

# Social network intervention to promote physical activity in youth

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# my movez

 Promoting a healthy lifestyle for children and adolescents.

 Focus on physical activity



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PHD - PHYSICAL ACTIVITY



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PHD - NUTRITION



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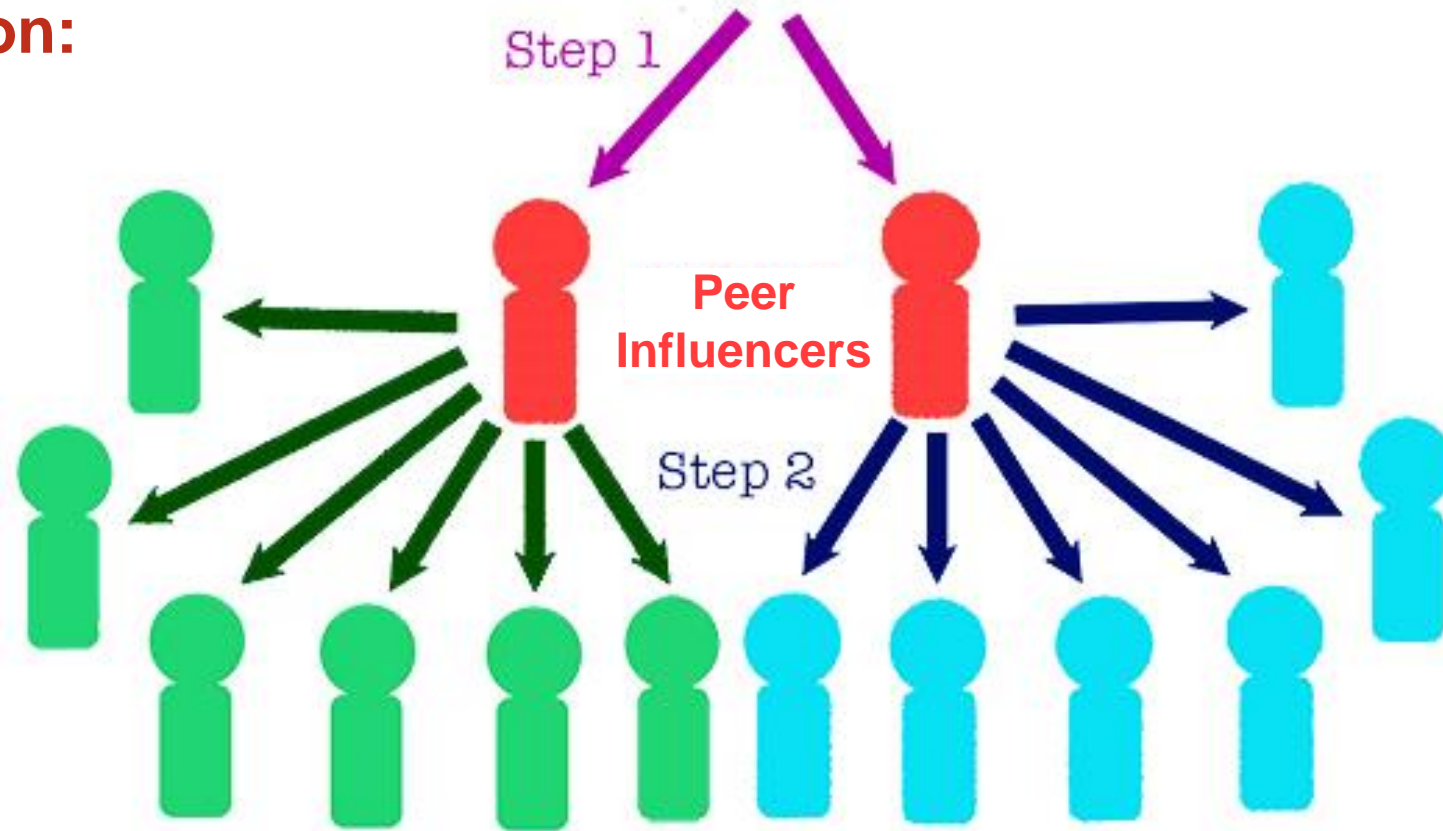
Esther Rozendaal  
PROJECT ADVISOR



Rebecca de Leeuw  
PROJECT ADVISOR

## Social network intervention:

**my movez**

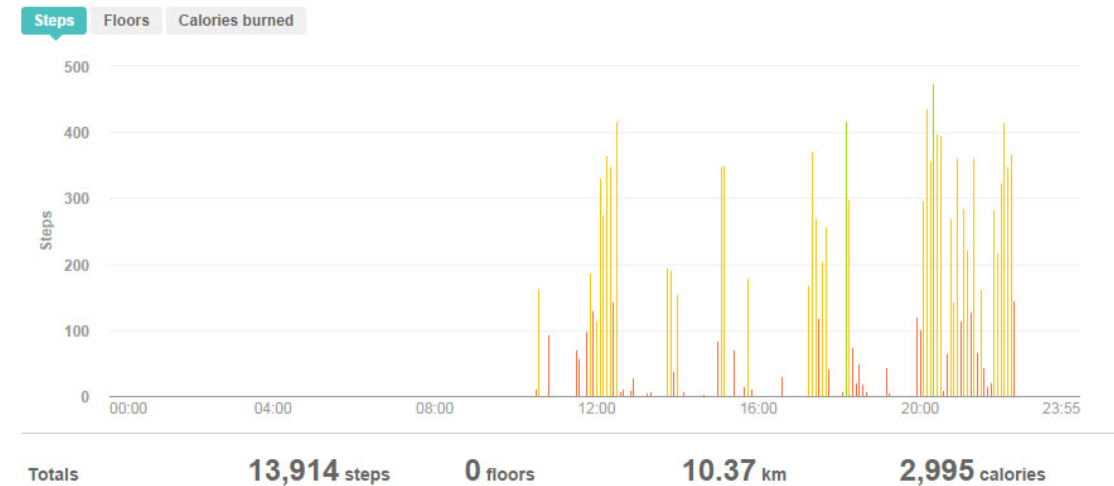
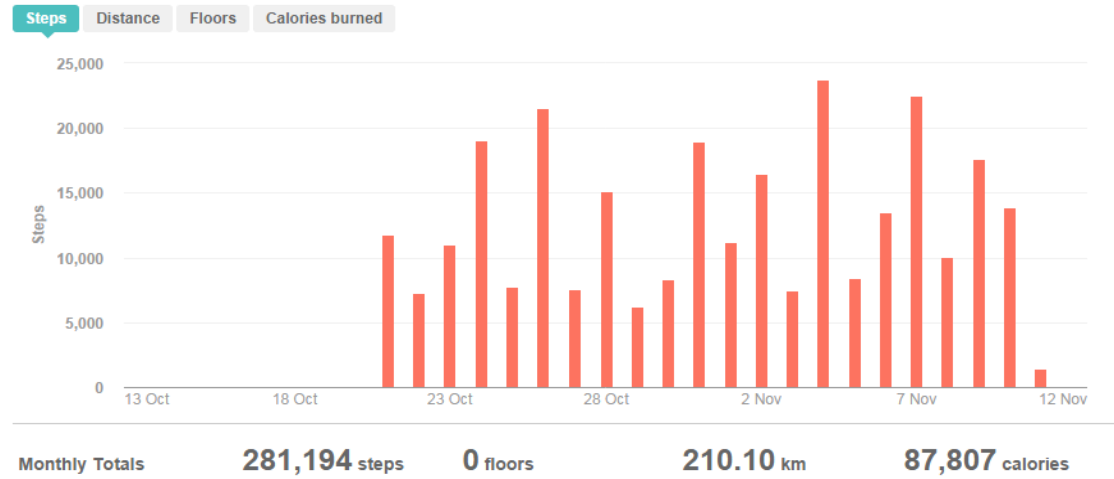


## MyMovez Wearable lab





# Fitbit Flex



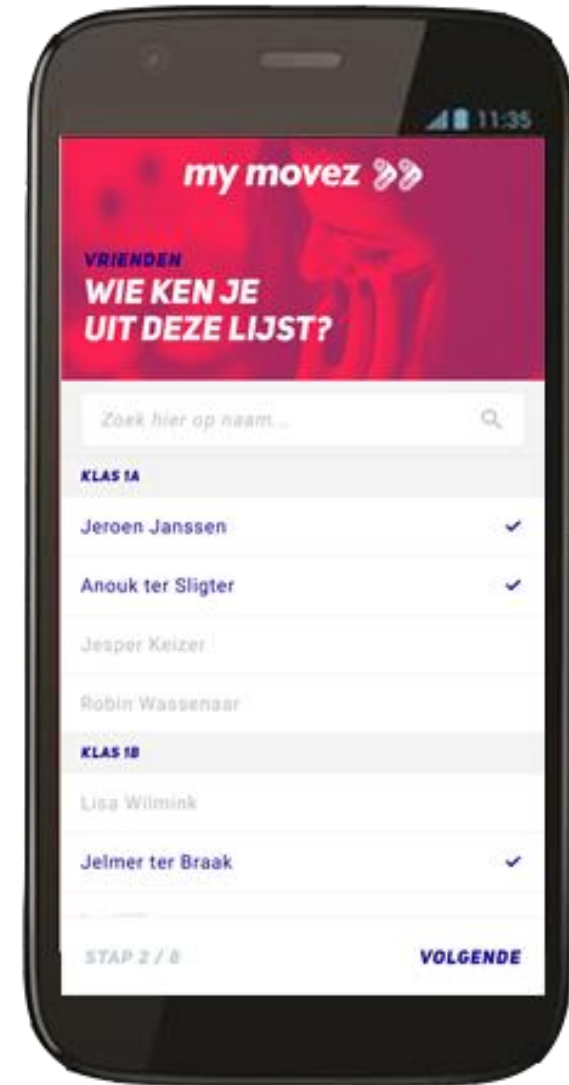
## Smartphone

- Communication with Fitbit and server



# Smartphone

- Communication with Fitbit and server
- Assessment of social network
  - Friendship nominations



