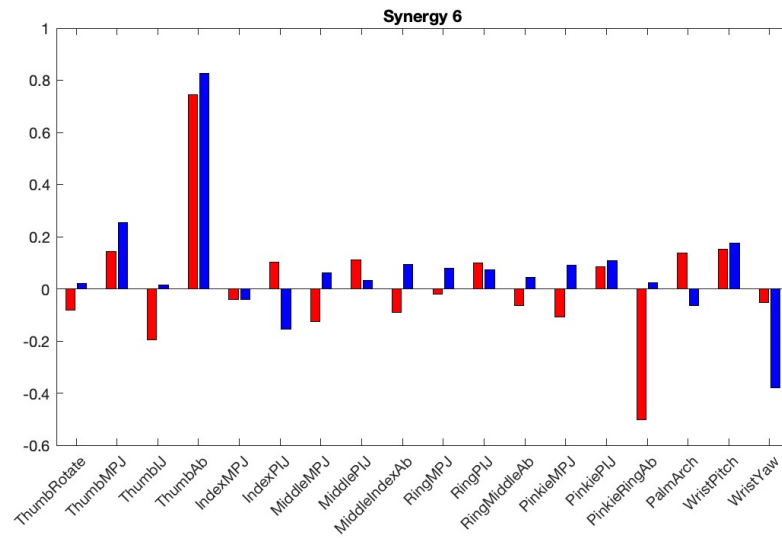
Synergies representations



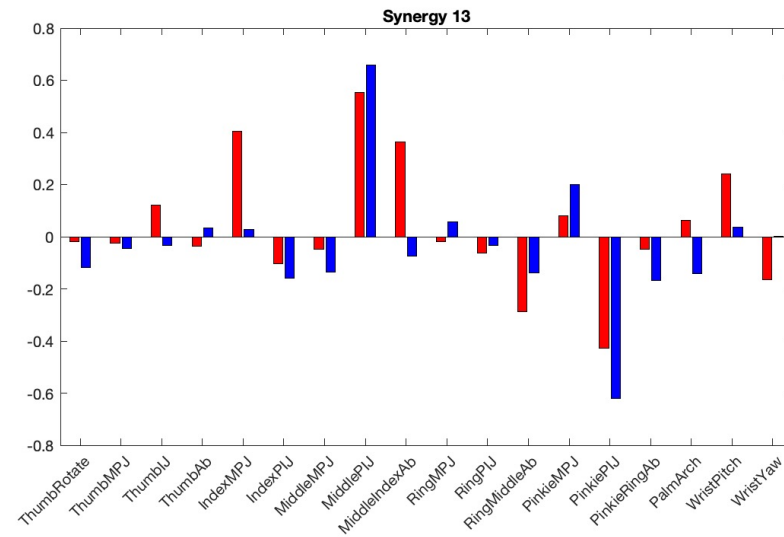
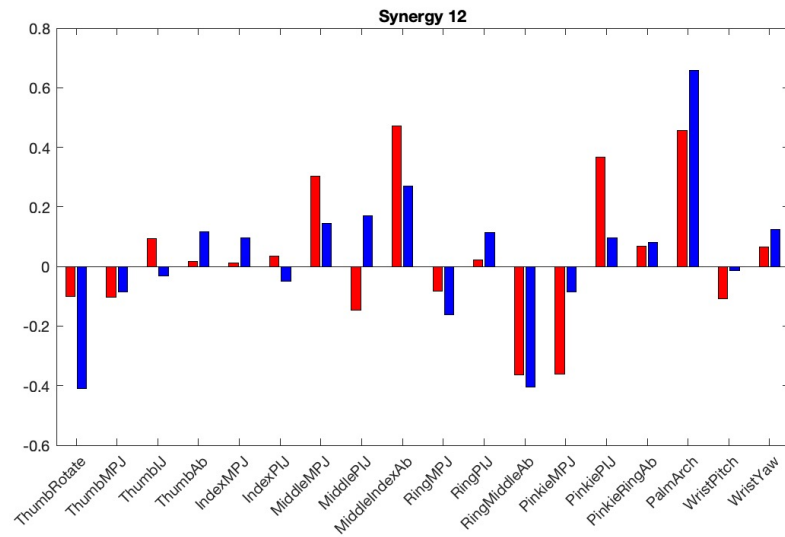
