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Investigating the Interplay between Social Exclusion and Meaning in Life: The Catalytic Influence of Psychological Flexibility and Basic Psychological Needs

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Abstract

Background

Researchers found that social exclusion would influence meaning in life negatively, but the mediated mechanism and moderated boundary were not wholly concerned. Thus, this study examined the mediated effect of basic psychological needs between social exclusion and meaning in life; the moderating of psychological flexibility was also investigated.

Methods

Through a quantitative research design with a three-wave time lag, a sample of 1021 college students from China were investigated with questionnaires on social exclusion, meaning in life, basic psychological needs, and psychological flexibility.

Results

Social exclusion was negatively related to meaning in life, with basic psychological needs mediating (indirect effect = − 0.19, $p < 0.01$). Psychological flexibility significantly moderates the relationship between social exclusion and basic psychological needs (interaction effect = 0.14, $p < 0.01$). However, psychological flexibility moderates the mediating effect of basic psychological needs.

Conclusion

First, this study indicated that social exclusion might negatively affect college students' purpose in life. Thus, more resources and opportunities are required to fulfill students' various needs and assist them in obtaining interpersonal support. Second, educators should prioritize training to enhance the mental health of college students with low psychological flexibility and implement effective psychological adjusting measures and interventions. This result was intended to help college students accept the current situation, switch to a positive way of thinking, and enhance their meaning in life.

Introduction

When people feel that all possible scientific questions have been answered, the problem of life remains completely unsolved. The search for meaning in life is an everlasting topic that necessitates exploration throughout one's lifetime. The meaning of life provides the direction and goal of human life, the standard of behavior evaluation, the sense of control over life events and self-worth [1]. However, contemporary college students in China are facing increasing competitive pressure. Confronted with such pressure, some students have ceased their endeavors and become disoriented. This transition from the psychological extremity of competitiveness to the opposite extreme of opting out in favor of deliberate

non-participation reflects a prevailing deficiency in contemplation on the philosophical dilemma of the meaning of life among today's youth. In recent years, the lack of meaning in life has left Chinese college students suffering from “hollow heart disease”, resulting in academic burnout, waste of time, interpersonal hurt, self-harm, and even suicide [2]. With the increasing concern of positive psychology, the sense of meaning in life, as an essential factor in protecting individual mental health, has attracted significant academic attention. The meaning in life is closely related to mental health, and the loss of it is an essential reason for psychological maladjustment.

Life means embracing a strong sense of purpose, pursuing worthwhile personal goals, or having a transparent value system to guide one’s actions [3]. Generally, individuals with a stronger sense of meaning in life indicate a higher level of physical and mental health [4], while loss of meaning in life has negative effects on individuals, leading to self-harm, suicide, anti-social conduct, etc. [5]. As an essential stress-coping resource, meaning in life can effectively safeguard individuals and alleviate their depression and despair [6]. Strengthening the meaning in life is the primary issue in the development of teenagers, and having meaning in life is the fundamental resource for their growth [7]. Although previous studies have discussed the effect of meaning in life, they rarely delve into their antecedents. Hence, it has become a prevalent issue to investigate these factors further, reveal the underlying mechanism, and develop approaches to enhance the meaning of life for college students.

Social Exclusion and Meaning in Life

Existential psychology posits that people seek “meaning” in interpersonal interactions [8] and strive to establish meaningful social connections throughout their lives. As a major factor, solid social support provides a fertile ground for the growth of meaning in life. King proposed three fundamental ways to build meaning in life: belonging (relationships), action (engaging in meaningful activities), and knowing oneself and the world [9]. Belonging is a social support system that facilitates the creation of meaning in life. However, as the opposite of social support, social exclusion refers to the phenomenon that individuals are rejected by others and forbidden from participating in group activities, harming and hindering their demands for belonging and affiliation [10]. Researchers have pointed out that individuals who suffer from social exclusion lack social connections, which may enhance the possibility of deviant behavior [11]. Williams’ temporal need-threat model provides a theoretical basis for comprehending the individuals’ responses to social exclusion [12]. The model suggests that individuals who suffer from social exclusion have a diminished sense of control, self-esteem, belonging, and meaning, making them more susceptible to engaging in deviant behavior. Long-term social exclusion has been proven to deplete coping resources and impair the capacity to manage social interactions to obtain a sense of belonging, which in turn leads to intense feelings of depression, helplessness, and meaninglessness [13].

With the rapid development of high technology, college students are confronted with a critical period of physical and mental susceptibility. They experience pressure from various sources, including education, peer relationships, and future development [14]. Compared with children and adults, adolescents are more sensitive to external neglect and exclusion, which makes them vulnerable to social exclusion.

Meanwhile, social exclusion is a significant influencing factor on mental health. Prior studies have indicated that even accidental social exclusion can trigger negative emotions such as anger, sadness, anxiety, and depression [11]. In addition, social exclusion can also damage physical health by increasing serum cortisol concentrations [15]. Research has also revealed that ostracized persons adopt withdrawal behaviors accompanied by feelings of alienation, depression, helplessness, and meaninglessness to avoid suffering [13]. Baumeister's model of meaning in life [16] suggests that social exclusion reduces the meaning in life. Thus, we propose the following hypothesis.

Hypothesis 1

Social exclusion is negatively related to meaning in life.

