The Impact of Social Exclusion on Light Social Interaction Among College Students: The Chain Mediating Effects of Algorithmic Perception and Social Distance

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Abstract: *Purpose:* This study aims to examine the impact of social exclusion on light social interaction among college students and to investigate the chain-mediating roles of algorithmic perception and social distance. *Method:* A questionnaire survey was conducted among 370 college students using the Social Exclusion Questionnaire, the Light Social Interaction Scale, the Algorithmic Perception Scale, and the Social Distance Scale. *Results:* (1) Social exclusion positively predicted light social interaction. (2) Algorithmic perception and social distance respectively mediated the relationship between social exclusion and light social interaction. (3) Algorithmic perception and social distance played a chain-mediating role between social exclusion and light social interaction. *Conclusion:* Social exclusion can not only directly affect college students' light social interaction but also indirectly influence it by reducing algorithmic perception and increasing social distance.

Keywords: Social Exclusion; Light Social Interaction; Algorithmic Perception; Social Distance; Chain Mediation; College Students

1. Introduction

In the digital era, a "light social interaction" model (e.g., buddy socializing), characterized by relaxed experience, simplified relationships, and straightforward meaning, is prevalent among college students [1]. Existing research identifies social exclusion as a key stressor prompting individuals to alter their social strategies [2], yet how it drives a shift toward light social interactions via algorithms—and the underlying pathways—remains unclear. Specifically, the potential chain mediation involving algorithmic perception (a core environmental variable) and social distance (a key psychological state) is underexplored. Therefore, this study builds a chain mediation model to systematically examine the pathway from social exclusion to light social interaction via algorithmic perception and social distance.

Social exclusion may directly drive light social interaction. According to the Need to Belong theory, social exclusion frustrates individuals' fundamental need for connection, eliciting emotional distress and fear of rejection. To cope, they adopt a defensive strategy: seeking interactions with controllable risks, limited responsibility, and minimal emotional

investment. Light social interaction offers this exact framework—an adaptive means to meet basic social needs while enabling self-protection. Hence, this study proposes Hypothesis 1 (H1): Social exclusion positively predicts college students' light social interaction.

In the digital context, intelligent algorithms profoundly shape social patterns. This study posits that the emotional exhaustion and strong compensatory belonging needs from social exclusion may reduce individuals' vigilance toward algorithmic manipulation. Consequently, individuals may unconsciously immerse themselves in the shallow, easily accessible connections precisely delivered by algorithms and rationalize this process. This reduced algorithmic perception reinforces reliance on the algorithm-mediated, light social frameworks. Thus, this study proposes Hypothesis 2 (H2): Algorithmic perception mediates the relationship between social exclusion and light social interaction, where exclusion promotes such interaction by reducing perception.

Social exclusion may also indirectly influence social interaction by altering interpersonal psychological distance. To cope with the harm caused by exclusion, individuals may proactively distance themselves cognitively and emotionally, manifesting greater social distance. This "distancing" tendency aligns with the bounded nature of light social interaction, thereby promoting it. Thus, the study proposes Hypothesis 3 (H3): Social distance mediates between social exclusion and light social interaction, whereby exclusion promotes such interaction by increasing perceived social distance.

Furthermore, algorithmic perception and social distance may mediate in a sequential and progressive manner. Social exclusion reduces algorithmic perception, lowering individuals' guard against algorithm-shaped, utilitarian frameworks. This erodes expectations and confidence for deep connections, widening social distance and making light social interaction a natural outlet. Thus, this study proposes the core Hypothesis 4 (H4): algorithmic perception and social distance form a chain mediation between social exclusion and light social interaction, whereby exclusion reduces perception and then increases distance, ultimately promoting such interaction.

2. Method

2.1. Participants

A sample of undergraduates was recruited from multiple universities in Zhejiang Province. Data were collected via an online survey. Of the 421 returned questionnaires, 370 were valid after excluding cases with missing data on key variables (effective response rate = 87.89%). The final sample comprised 193 males and 177 females, aged 17-24 years (M = 20.56, SD = 1.42).

2.2. Instruments

2.2.1. Social exclusion questionnaire

Perceived social exclusion was measured using the Social Exclusion Questionnaire [3]. The 19-item scale comprises direct and indirect exclusion dimensions. Items are rated on a 5-point Likert scale from 1 (never) to 5 (always), with higher scores indicating stronger perceived exclusion. It demonstrated good internal consistency (Cronbach's α = 0.92).

2.2.2. Algorithmic perception scale

The Algorithmic Perception Scale, adapted from the Multidimensional Scale of Perceived Social Support (MSPSS), comprises 16 items across direct and indirect perception dimensions. Items are rated on a 5-point Likert scale from 1 (not at all obvious) to 5 (extremely obvious). Higher scores reflect greater awareness of, and thus lower susceptibility to, algorithmic manipulation. It demonstrated good internal consistency (Cronbach's α = 0.90).

2.2.3. Social distance scale

The Social Distance Scale was adapted from the Bogardus Scale for Generation Z college students. This 7-item scale is rated from 1 (very unwilling) to 5 (very willing). Higher scores indicate greater perceived social distance. It demonstrated good internal consistency (Cronbach's α = 0.89).