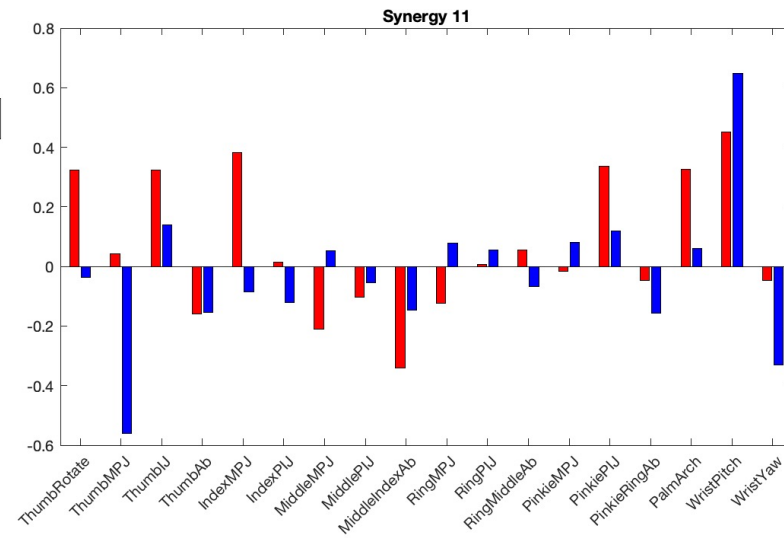
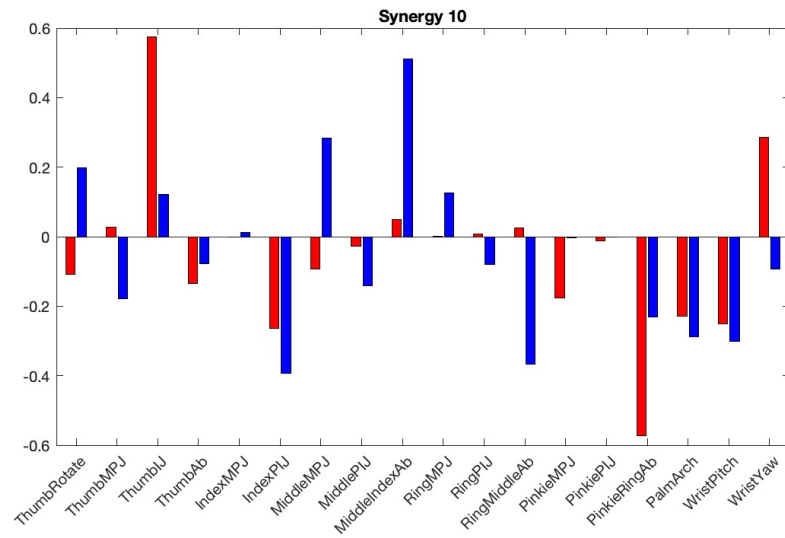
Synergies representations