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- Questionnaires (e.g. Daily food intake)





# Smartphone

- Communication with Fitbit and server
- Assessment of social network
  - Friendship nominations
- Questionnaires (e.g. Daily food intake)
- Social platform (Social Buzz)



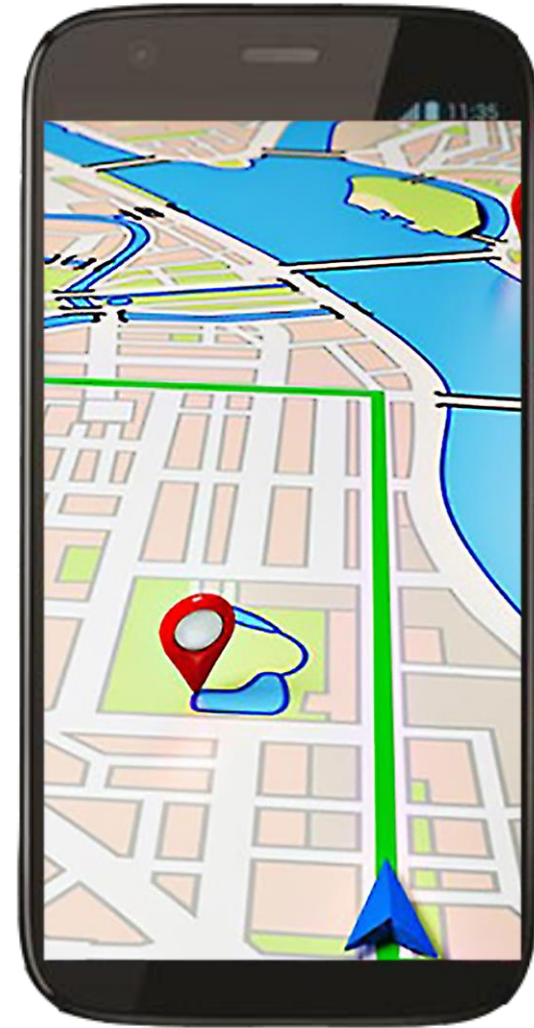
# Smartphone

- Communication with Fitbit and server
- Assessment of social network
  - Friendship nominations
- Questionnaires (e.g. Daily food intake)
- Social platform (Social Buzz)
- Pictures (experience sampling)



# Smartphone

- Communication with Fitbit and server
- Assessment of social network
  - Friendship nominations
- Questionnaires (e.g. Daily food intake)
- Social platform (social Buzz)
- Pictures (e.g. media exposure or food)
- GPS coordinates (cycling)



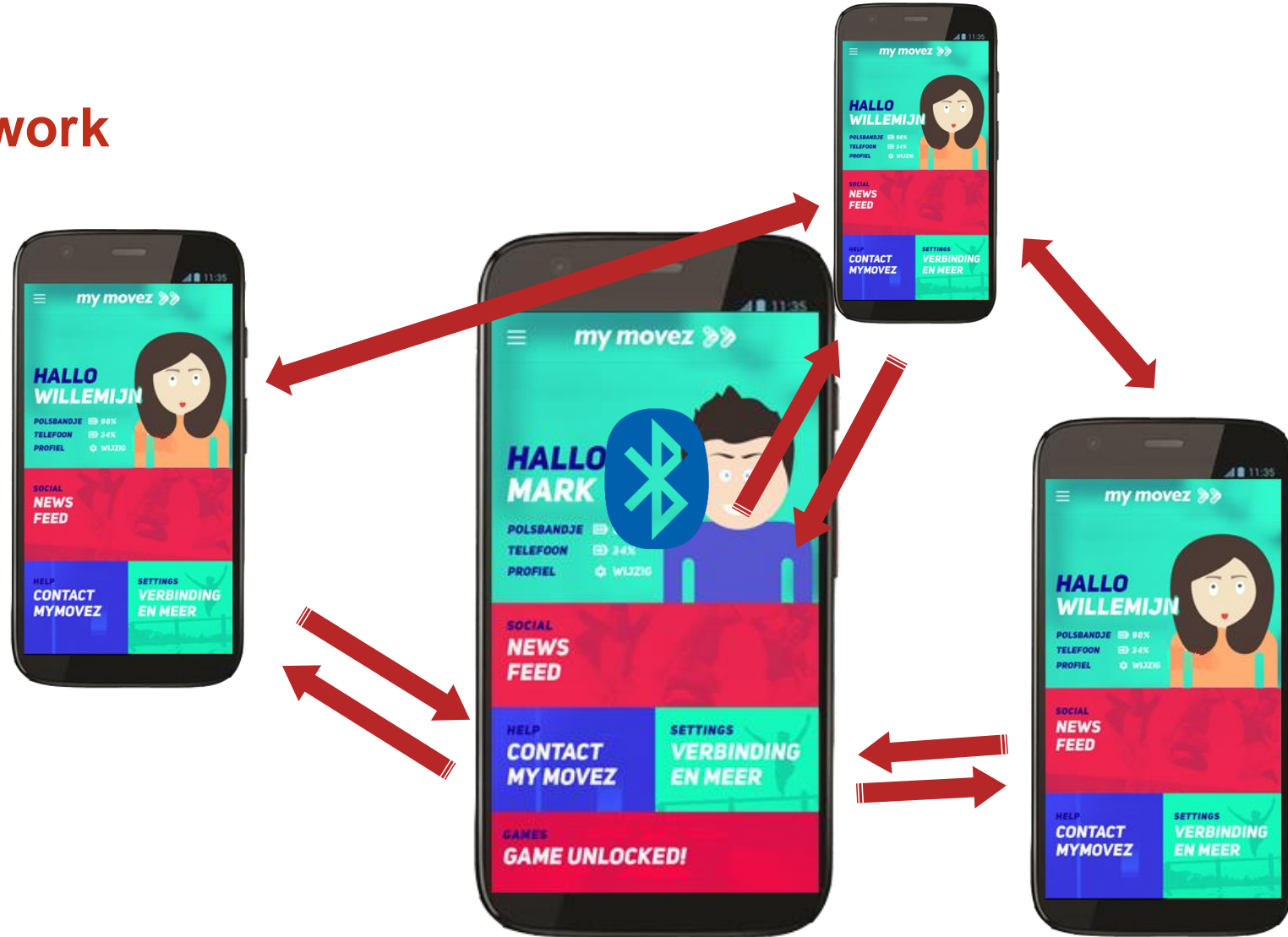
# Smartphone

- Communication with Fitbit and server
- Assessment of social network
  - Friendship nominations
- Questionnaires (e.g. Daily food intake)
- Social platform (social Buzz)
- Pictures (e.g. media exposure or food)
- GPS coordinates (cycling)
- Objective measure of social network
  - We termed this *the beacon network*