2.2.4. Light social interaction scale

The Light Social Interaction Scale was adapted from the Behavioral Identification Form and the Multidimensional Self-Disclosure Scale [4-5]. This 8-item scale measures online and offline interaction. Items are rated on a 5-point Likert scale from 1 (very infrequent) to 5 (very frequent). Higher scores indicate more frequent light social interaction. It demonstrated good internal consistency (Cronbach's α = 0.87).

2.3. Data analysis

Data were analyzed in SPSS 22.0 for common method bias, descriptive statistics, and correlations. Chain mediation was tested via the bias-corrected percentile bootstrap method in PROCESS 3.5.

3. Results

3.1. Descriptive statistics and correlational analysis

As shown in **Table 1**, social exclusion was significantly negatively correlated with algorithmic perception and significantly positively correlated with both social distance and light social interaction. Algorithmic perception was significantly negatively correlated with both social distance and light social interaction, whereas social distance was significantly positively correlated with light social interaction.

Table 1. Descriptive Statistics and Correlation Analysis of the Variables (n= 370)

	M	SD	1	2	3	4
1 Social Exclusion	40.63	13.25	1			
2 Algorithmic Perception	32.65	10.25	-0.35**	1		
3 Social Distance	17.75	3.75	0.23**	-0.15**	1	
4 Light Social Interaction	27.52	5.12	0.62**	-0.36**	0.29**	1

Note. **P < 0.01

3.2. Model testing

Model 6 of Hayes's PROCESS macro for SPSS was used to test the mediation of algorithmic perception and social distance between social exclusion and light social interaction, with all variables standardized. Regression results are presented in **Table 2**.

Table 2. Regression analysis of algorithmic perception and social distance between social exclusion and light social interaction (n = 370)

Predictor	Model 1 (Algorithmic Perception)		Model 2 (Social Distance)		Model 3 (Light Social Interaction)	
	β	t	β	t	β	t
Social Exclusion	-0.182	-3.450***	0.522	11.437***	0.165	4.287**
Algorithmic Perception			-0.102	-3.457**	-0.092	-1.922*
Social Distance					0.235	3.164***
R	0.235		0.467		0.423	
R2	0.055		0.218		0.179	

Note. *P < 0.05, **P < 0.01, ***P < 0.001

Chain mediation was tested using the bias-corrected percentile bootstrap method with repeated sampling. As **Table 3** shows, the 95% confidence intervals for all paths excluded zero, indicating significant specific and chain mediation effects for algorithmic perception and social distance.

Table 3. Mediating effects of algorithmic perception and social distance

Path	Effect	Boot SE	BootLLCI	BootULCI	Proportion Mediated
Social Exclusion → Algorithmic Perception → Light Social Interaction	0.097	0.053	0.062	0.123	0.6357
Social Exclusion → Social Distance → Light Social Interaction	0.045	0.008	0.003	0.036	0.2364
Social Exclusion → Algorithmic Perception → Social Distance → Light Social Interaction	0.012	0.013	0.017	0.025	0.0625

4. Discussion

This study tested a chain mediation model examining how social exclusion influences light social interaction among college students. Results showed that social exclusion directly predicted this interaction and exerted indirect effects through three pathways: by reducing algorithmic perception, by increasing social distance, and through their chain mediation. All hypotheses were supported.

Support for Hypothesis 1 indicates that social exclusion directly drives light social interaction. This finding situates the behavior within a stress-coping framework, where excluded students adopt low-risk, controllable interaction to avoid harm and meet belonging needs. This adaptive shift serves as psychological defense, balancing emotional costs and social rewards. Thus, the prevalence of light social interaction may signal not merely preference, but widespread underlying social anxiety.

Hypotheses 2 and 3 confirmed the mediating mechanisms of algorithmic perception and social distance respectively. First, social exclusion reduces algorithmic perception, impairing cognitive vigilance and fostering uncritical adoption of standardized, algorithm-recommended and shallow social templates. Second, it increases social distance. This reflects an enduring cognitive change, where "distance-keeping" is internalized as a stable schema that aligns with the bounded nature of light social interaction.

Finally, Hypothesis 4 confirms a chain mediation effect, revealing a pathway where social exclusion reduces algorithmic perception and increases social distance, ultimately influencing light social interaction. Specifically, social exclusion first lowers vigilance to algorithms, fostering acceptance of their recommended patterns. These algorithm-shaped experiences then widen social distance, thereby consolidating engagement in light social interaction. This illustrates the cyclical interplay among social psychology, algorithms, and individual behavior in the digital age.

In summary, this study clarifies how social exclusion influences college students' light social interaction, confirming the independent and chain-mediating roles of algorithmic perception and social distance. The findings offer an integrated theoretical lens for understanding shifting youth social patterns in the digital era and carry practical implications. Fostering healthy interaction requires systemic intervention: enhancing digital literacy to cultivate critical autonomy from algorithmic logic individually, and building inclusive, supportive real-world communities to mitigate the source of social exclusion environmentally.

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