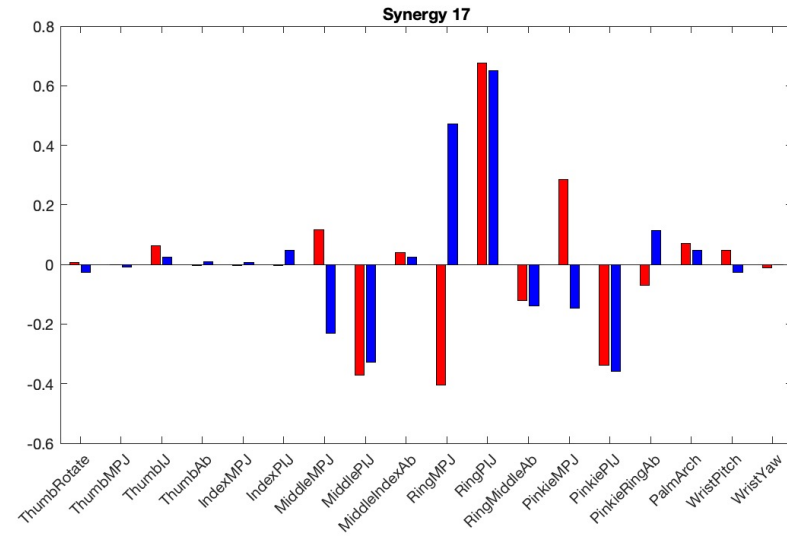
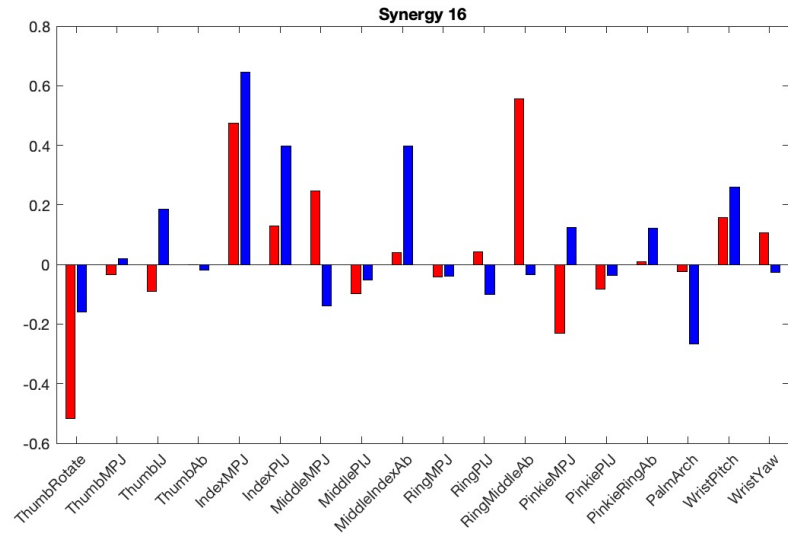
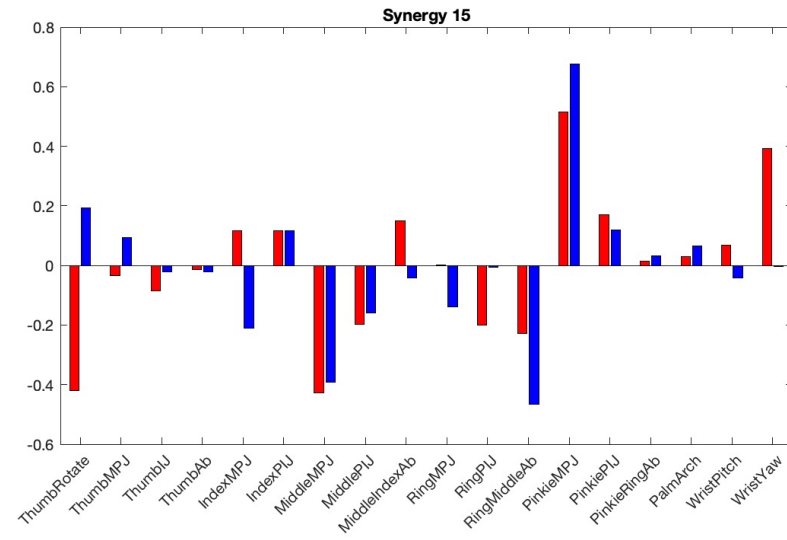
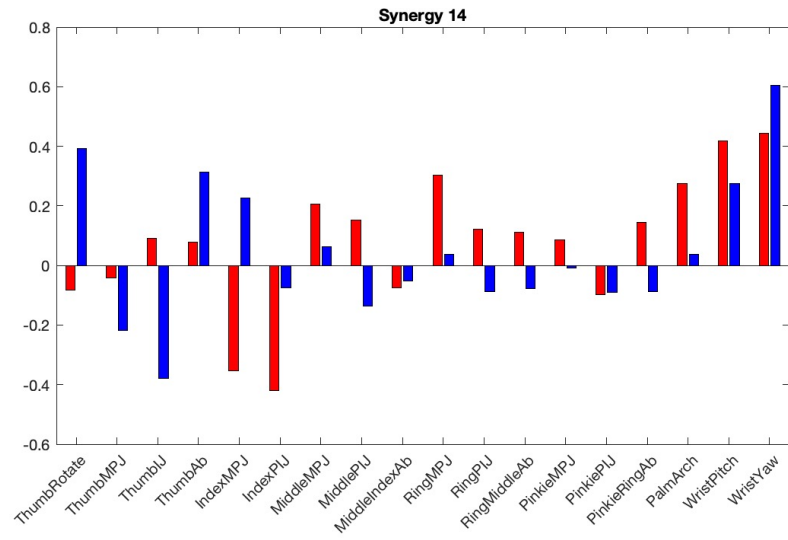
Synergies representations