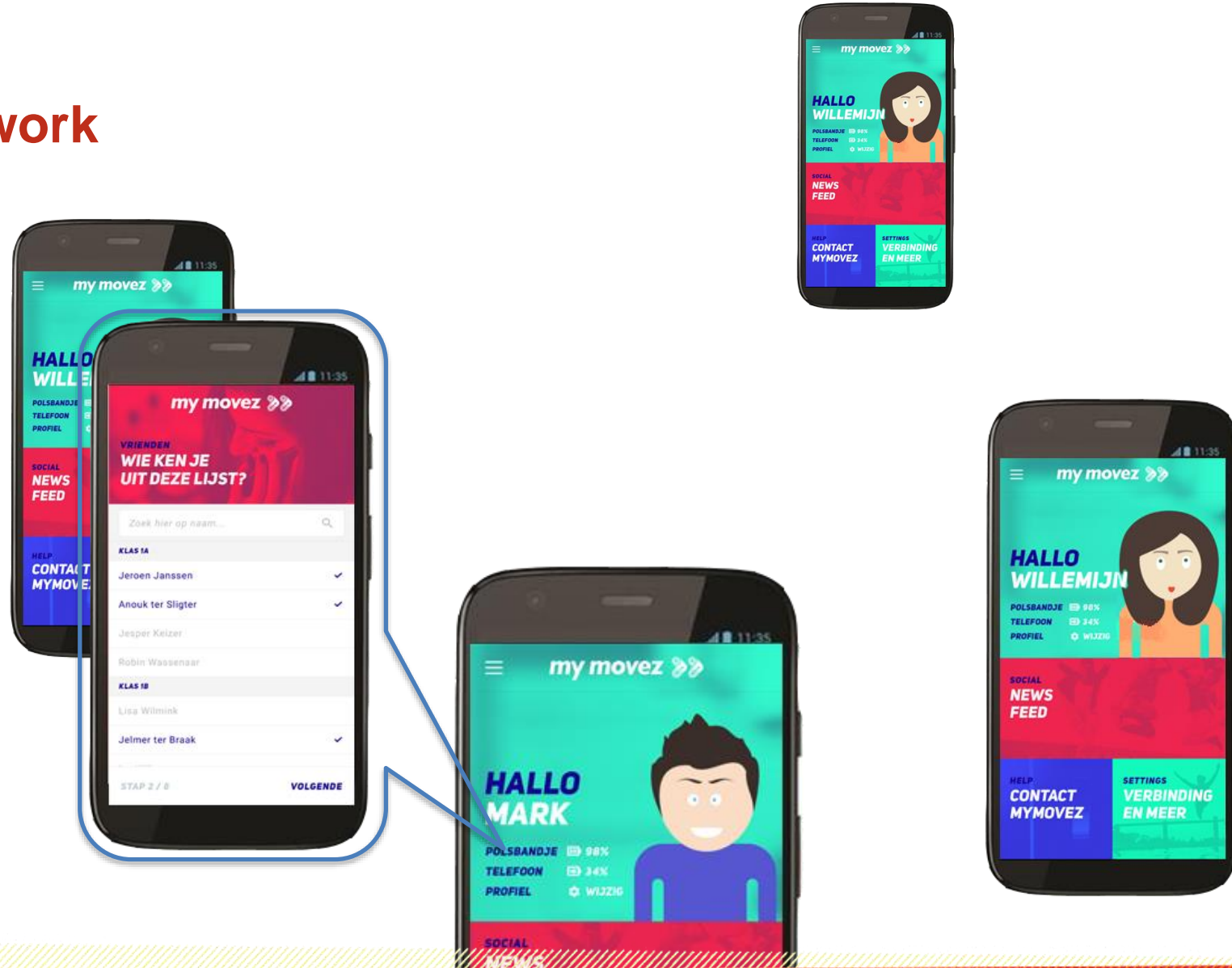




# Beacon network

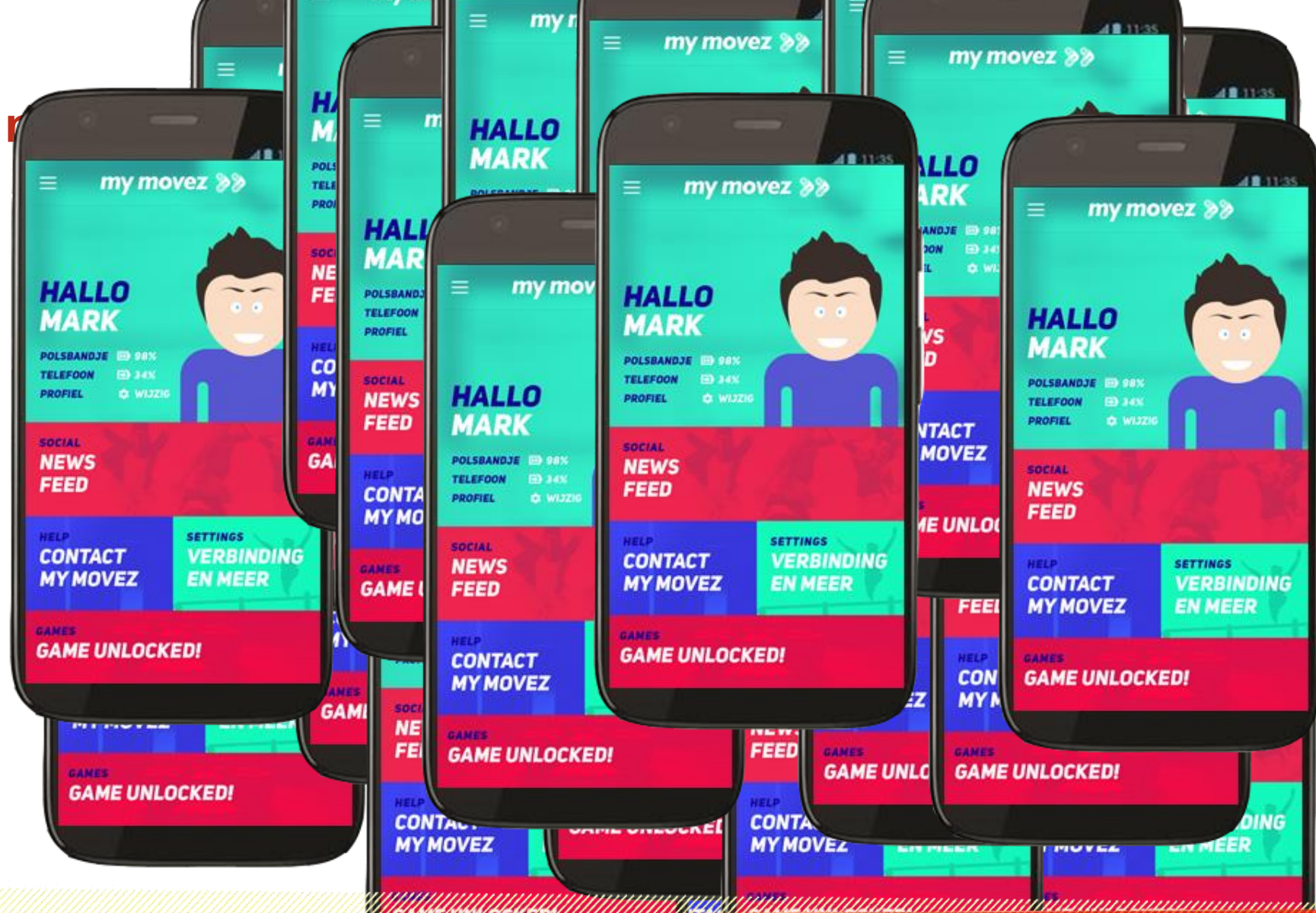


# Beacon network

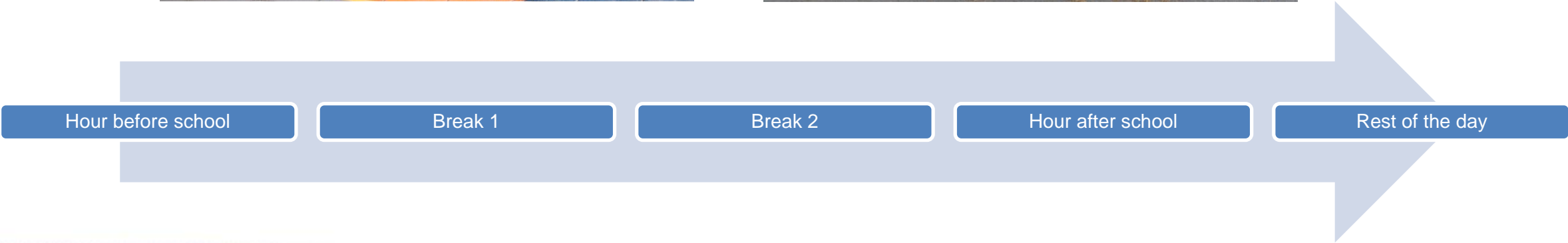




