

Dou, K. et al.: How cumulative family risks influence the trajectory of problematic social media use among Chinese adolescents: A three-year longitudinal study

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Supplementary materials

Table S1. Model fit indices and intercept and slope statistics for the latent growth curve models with the complete group

Model	$X^2(df)$	p	CFI	RMSEA (90% CI)	BIC	SRMR
Model 1	13.43 (5)	.020	0.992	0.044 ([0.016, 0.073])	7888.385	0.023
Model 2	2.25 (1)	.133	0.999	0.038 ([0.000, 0.106])	7904.332	0.008
Model 3	16.96 (8)	.031	0.993	0.036 ([0.010, 0.059])	7851.442	0.013
Model 4	32.48 (16)	.009	0.990	0.034 ([0.017, 0.051])	13822.35	0.014

Note: The sample size after listwise deletion is 879. Unstandardized regression coefficients are reported. Model 1 = the unconditional linear latent growth model, Model 2 = the unconditional quadratic latent growth model, Model 3 = the conditional latent growth model with cumulative family risks at Time 1 as the predictor, sex, age, residence, the only child status, and parents' educational levels as covariates, Model 4 = the conditional latent growth model with cumulative family risks at Time 1 as the independent variable, escape and relationship motivations at Time 2 as mediators, sex, age, residence, the only child status, and parents' educational levels as covariates. Abbreviations: χ^2 = chi-square statistic, df = degrees of freedom, CFI = Comparative fit index, RMSEA = Root mean square error of approximation, 90% CI = 90% Confidence interval, BIC = Bayesian information criteria, SRMR = Standardized root mean square residual. I = Intercept, S = Slope. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table S2. Intercept and slope statistics of the latent growth curve models

Model	Means						Variances					
	I	<i>p</i> (95% CI)	S ₁	<i>p</i> (95% CI)	S ₂	<i>p</i> (95% CI)	I	<i>p</i> (95% CI)	S ₁	<i>p</i> (95% CI)	S ₂	<i>p</i> (95% CI)
1	1.33	< .001 ([1.270, 1.378])	−0.01	.276 ([−0.019, 0.006])	–	–	0.50	< .001 ([0.435, 0.559])	0.01	< .001 ([0.004, 0.014])	–	–
2	1.33	< .001 ([1.271, 1.383])	−0.02	.437 ([−0.055, 0.024])	0.002	.635 ([−0.006, 0.010])	0.54	< .001 ([0.455, 0.621])	0.09	.007 ([0.025, 0.163])	0.003	.052 ([0.000, 0.006])
3	−1.46	< .001 ([−2.236, −0.687])	0.25	.423 ([−0.368, 0.856])	−0.02	.776 ([−0.132, 0.101])	0.43	< .001 ([0.355, 0.519])	0.08	.030 ([0.014, 0.149])	0.002	.076 ([0.000, 0.005])
4	−1.55	< .001 ([−2.208, −0.894])	0.26	.021 ([0.034, 0.477])	−0.02	.210 ([−0.046, 0.010])	0.34	< .001 ([0.271, 0.420])	0.09	.005 ([0.033, 0.161])	0.003	.051 ([0.000, 0.006])

Note: The sample size after listwise deletion is 879. Unstandardized regression coefficients are reported. **Model 1 = the unconditional linear latent growth model, Model 2 = the unconditional quadratic latent growth model, Model 3 = the conditional latent growth model with cumulative family risks at Time 1 as the predictor, sex, age, residence, the only child status, and parents' educational levels as covariates, Model 4 = the conditional latent growth model with cumulative family risks at Time 1 as the independent variable, escape and relationship motivations at Time 2 as mediators, sex, age, residence, the only child status, and parents' educational levels as covariates.** Abbreviations: I = Intercept, S₁ = Linear slope, S₂ = Quadratic slope.

Table S3. The direct and indirect pathways from the cumulative family risks at Time 1 to the trajectory of PSMU with the complete group

Pathway	Unstandardized estimates	Standardized estimates	<i>SE</i>	<i>p</i>	95% CI
T1 CFR→PSMU intercept	0.11	0.12	0.03	.001	[0.044, 0.172]
T1 CFR→PSMU linear slope	0.04	0.10	0.02	.119	[-0.011, 0.084]
T1 CFR→PSMU quadratic slope	-0.01	-0.12	0.01	.104	[-0.017, 0.002]
T1 CFR→T2 EM→PSMU intercept	0.09	0.11	0.02	< .001	[0.064, 0.127]
T1 CFR→T2 EM→PSMU linear slope	-0.02	-0.06	0.01	.004	[-0.037, -0.008]
T1 CFR→T2 EM→PSMU quadratic slope	0.003	0.04	0.001	.053	[0.000, 0.005]
T1 CFR→T2 RM→PSMU intercept	0.01	0.01	0.004	.167	[0.000, 0.016]
T1 CFR→T2 RM→PSMU linear slope	-0.001	-0.001	0.002	.758	[-0.006, 0.002]
T1 CFR→T2 RM→PSMU quadratic slope	0.000	0.000	0.000	.976	[-0.001, 0.001]

Note: The sample size after listwise deletion is 879. *SE* = Standard error. T1 = Time 1, T2 = Time 2. CFR = Cumulative family risks, EM = Escape motivation, RM = Relationship motivation, PSMU = Problematic social media use. The significant results are in bold.