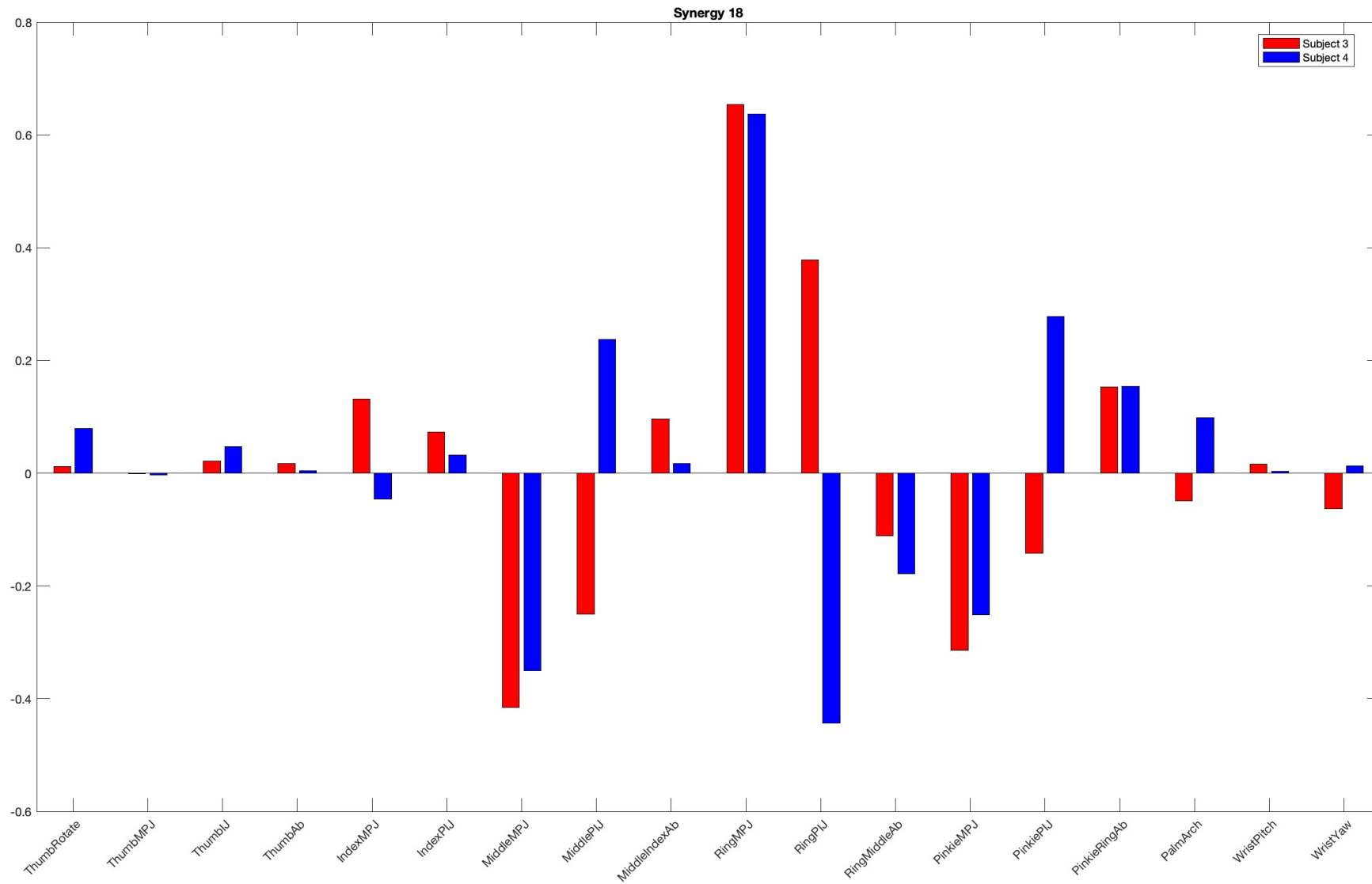
Synergies representations



Synergies representations



Synergies representations



Synergies construction including All Subjects data

PCs	Subject 3	Subject 4	All Subjects
PC 1	7	7	7
PC 2	18	4	16
PC 3	4	18	18
PC 4	15	16	18
PC 5	15	5	15
PC 6	2	2	2
PC 7	1	15	10
PC 8	6	13	17
PC 9	17	5	1
PC 10	5	1	5
PC 11	13	9	13
PC 12	12	6	6
PC 13	11	10	9
PC 14	16	12	12
PC 15	8	11	10
PC 16	9	8	8
PC 17	14	3	14
PC 18	3	3	3

Synergies construction including All Subjects data

PCs	Subject 3	Subject 4	All Subjects
PC 1	7	7	7
PC 2	18	4	16
PC 3	4	18	18
PC 4	15	16	18
PC 5	15	5	15
PC 6	2	2	2
PC 7	1	15	10
PC 8	6	13	17
PC 9	17	5	1
PC 10	5	1	5
PC 11	13	9	13
PC 12	12	6	6
PC 13	11	10	9
PC 14	16	12	12
PC 15	8	11	10
PC 16	9	8	8
PC 17	14	3	14
PC 18	3	3	3

The diagram illustrates the construction of synergies between different Principal Components (PCs) across three subjects. Arrows indicate the flow of information or synergy from one subject's data to another's, specifically focusing on the values for PC 8, PC 11, PC 12, PC 13, PC 15, and PC 16.

- A blue arrow points from the value 6 in PC 8 (Subject 3) to the value 9 in PC 11 (Subject 4).
- A yellow arrow points from the value 9 in PC 11 (Subject 4) to the value 6 in PC 12 (All Subjects).
- A blue arrow points from the value 6 in PC 12 (All Subjects) to the value 6 in PC 12 (Subject 4).
- A yellow arrow points from the value 6 in PC 12 (Subject 4) to the value 9 in PC 13 (All Subjects).
- A red arrow points from the value 8 in PC 15 (Subject 3) to the value 8 in PC 16 (Subject 4).
- A red arrow points from the value 9 in PC 16 (Subject 3) to the value 8 in PC 16 (Subject 4).