# Beacon r

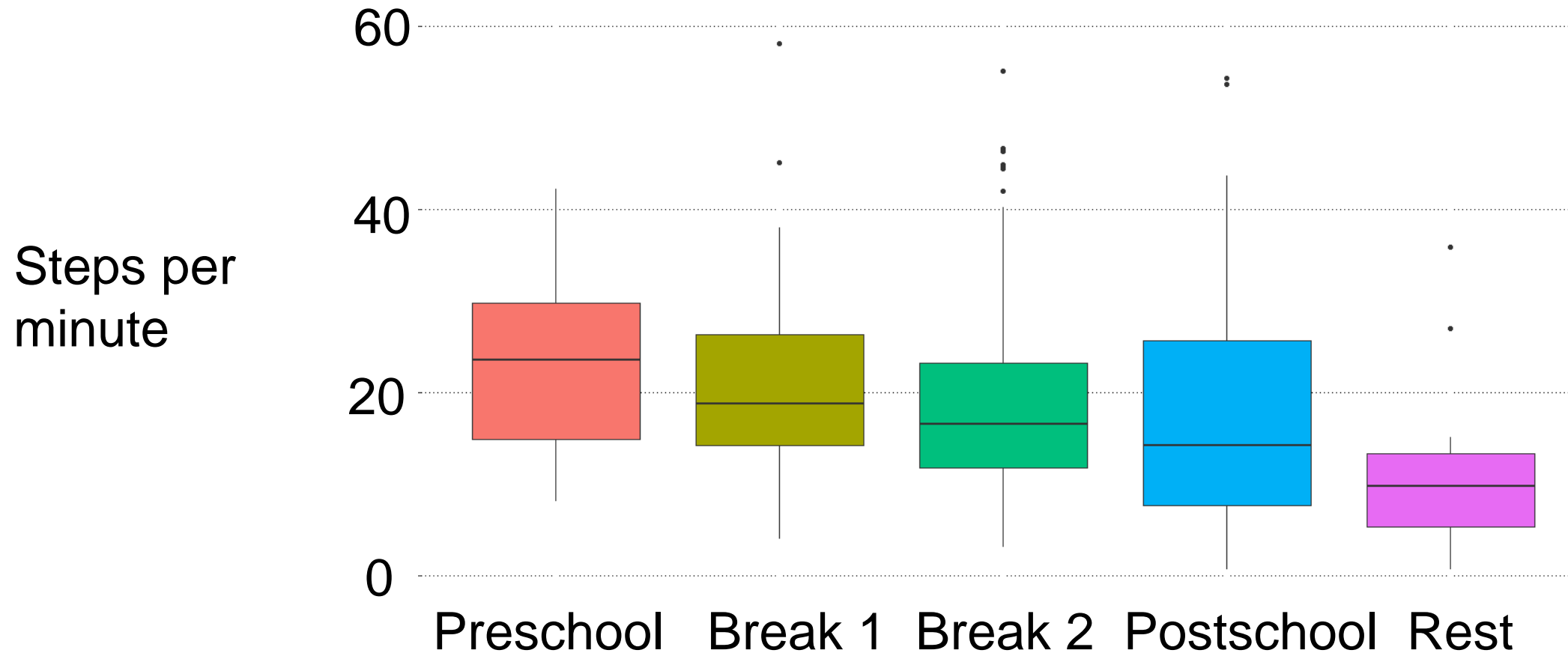


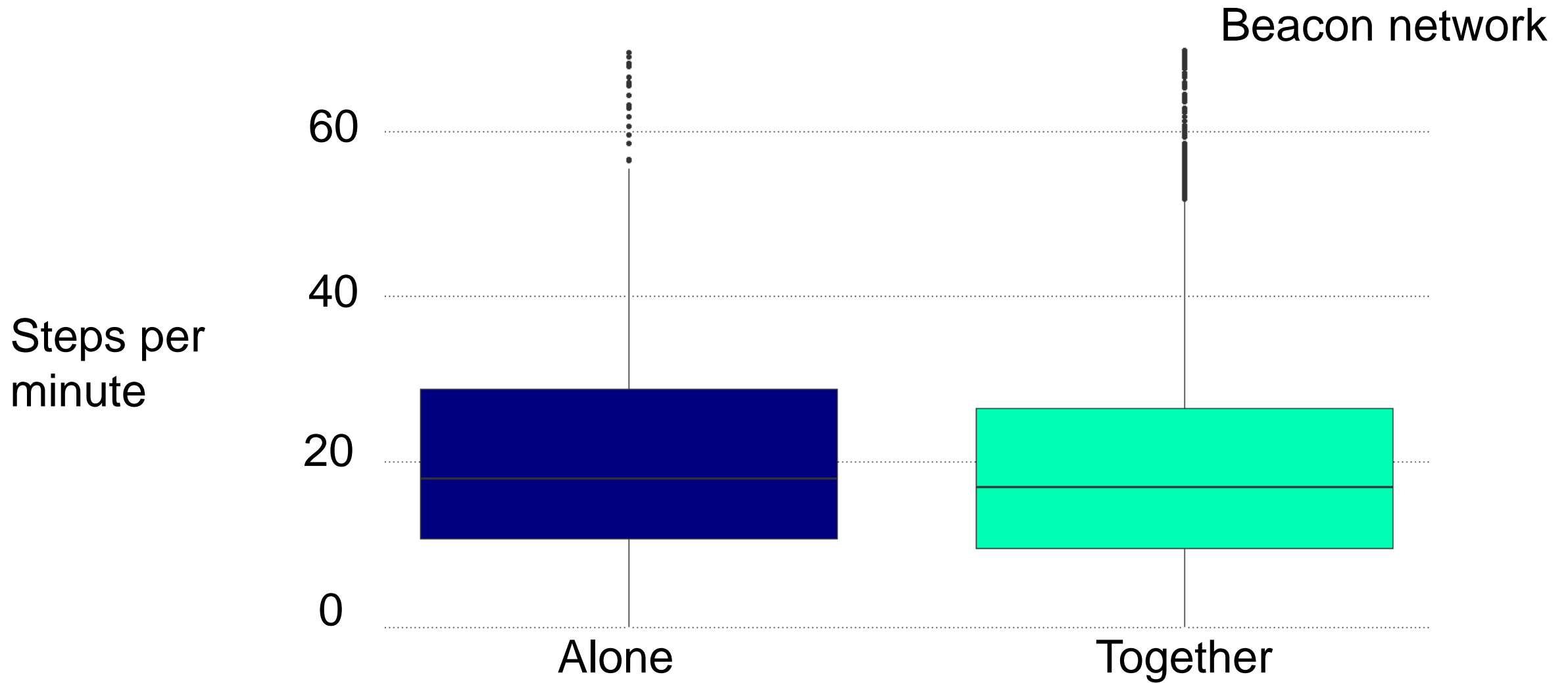
# Study 1: Together is more active?

