Network impact on adolescent perceived barriers to physical activity

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Introduction

- 80% of adolescents world-wide do not meet daily physical activity (PA) recommendations
- Perceived barriers to PA (e.g., not having time for PA) reduce the odds of adolescents meeting recommendations
- Peer groups and interactions with others significantly affect adolescent PA

Objective

Analyze how perceived barriers are distributed throughout an adolescent friendship network and how these barriers may impact objective PA measures

Methods

Sample

381 Adolescents from 12 schools

M=10.77 years

SD=1.30 years

51.4% male

Measures

Accelerometer MVPA and Steps per day

Barriers to PA subscales: body, social, resource, convenience, and fitness

Nominated friends

Analysis

Linear Network Autocorrelation Modeling

1. Autocorrelation of Barriers
2. Control for network effects

Results

Linear network autocorrelation network statistics for barrier subscale scores

	Estimate	Std. Error	p-value
Body	0.02	<0.01	<.01*
Convenience	0.00	0.01	.74
Resource	0.01	0.01	.11
Social	0.01	<0.01	.02*
Fitness	0.01	0.01	.24

Note: Models were controlled for school, class, age, and sex; *= significant at p<.05

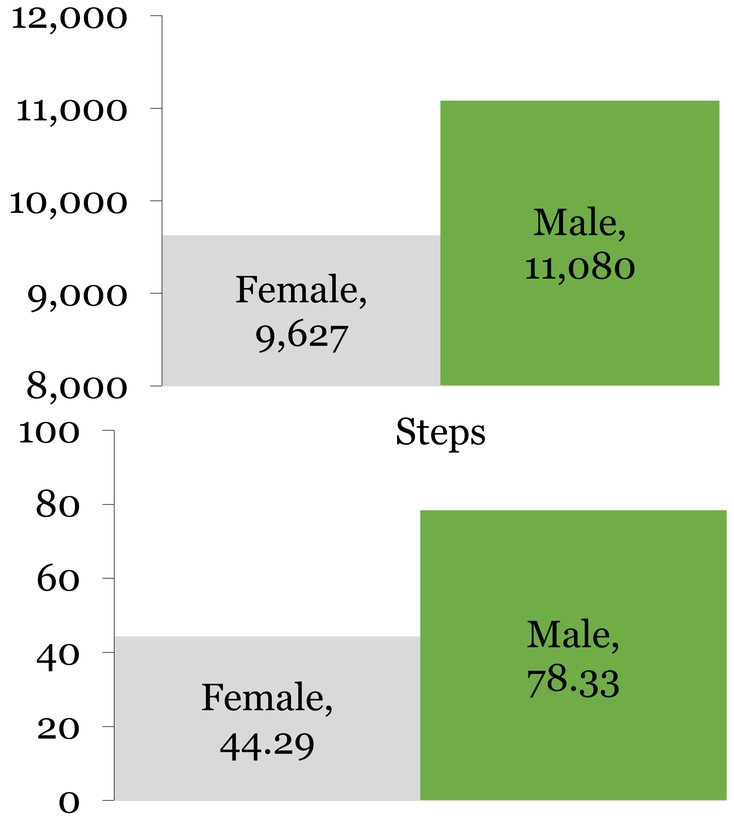
Adolescent body and social barrier subscale scores were significantly associated with those of their friends, exhibiting network effects

Social barrier subscale scores were significantly associated with more steps per day but not MVPA

Fitness barrier subscale scores were significantly associated with less steps per day but not MVPA

Network effects were significant in both models, meaning adolescent activity level was associated with the activity level of their friends

Male adolescents attained more steps and minutes of MVPA per day on average



Linear network autocorrelation models for objective PA measures

	MVPA Minutes per day			Steps per day		
	Estimate	Std. Error	p-value	Estimate	Std. Error	p-value
Control variables						
Age	1.99	1.44	.17	499.55	125.45	<.01*
Sex	-29.55	4.57	<.01*	-1,562.77	393.63	<.01*
Barriers						
Body	0.19	2.48	.94	-255.44	213.76	.23
Convenience	4.74	2.98	.11	42.96	257.45	.87
Resource	-3.89	4.24	.36	143.93	366.61	.69
Social	5.69	4.50	.21	1,019.35	389.39	.01*
Fitness	-5.04	4.33	.24	-1,228.29	373.58	.01*
Network effects	0.02	0.01	<.01*	0.02	0.004	<.01*

Note: Models were controlled for school and class; *= significant at p<.05

Conclusion

Adolescents' perceived PA barriers are significantly associated with social connections

Researchers and practitioners aiming to reduce barriers may wish to assess peer reinforcing effects, particularly those related to social and body barriers