Synergies construction including All Subjects data

PCs	Subject 3	Subject 4	All Subjects
PC 1	7	7	7
PC 2	18	4	16
PC 3	4	18	18
PC 4	15	16	18
PC 5	15	5	15
PC 6	2	2	2
PC 7	1	15	10
PC 8	6	13	17
PC 9	17	5	1
PC 10	5	1	5
PC 11	13	9	13
PC 12	12	6	6
PC 13	11	10	9
PC 14	16	12	12
PC 15	8	11	10
PC 16	9	8	8
PC 17	14	3	14
PC 18	3	3	3

The diagram illustrates the construction of synergies by combining data from individual subjects. Arrows indicate the following connections:

- Red arrows: PC 2 (Subject 3: 18, Subject 4: 4) → PC 2 (All Subjects: 16); PC 4 (Subject 3: 15, Subject 4: 16) → PC 4 (All Subjects: 18); PC 14 (Subject 3: 16, Subject 4: 12) → PC 14 (All Subjects: 12).
- Yellow arrows: PC 8 (Subject 3: 6, Subject 4: 13) → PC 11 (All Subjects: 13); PC 11 (Subject 3: 13, Subject 4: 9) → PC 11 (All Subjects: 13).
- Blue arrows: PC 12 (Subject 3: 12, Subject 4: 6) → PC 14 (All Subjects: 12); PC 14 (Subject 3: 16, Subject 4: 12) → PC 14 (All Subjects: 12).

Synergies construction including All Subjects data

PCs	Subject 3	Subject 4	All Subjects
PC 1	7	7	7
PC 2	18	4	16
PC 3	4	18	18
PC 4	15	16	18
PC 5	15	5	15
PC 6	2	2	2
PC 7	1	15	10
PC 8	6	13	17
PC 9	17	5	1
PC 10	5	1	5
PC 11	13	9	13
PC 12	12	6	6
PC 13	11	10	9
PC 14	16	12	12
PC 15	8	11	10
PC 16	9	8	8
PC 17	14	3	14
PC 18	3	3	3

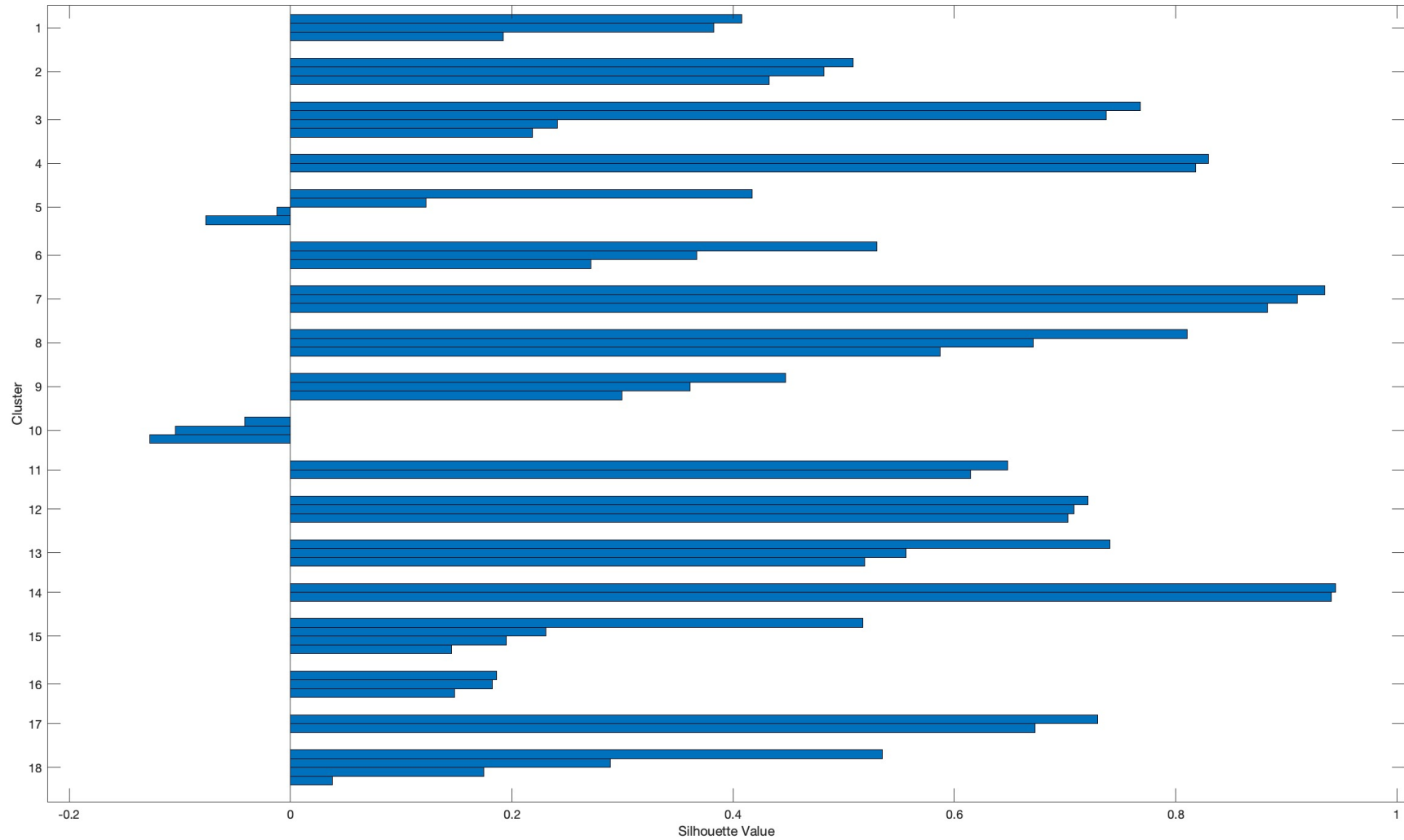
Synergies construction including All Subjects data