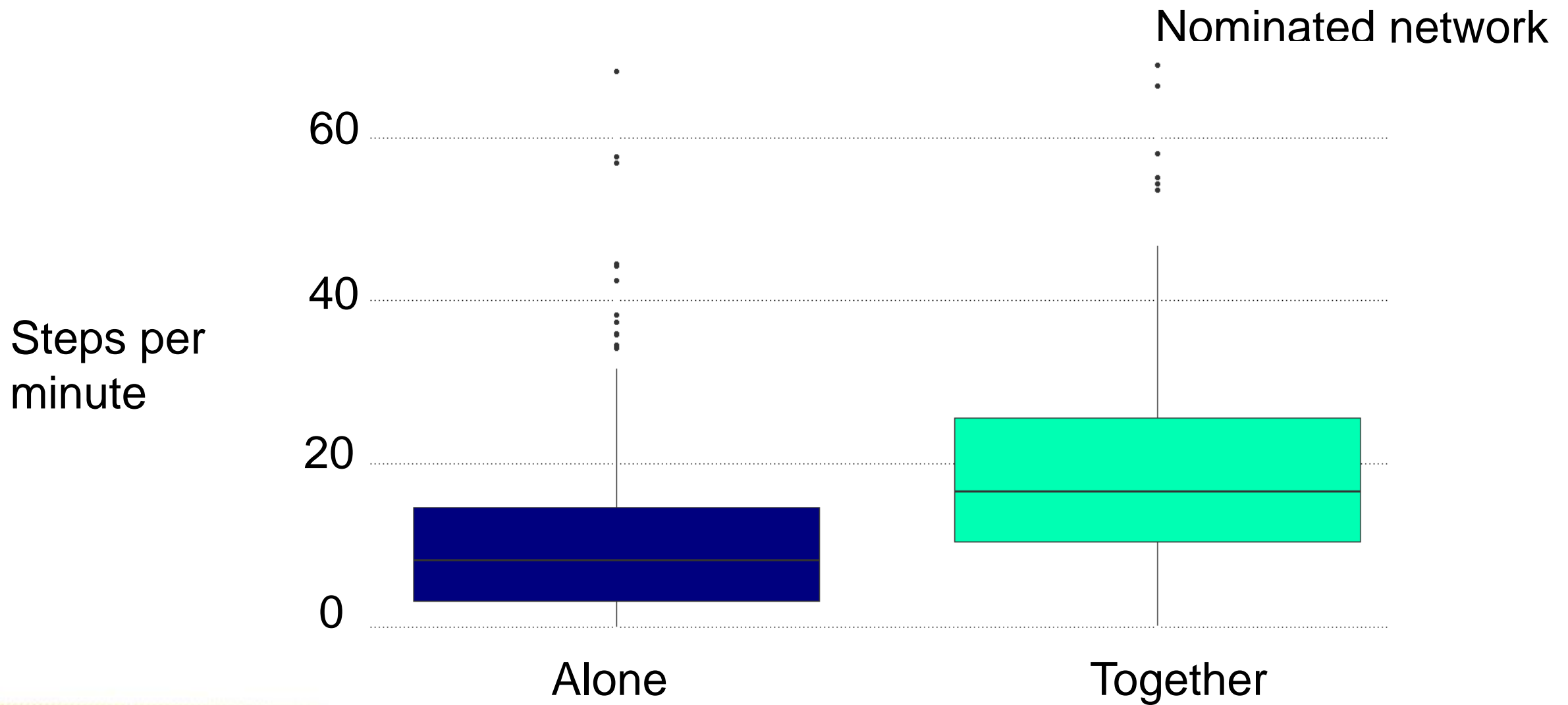




Time points

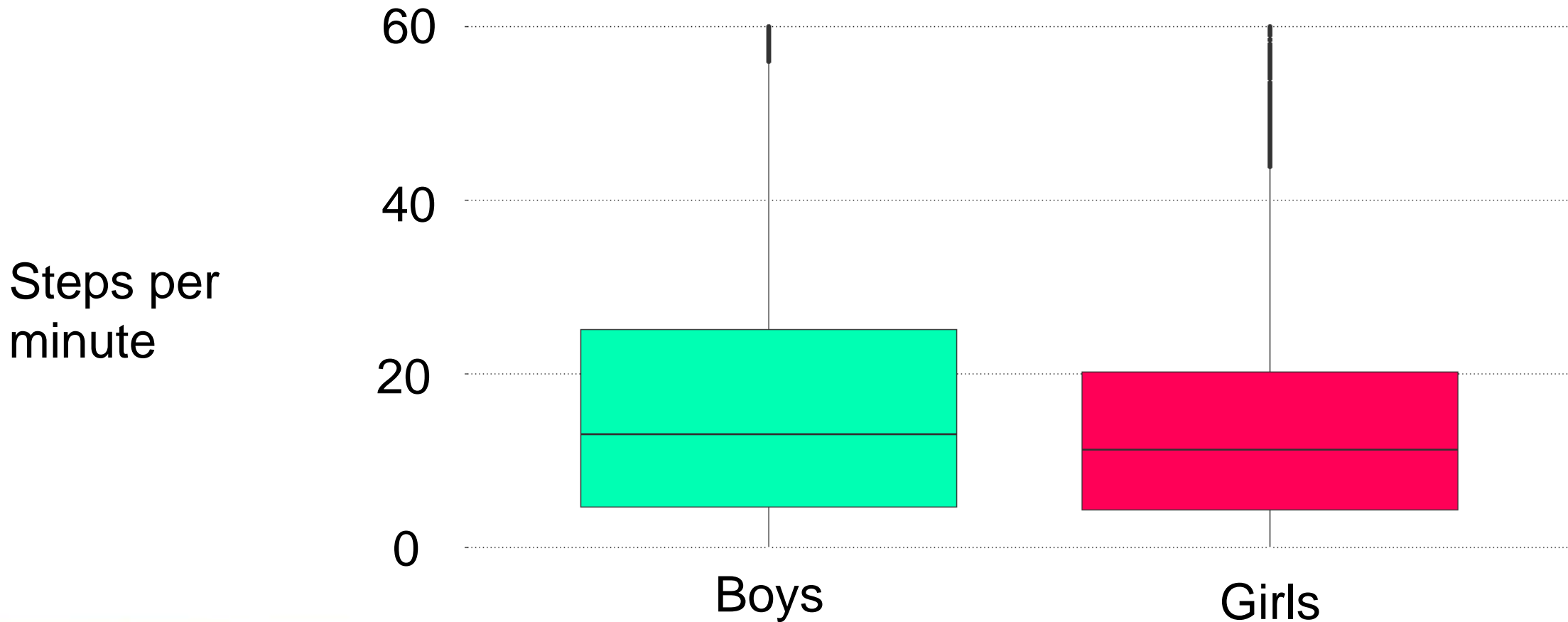






## Study 1: Together more active?

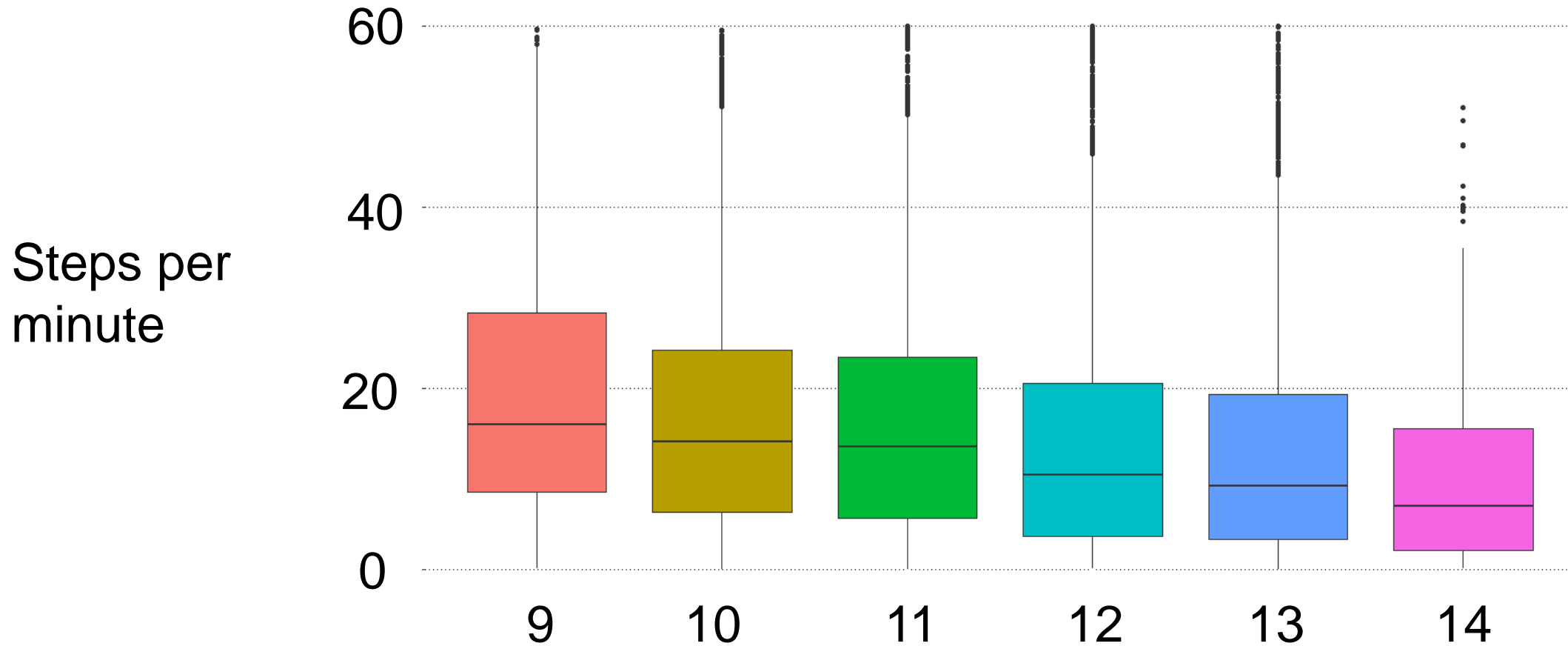
Sex





## Study 1: Together more active?

Age



## Study 1

- Youngsters are more active when they are together with classmates, but what about friends?
- And are the youngsters more active because they are together, or are they together because they are active?

## Study 2

- Social network approach
- Understand how similarity in physical activity among friends occurs

## Similarity in physical activity





## Selection



Do youngsters select friends based on physical activity levels?



	T1	T2	T3
Youngster A	Active	Active	Active
Youngster B	Moderate	Moderate	Moderate
Youngster C	Active	Active	Active

 friends

 non-friends



## Influence



Do youngsters select friends based on physical activity levels?

Do youngsters influence the amount of physical activity of friends?

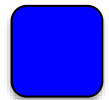
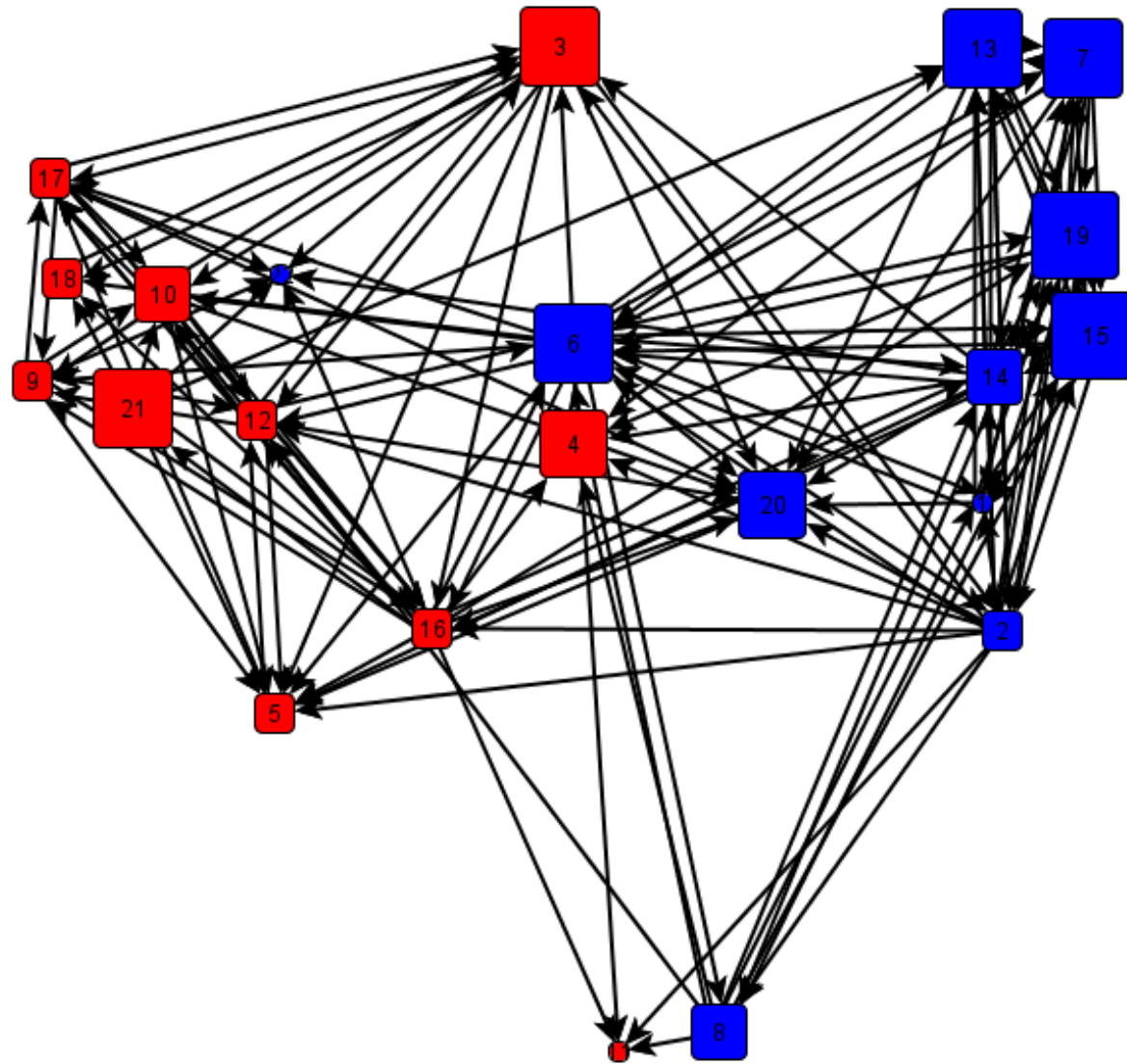