Scale Description

(1) Interparental Conflict Scale

Introductions: There are times when parents are at odds with each other in every family. The following sentences describe the situation when your parents quarrel or disagree. Please choose the degree that suits you according to your first feeling and circle it. There is no right or wrong answer. Please answer according to the first feeling.

Items	Completely false	A little false	Not sure	A little true	Completely true
1.My parents get mad when they argue.	1	2	3	4	5
2.When my parents have an argument, they say mean things to each other.	1	2	3	4	5
3.When my parents have an argument, they yell at each other.	1	2	3	4	5
4.My parents have broken or thrown things during an argument.	1	2	3	4	5
5.My parents have pushed or shoved each other during an argument.	1	2	3	4	5

(2) Alabama Parenting Questionnaire

Instructions: This questionnaire is about the way your parents raised you. Each question has five grades: 1, 2, 3, 4, 5. Please circle the number that best fits your father and your mother. You can only choose one answer per question. Your father and mother may have raised you the same way, or they may have raised you differently. Please answer truthfully.

Notes: If you are in a single parent (divorced) family, you can only answer the father or mother column. Here are some examples of how to answer each question. F = Father, M = Mother.

Items		Never	Seldom	Sometimes	Often	Always
1. When I do a task well, my parents let me know "You did a great job (or whatever it is)"	F	1	2	3	4	5
	M	1	2	3	4	5
2. My parents threatened to punish and then do not actually punish me	F	1	2	3	4	5
	M	1	2	3	4	5
3. I fails to leave a note or to let my parents know where I was going.	F	1	2	3	4	5
	M	1	2	3	4	5
5. I talk my parents out of being punished after me have done something wrong	F	1	2	3	4	5
	M	1	2	3	4	5
6. I stays out in the evening after the time I am supposed to be home	F	1	2	3	4	5
	M	1	2	3	4	5
7. My parents compliment me after I have done something well	F	1	2	3	4	5
	M	1	2	3	4	5
8. My parents will praise me if I behave well	F	1	2	3	4	5
	M	1	2	3	4	5
9. I am out with friends my parents don't know	F	1	2	3	4	5
	M	1	2	3	4	5
10. My parents let me out of a punishment early (like lift restrictions earlier than my parents originally said)	F	1	2	3	4	5
	M	1	2	3	4	5

(3) Parental Psychological Control Scale

Introductions: Here are some statements about parents. Please read each question carefully and choose a circle from "1" to "5" according to your actual situation or ideas. You can only choose one answer for each question. Please do not choose more than one answer or omit one answer.

Items	Never	Seldom	Sometimes	Often	Always
1.My parents always want to change my thoughts.	1	2	3	4	5
2.My parents think that their thoughts are more important than my thoughts.	1	2	3	4	5
3.During our conversation, my parents always dominate the conversation and want me to follow their views.	1	2	3	4	5
4.My parents always blame me for the problems encountered by my family.	1	2	3	4	5
5.When my parents criticize me, they always mention my past mistakes.	1	2	3	4	5
6.When my views are different from those of my parents, they reduce their friendliness to me.	1	2	3	4	5
7.When I disappoint my parents, they stop talking to me.	1	2	3	4	5
8.When I make my parents unhappy, they stop talking to me until I please them again.	1	2	3	4	5
9.My parents want to control everything in my life.	1	2	3	4	5
10.My parents always want to change me to fit their standards.	1	2	3	4	5

(4) Motivations for internet (mobile phones) use scale

Introductions: We want to know why you are using Internet (mobile phones). Please indicate how strongly you agree with each of the following reasons.

Items	Strongly disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly agree
1.I use Internet (mobile phones) to feel less lonely	1	2	3	4	5	6	7
2.I use Internet (mobile phones) to fill uncomfortable silence	1	2	3	4	5	6	7
3.I use Internet (mobile phones) to make myself feel better when I feel down	1	2	3	4	5	6	7
4.I use mobile phones to forget about school work or work	1	2	3	4	5	6	7
5.I use Internet (mobile phones) to get away from others	1	2	3	4	5	6	7
6.I use Internet (mobile phones) to forget about worries and concerns	1	2	3	4	5	6	7
7.I use Internet (mobile phones) to feel closer to family and friends	1	2	3	4	5	6	7
8.I use Internet (mobile phones) to improve relationships with friends and family	1	2	3	4	5	6	7
9.I use Internet (mobile phones) to let others know you care for them	1	2	3	4	5	6	7

(5) Problematic Social Media Use Scale

Introductions: Below are some descriptions of your daily use of social software (such as WeChat, weibo, QQ, etc.). Please determine the frequency of these situations in your life based on your actual situation, and circle the corresponding number. The larger the number, the more common it is.

Items	Never	Rarely	Sometime	Often	Always
1.How frequently do you find it difficult to quit using social media?	0	1	2	3	4
2.How frequently do others (e.g., your parents or friends) tell you that you should spend less time on social media?	0	1	2	3	4
3.How frequently do you prefer using social media over spending time with others (e.g., with friends or family)?	0	1	2	3	4
4.How frequently do you feel restless, frustrated, or irritated when you can't access social media?	0	1	2	3	4
5.How frequently do you do your homework poorly because you prefer being on social media?	0	1	2	3	4
6.How frequently do you use social media because you feel unhappy?	0	1	2	3	4
7.How frequently do you lack sleep because you spent the night using social media?	0	1	2	3	4