PCs	Subject 3	Subject 4	All Subjects
PC 1	7	7	7
PC 2	18	4	16
PC 3	4	18	18
PC 4	15	16	18
PC 5	15	5	15
PC 6	2	2	2
PC 7	1	15	10
PC 8	6	13	17
PC 9	17	5	1
PC 10	5	1	5
PC 11	13	9	13
PC 12	12	6	6
PC 13	11	10	9
PC 14	16	12	12
PC 15	8	11	10
PC 16	9	8	8
PC 17	14	3	14
PC 18	3	3	3

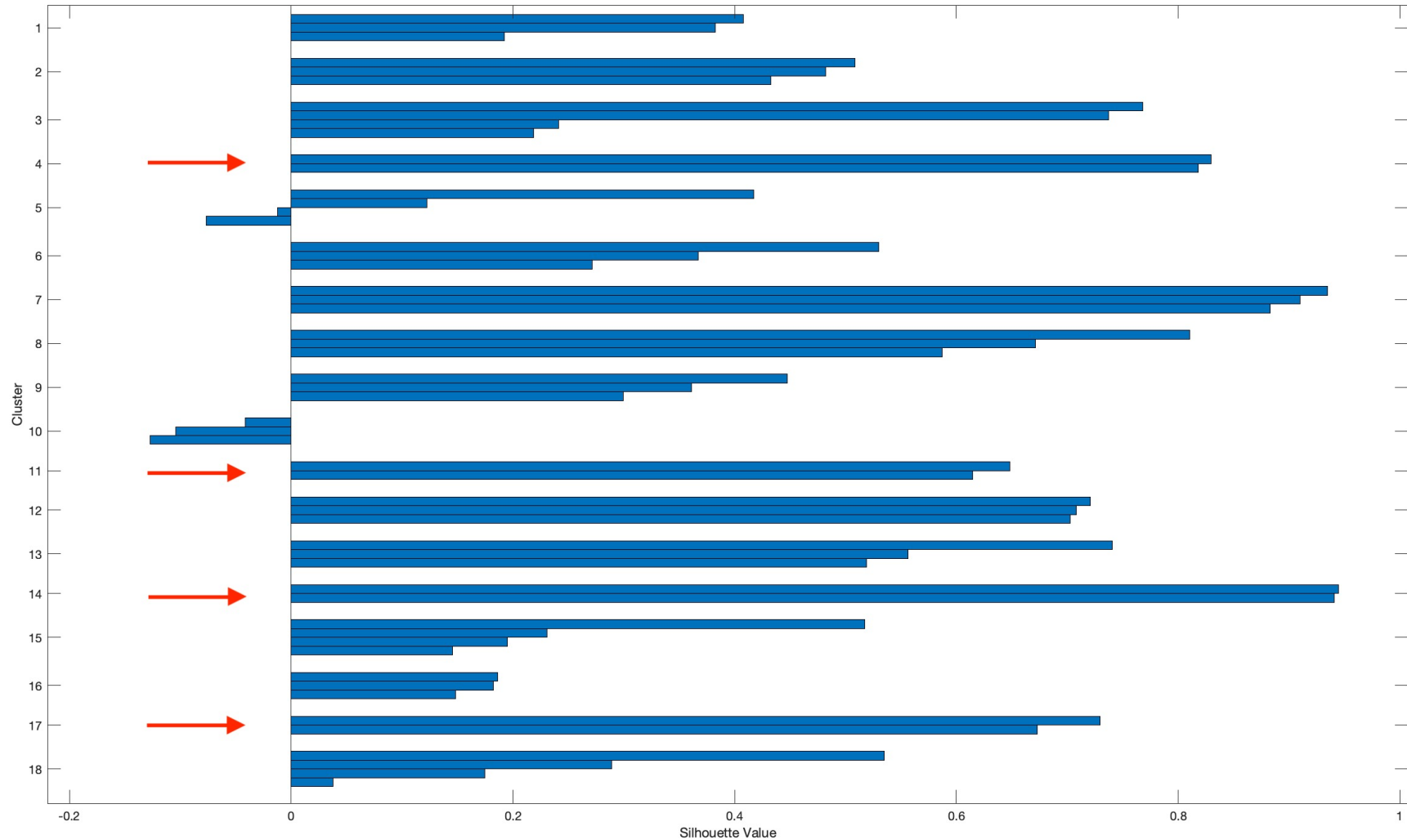
Synergies construction including All Subjects data