	T1	T2	T3
Youngster A	Active	Active	Active
Youngster B	Moderate	Active	Active
Youngster C	Moderate	Inactive	Inactive

 friends

 non-friends

# Friendship



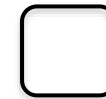
Boys



Girls



inactive

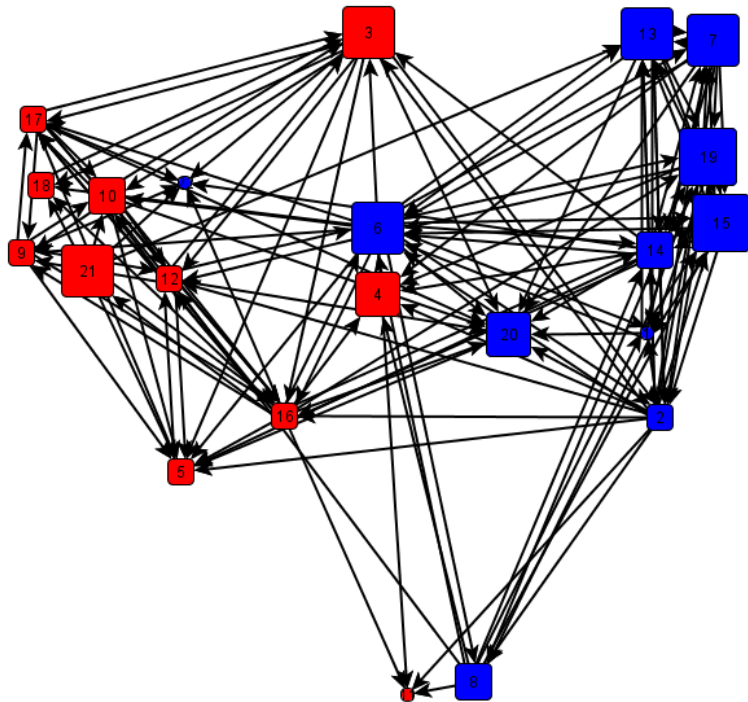


active

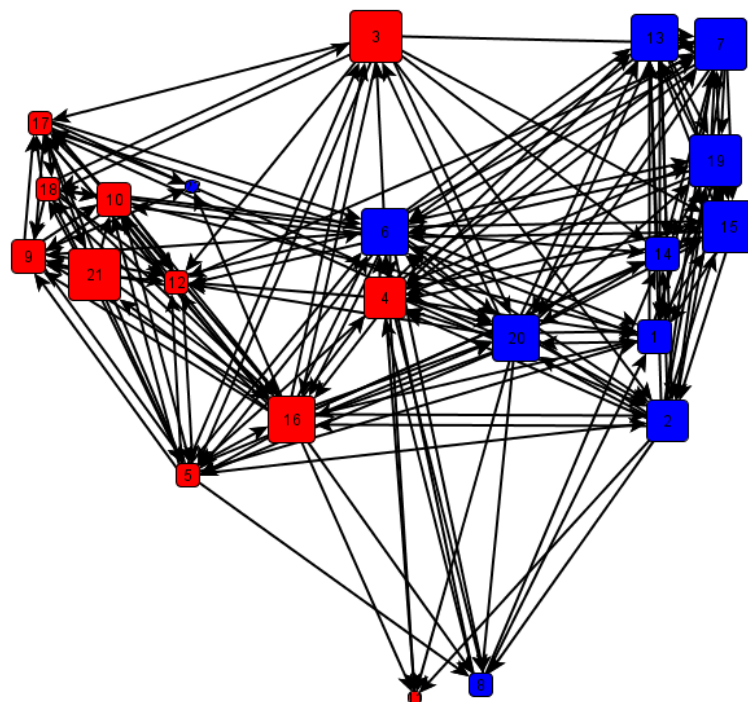


# Social network of a class over time

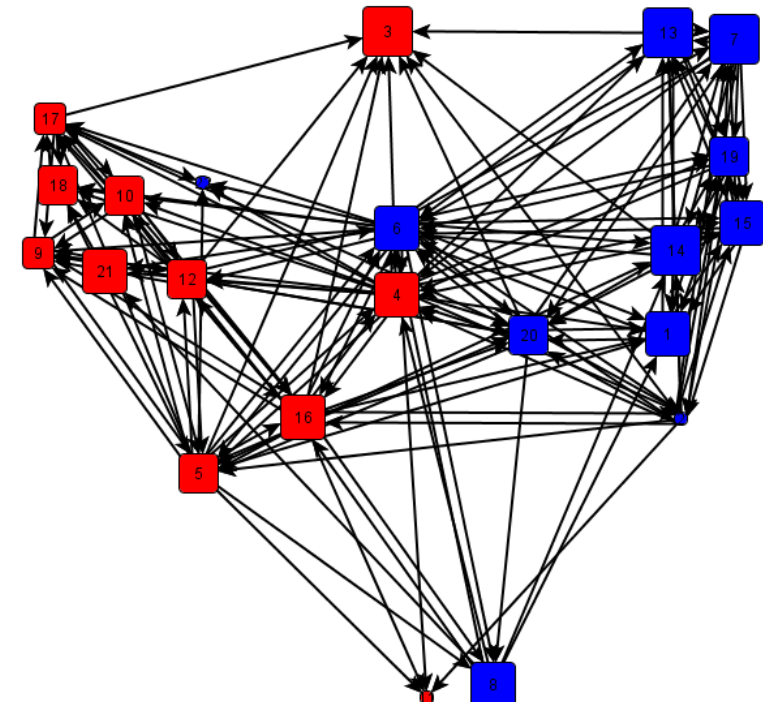
Wave 1



Wave 2



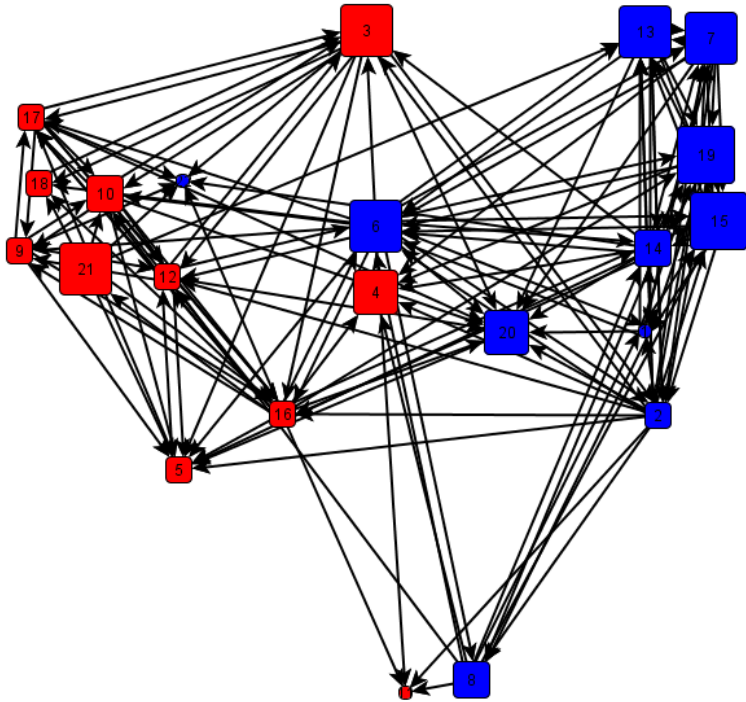
Wave 3



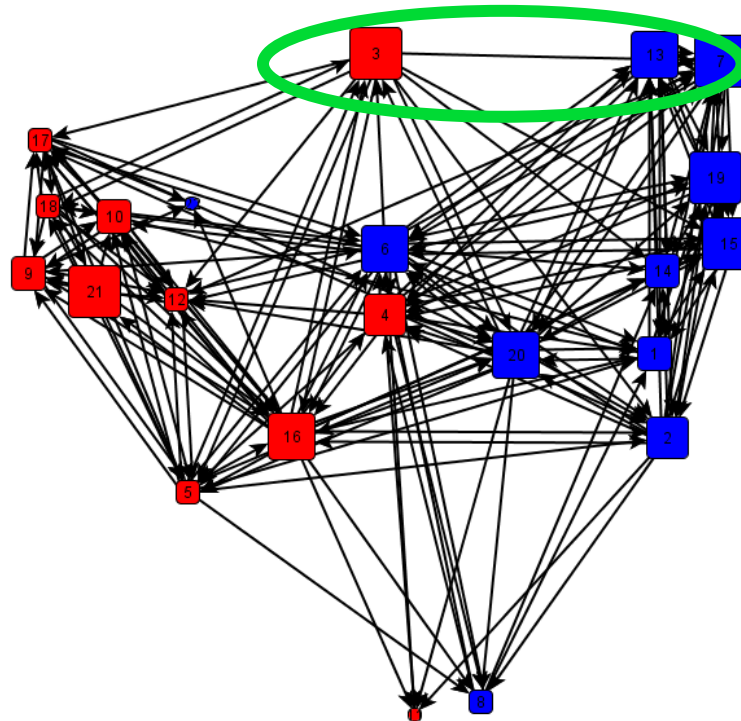


## Social network of a class over time

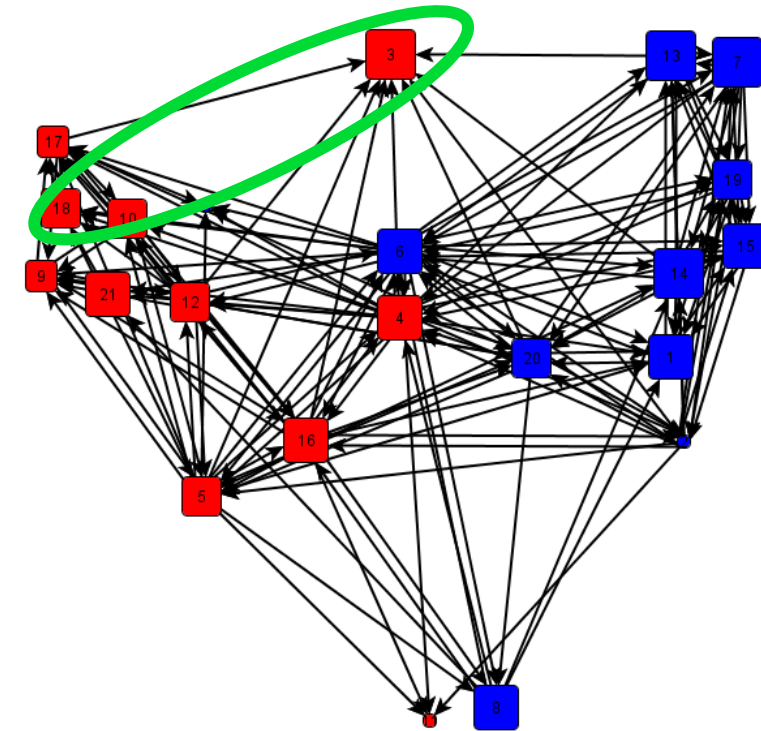
Wave 1



Wave 2

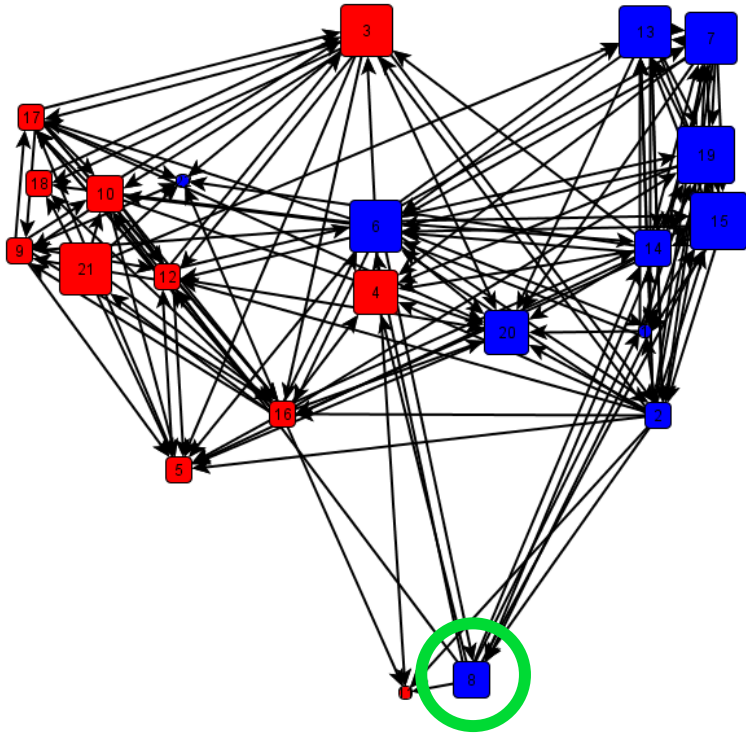


Wave 3

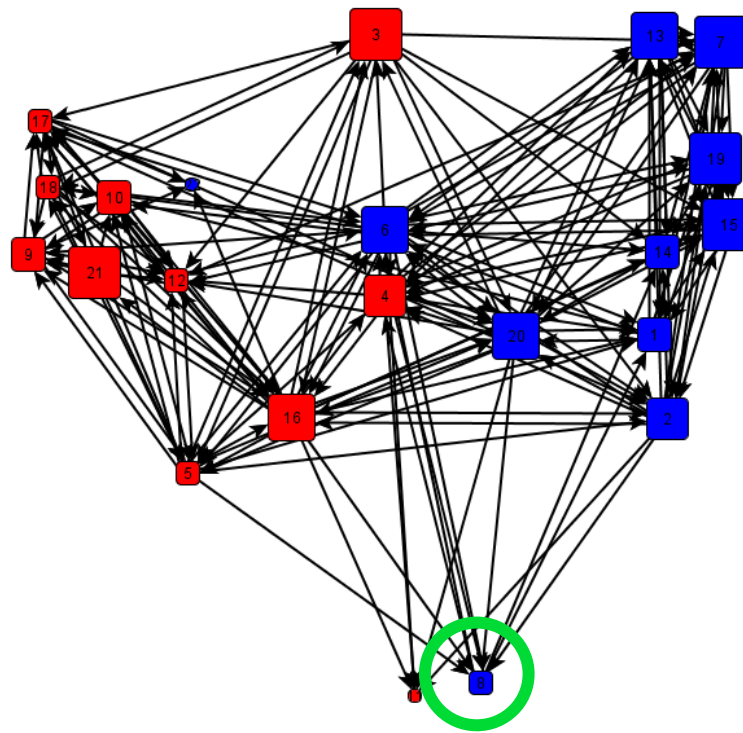


## Social network of a class over time

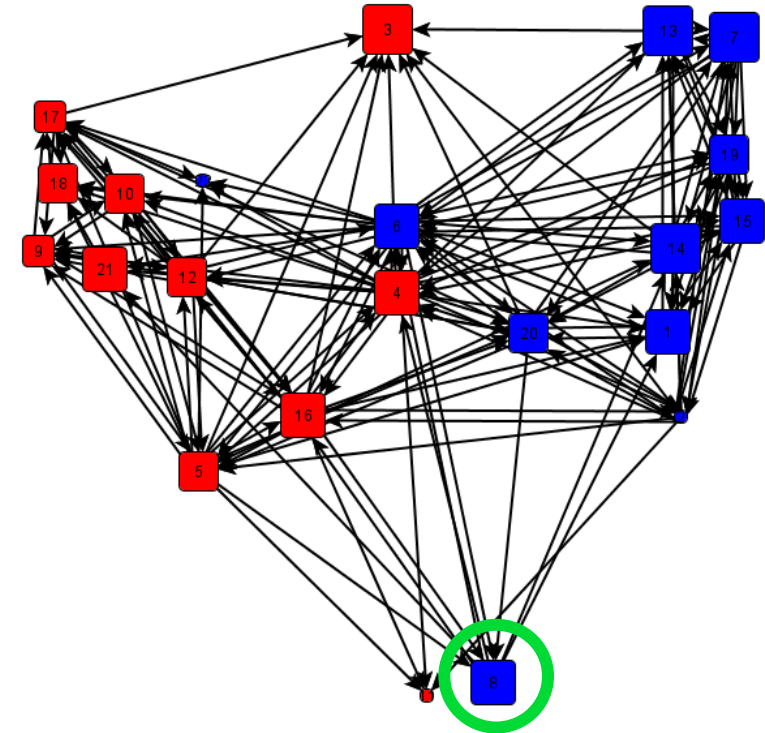
Wave 1



Wave 2



Wave 3





## Network effects

		<i>SE</i>	<i>t</i>	<i>p</i>
- outdegree (density)	-1.6205	(0.3644)	-4.4470	<.001
- reciprocity	0.9664	(0.1112)	8.6906	<.001
