With a Little Help from My Friends: Momentary Social Structure, Function, and Quality as Drivers of Adolescent Physical Activity in the Summer



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Introduction

- Fewer than 25% of adolescents meet moderate-to-vigorous physical activity (MVPA) guidelines.
- Social connection is a key health determinant with three dimensions: structure (who is around), function (what they do, such as inviting you to be active), and quality (how close the ties feel); with momentary links to adolescent PA unclear.
- Summer, without school structure, can be a difficult time for adolescent PA and social connection.

Methods

40 adolescents (mean age = 12.8 years, SD = 0.9; 75% male) completed up to six random-prompt ecological momentary assessment (EMA) surveys daily for seven days during summer 2025.

EMA surveys assessed momentary social structure, function, and quality, while baseline social network surveys measured broader social connections and wrist-worn accelerometers recorded MVPA.

Multilevel models analyzed 1,352 EMA observations nested within 40 participants, with predictors person-mean centered to distinguish within-person and between-person effects.

Objective: Evaluate associations between cross-sectional and momentary social structure, function, and quality and MVPA within 60 minutes of EMA prompt.

Results

Table 1: Participant Characteristics (N = 40)

Variable	n (%) / M (SD)
Age (years)	12.78 (0.86)
Male	30 (75.0%)
Grade 6 / 7 / 8	13 / 17 / 10
Race: White	23 (57.5%)
Race: Black or African American	4 (10.0%)
Race: Multiracial	2 (5.0%)
Race: Other	11 (27.5%)
Hispanic or Latino	14 (35.0%)
EMA prompts answered	34.67 (5.06)
EMA completion rate (%)	82.56 (12.05)
Network size (# of alters)	7.05 (2.26)
Prompts reported alone	499 (36.9%)
Daily MVPA (min/day)	37.25 (17.85)

Mean Daily MVPA

37·3

min/day

(SD = 17.9)

Range 10.6-77.8

Table 2: Multilevel Models Predicting Post-Prompt MVPA

Predictor	Model A: Structure		Model B: Function + Quality	
	β (SE)	p	β (SE)	p
Intercept	1.06 (0.11)	**<.001**	1.14 (0.12)	**<.001**
Within-Person (Momentary EMA)				
Alone (vs. with others)	-0.12 (0.04)	**.007**		
Social susceptibility			0.08 (0.02)	**<.001**
PA norms			-0.01 (0.03)	.69
Emotional closeness			-0.03 (0.03)	.25
Between-Person (Baseline Network)				
Proportion of prompts alone	-0.08 (0.18)	.67		
Network size	0.07 (0.02)	**<.001**		
Network PA norms	0.12 (0.09)	.17	0.24 (0.13)	.06
Network closeness			-0.03 (0.07)	.69
Covariates				
Age (years)	0.06 (0.05)	.26	0.11 (0.07)	.09
Sex (male)	-0.13 (0.10)	.18	-0.26 (0.13)	**.045**

Note. Outcome = log(MVPA min + 1) in the 60 min after each prompt. Model A: all prompts (1,352 prompts, 40 youth); Model B: prompts with others present (853 prompts, 40 youth). Within-person predictors person-mean centered; network predictors grand-mean centered. Both models adjust for study day. Bold = p < .05.

STRUCTURE

Being alone was associated with lower MVPA, while larger social networks were associated with higher MVPA.

Alone: β = -0.12, p = .007
Network size: β = 0.07, p < .001

FUNCTION

Greater willingness to join physical activity suggested by others was associated with higher subsequent MVPA.

Social susceptibility: β = 0.08, p < .001

QUALITY

Emotional closeness and perceived physical activity norms were not significantly associated with MVPA.

Closeness: β = -0.03, p = .25
PA norms: β = -0.01, p = .69

Conclusions

Both immediate social context and broader social network structure may facilitate MVPA.

More peers or others may indicate more opportunities for co-participation in physical activity.

Leveraging peer influence within existing social networks may help promote adolescent physical activity.

Just-in-time interventions may want to leverage times adolescents are open to physical activity suggestions.