PCs	Subject 3	Subject 4	All Subjects
PC 1	7	7	7
PC 2	18	4	16
PC 3	4	18	18
PC 4	15	16	18
PC 5	15	5	15
PC 6	2	2	2
PC 7	1	15	10
PC 8	6	13	17
PC 9	17	5	1
PC 10	5	1	5
PC 11	13	9	13
PC 12	12	6	6
PC 13	11	10	9
PC 14	16	12	12
PC 15	8	11	10
PC 16	9	8	8
PC 17	14	3	14
PC 18	3	3	3

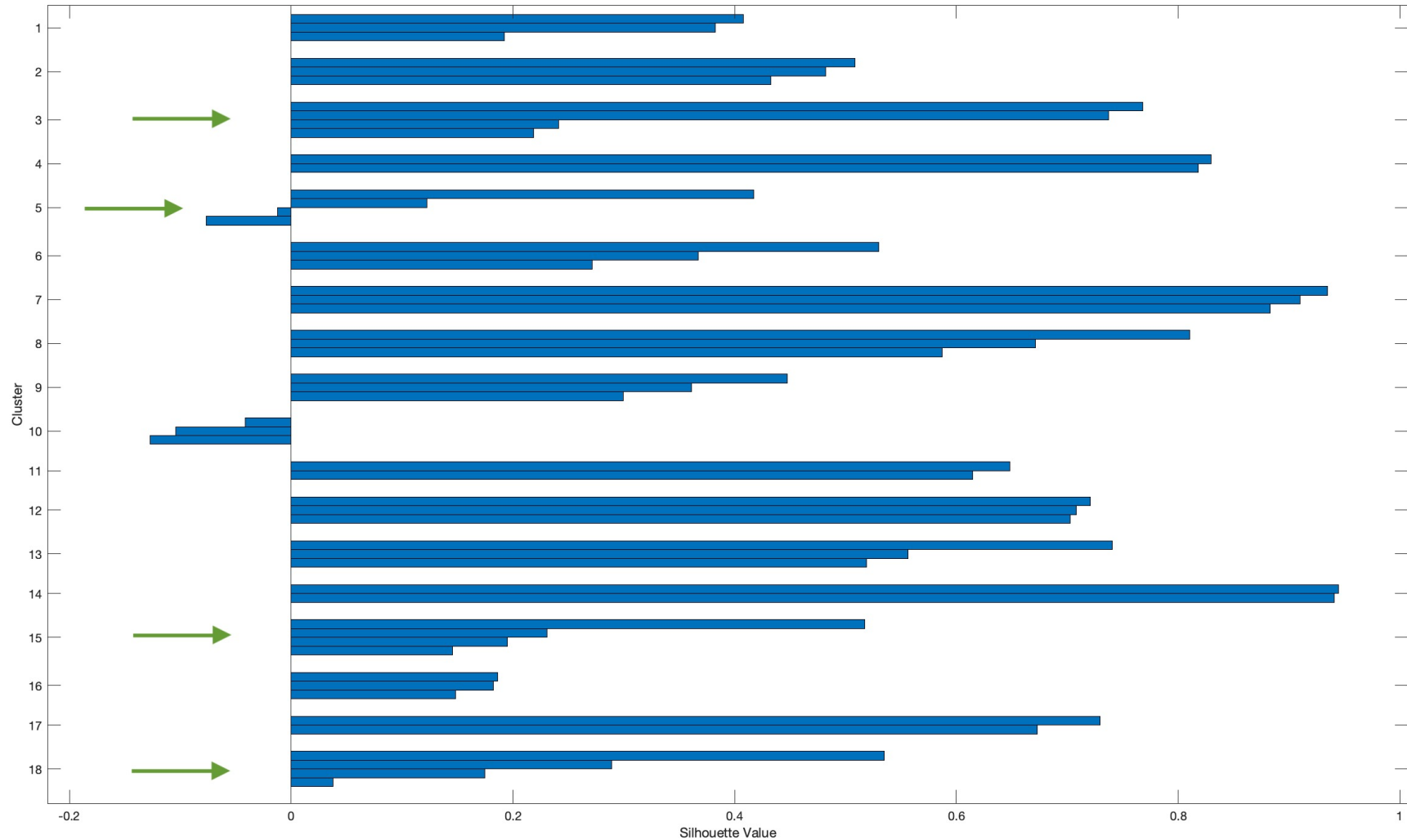
Silhouette values for clusters including All Subjects data