- transitive triplets	0.1900	(0.0187)	10.1604	<.001
- 3-cycles	-0.0670	(0.0333)	-2.0120	.044
- indegree - popularity (sqrt)	-0.2351	(0.0929)	-2.5307	.011
- outdegree - activity (sqrt)	0.3655	(0.1195)	3.0585	.002
- out-out degree <sup>(1/2)</sup> assortativity	-0.1169	(0.0435)	-2.6874	<.001
- Alter	-0.0112	(0.0465)	.2409	.809
- Ego	-0.1303	(0.0451)	2.8891	.004
- Similarity [Selection effect!]	0.7313	(0.3519)	2.0261	.042
- Same sex	0.7365	(0.0964)	7.6400	<.001

## Behavior effects

- Linear shape	0.1634	(0.0746)	2.1903	.029
- Quadratic shape	-0.0424	(0.0677)	-.6263	.53
- Total similarity [Influence effect!]	0.0302	(0.1348)	.2240	.82
- Effect from sex	-0.2420	(0.1391)	1.7398	.08



## Network effects

- Similarity	[Selection effect!]	0.7313	<i>SE</i> (0.3519)	<i>t</i> 2.0261	<i>p</i> .042
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## Behavior effects

- Total similarity	[Influence effect!]	0.0302	(0.1348)	.2240	.82
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## Study 2

- There is similarity within friends
- Without intervention, friends do not influence the physical activity of friends

## Study 3

- Pilot study: mobile social network intervention
- Based on the intervention by Crystal, but mobile



Appetite

Volume 103, 1 August 2016, Pages 294-301

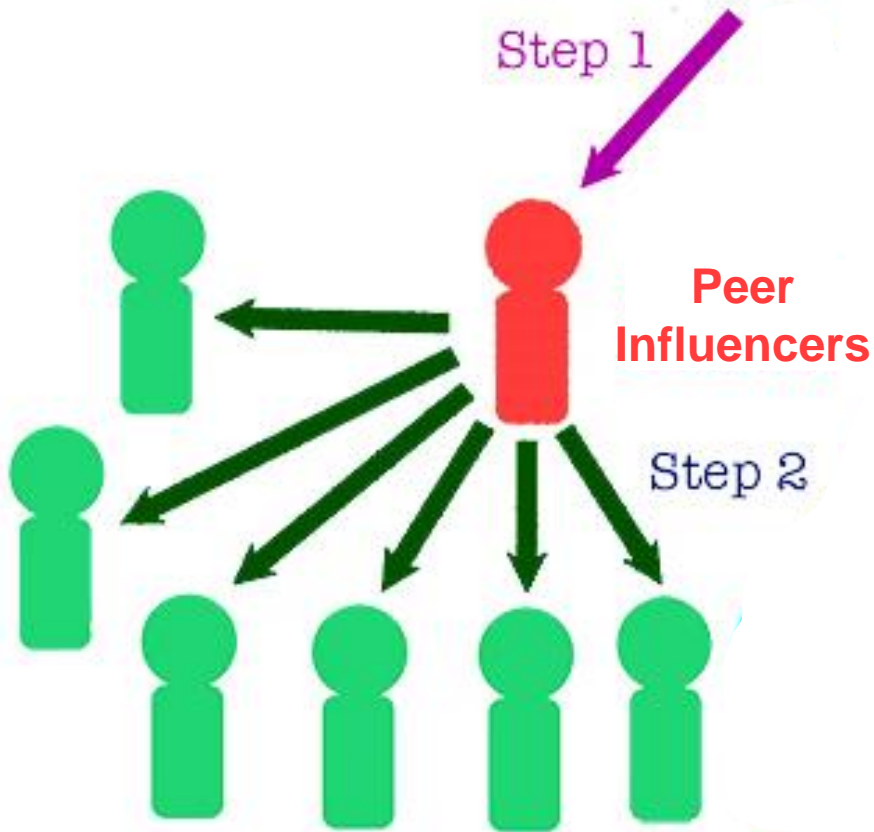


A social network-based intervention stimulating peer influence on children's self-reported water consumption: A randomized control trial

Crystal R. Smit<sup>a,\*</sup>, Rebecca N.H. de Leeuw, Kirsten E. Bevelander, William J. Burk, Moniek Buijzen



## Pilot study

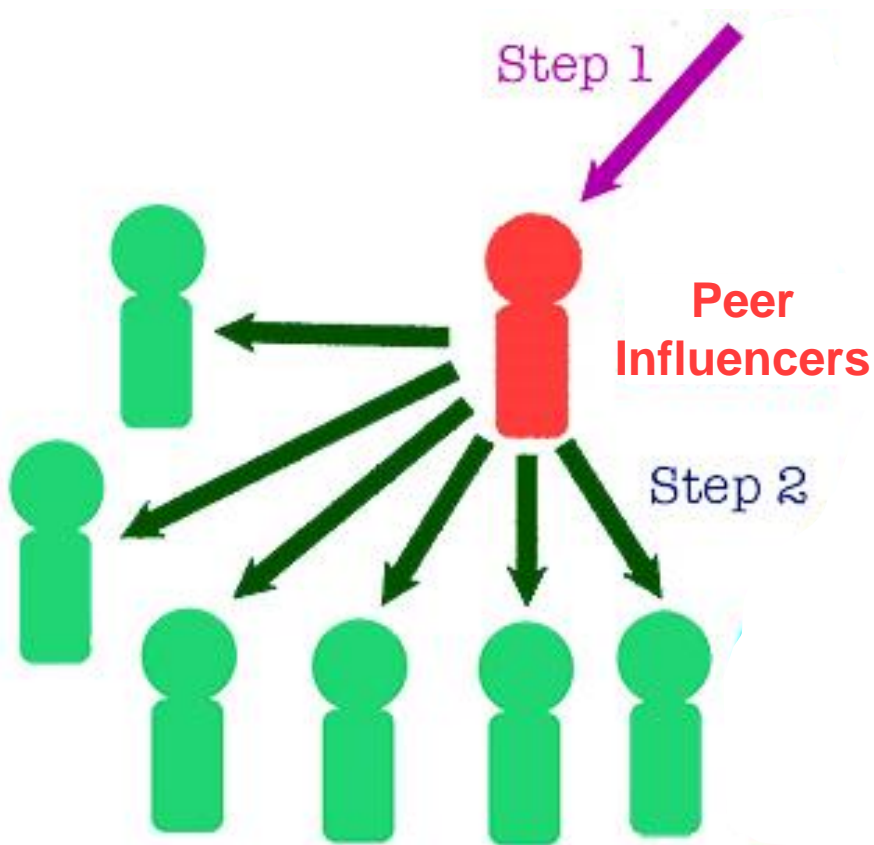


- One secondary school
  - 5 intervention classes
  - 6 control classes
- Baseline (Nov 2016)
  - assess network and determine PI's
- Intervention (Dec 2016)
  - Approach and train PI's at day 1
- 28 influencers: 15% per class (gender matched)



## Pilot study

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- Who to choose as a peer influencer?
  - Centrality
    - Indegree
    - Betweenness
    - **Closeness**
- How to persuade and train the peer influencers







Pretest to match the language of the target audience: Captains

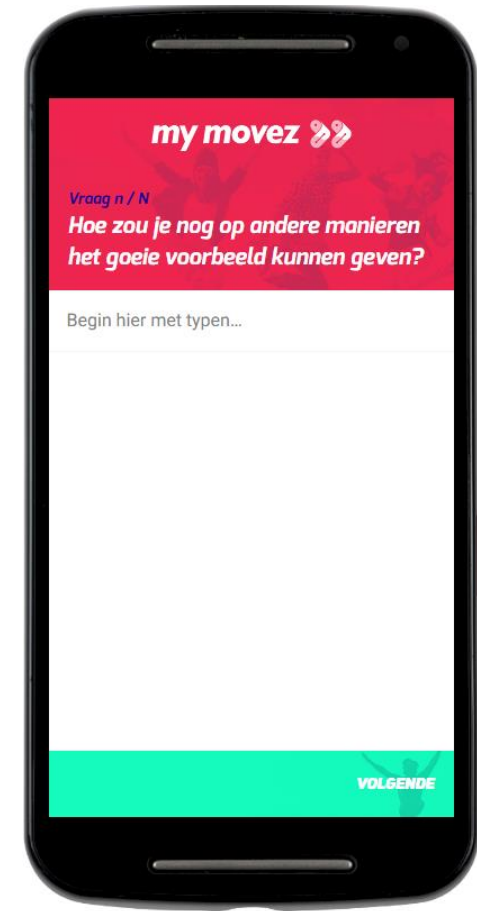
Provide information and fun facts to the peer influencers





Train the peer influencer how (s)he can influence the physical activity of friends

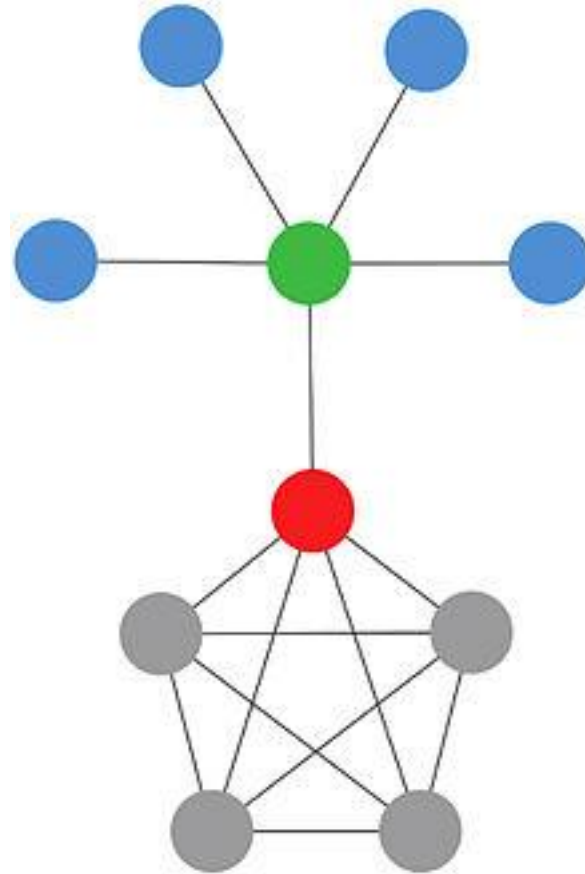
Ask for their personal strategies and preferences  
[Self determination]



Create commitment  
by asking whether  
they accept the role  
of team captain







November → December





## Take home message

- When youngsters are together with classmates, they are more physically active than when they are alone.
- There is similarity in physical activity of friends, caused by selection effects.
- We still have a lot of work to do!



## Contact information

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