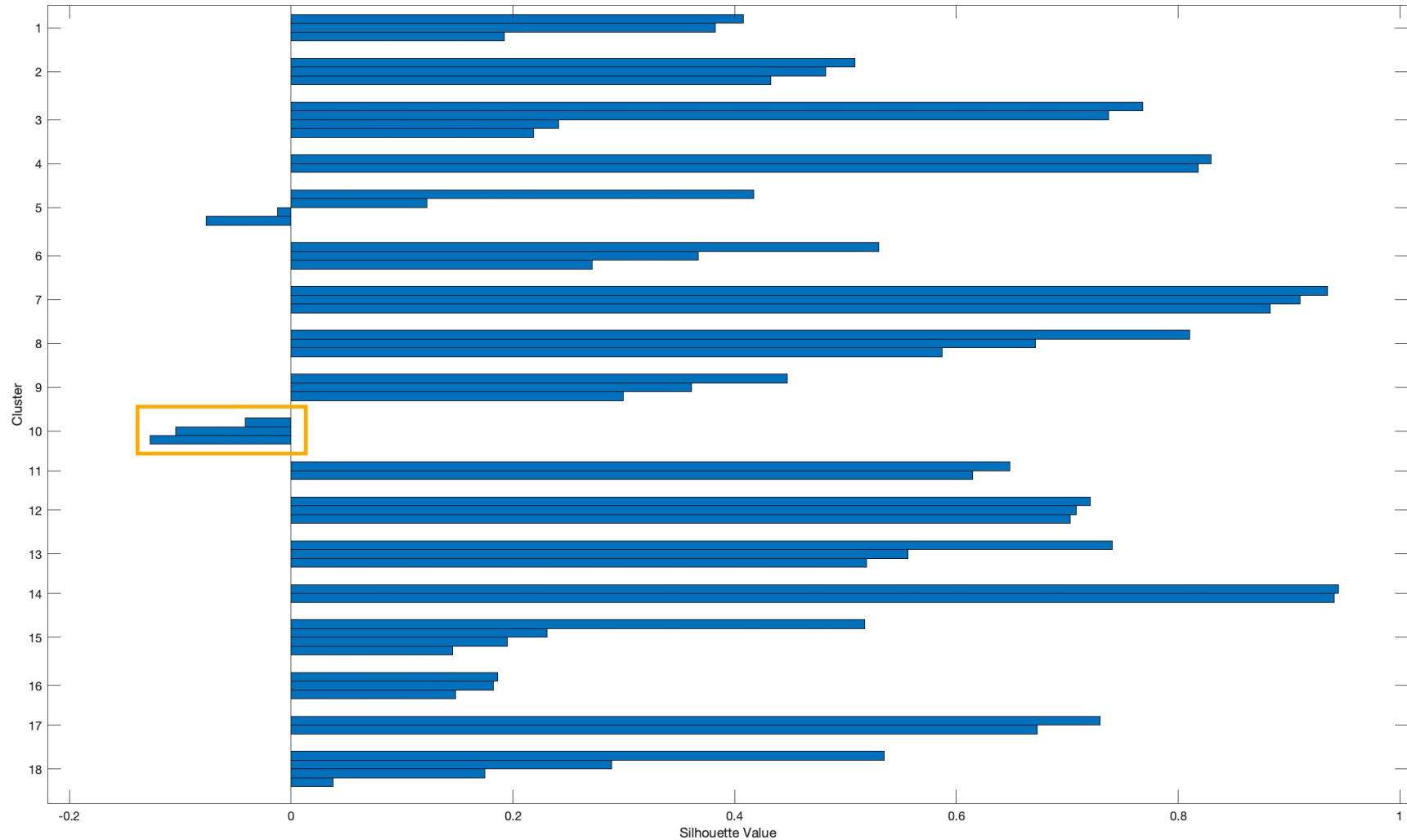
Silhouette values for clusters including All Subjects data



Silhouette values for clusters including All Subjects data



Silhouette values for clusters including All Subjects data



Next steps

- Iterative clustering.
- Calculate dynamic synergies (how synergies evolve during time).
- Synergies representations.

Items to comment

- Mendeley.