The Mediating Role of Basic Psychological Needs

The concept of basic psychological needs, proposed by Deci and Ryan, suggests three basic psychological needs of human beings: competence, autonomy, and related needs [17]. Basic psychological needs are the necessities of an individual's everyday life. When the external environment meets the individual's basic psychological needs, they develop a more positive and healthy orientation and perfect themselves in meaningful ways. If individual's basic psychological needs are not satisfied, their development will be hindered. One of the most fundamental human needs is the desire to be acknowledged and accepted by others or social groups and to establish relatively positive, stable, and lasting relationships with others. Researchers have found that peer interactions matter in satisfying basic psychological needs. When college students experience exclusion from their peers, it leads to negative interpersonal experiences, hindering the fulfillment of their basic psychological needs [18], and impeding their need for belonging [19]. Research shows that interpersonal relationships are an essential environmental variable affecting life's sense of meaning. Social exclusion may hinder the individual's belonging needs, leading to the loss of meaning in life.

The basic psychological needs theory also states that individuals develop more positively and healthily when their external environment fulfills their basic psychological needs. Otherwise, their development will be hindered. The process of self-improvement and integration is creating the meaning of life [20, 21]. When the social environment fulfills basic psychological needs, satisfied individuals tend to feel meaningful and seek more life experiences that contribute to a high meaning level [22]. Conversely, individuals with low levels of satisfaction exhibit depression, apathy, and even suicidal intentions and behaviors [23].

Based on these findings, the study hypothesizes that basic psychological needs, as a major internal drive, may mediate social exclusion affecting the meaning of life. When college students are socially excluded, their basic psychological needs cannot be satisfied, reducing their meaning in life. Therefore, the following hypothesis is proposed.

Hypothesis 2

Basic psychological needs mediate the relationship between social exclusion and meaning in life.

The Moderating Role of Psychological Flexibility

Psychological flexibility is a set of thinking and behavioral skills supporting holistic well-being, resilience, and effectiveness [24]. Individuals with high psychological flexibility can accept and pay attention to their life experiences and feelings in the present moment, observe their self-experiences from a third-party perspective, and respond positively to adverse emotional events. However, individuals with low psychological flexibility will think rigidly, are more susceptible to negative emotions and thoughts, and may have difficulties in recovering from setbacks. As an influential situational factor for risk modification [25, 26], psychological flexibility can help individuals bounce back from adversity [27]. Research has demonstrated that psychological flexibility may be a primary influencing factor in psychological problems or mental disorders [28]. As the core concept of acceptance and commitment therapy, psychological flexibility enables individuals to adapt to various situations, alter their thought patterns, and develop appropriate coping strategies [29]. Social exclusion is also a situational risk factor. Particularly, when encountering social exclusion, college students with higher psychological flexibility are better equipped to cope with stress and buffer the negative effects of unfulfilled basic psychological needs, owing to their stronger psychological resilience. In contrast, those with low psychological flexibility may have difficulty freeing themselves from adversity due to their rigid mindset after being caught in negative emotions and perceptions. Accordingly, the following hypotheses are proposed.

Hypothesis 3

Psychological flexibility moderates the relationship between social exclusion and basic psychological needs. The higher the psychological flexibility of an individual, the weaker the negative relationship between them, and vice versa.

Integrating hypothesis 2 with hypothesis 3 can be further explained as a moderated mediation effect. The indirect impact of social exclusion on the meaning of life via basic psychological needs will be contingent upon one’s level of psychological flexibility. Specifically, the stronger the effect of social exclusion on basic psychological needs is when employees have higher psychological flexibility, which leads to a higher likelihood of engaging in the meaning of life. Thus, we posit that the indirect effect of social exclusion on the meaning of life via basic psychological needs will be more substantial when psychological flexibility is higher (vs. lower). In summary, the moderated mediation hypothesis is proposed.

Hypothesis 4

Psychological flexibility moderates the role of basic psychological needs in the relationship between social exclusion and meaning in life. The higher the psychological flexibility college students have, the weaker the mediating role of basic psychological need satisfaction will be, and vice versa.

The overall theoretical framework of the study is presented in Fig. 1.

METHOD

Sample and procedure

The study employed a cluster sampling method with online questionnaires to investigate the relationship between social exclusion, psychological flexibility, basic psychological needs, and meaning in life. Participants were recruited through public courses at two universities in Zhejiang province, China. Completing the surveys was voluntary to assure anonymity. After checking that participants understood the instructions, they completed the survey independently.

Due to common method bias that might exaggerate the correlation between variables and lower the precision of results, we gathered data in three phases. For the first time, participants were asked to complete the questionnaires on social exclusion, psychological flexibility, and demographics. We gathered a sample of 1253 individuals. One week later, the same procedures were followed to distribute questionnaires for the second time, in which respondents were required to rate their degree of basic psychological needs. At this stage, 1,134 valid questionnaires were gathered. Approximately one week later, for the third time, respondents were asked to complete a measure of meaning in life. After eliminating invalid data and matching the three data waves, we eventually maintained 1021 respondents in the sample. Overall, 81.5% of requested data were returned.

Among the valid questionnaires, 430 males (42.1%) and 591 females (57.9%) participated, with 327 freshmen (32.0%), 342 sophomores (33.5%), 190 juniors (18.6%), and 162 seniors (15.9%).

Variables measurement

Social exclusion

The study utilized the Chinese version of the Ostracism Experience Scale for Adolescent Scale (OES-A) to assess the extent of social exclusion experienced by students. The OES-A was originally developed by Gilman [30] and subsequently revised by Zhang et al. [31]. The scale contained 11 items, measuring two dimensions of neglection and rejection. Respondents rated their agreement level on a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). A sample item is “In general, others treat me as if I am invisible.” (Cronbach’s $\alpha = .92$).

Basic psychological needs

The Basic Psychological Needs Scales (BPNS) for students were used to examine the basic psychological needs in the study. The BPNS was initially complied with by Gagne [32] and later revised by Liu et al. [33]. The scale comprised 21 items that were divided into three dimensions: autonomy

needs, relationship needs, and competence needs, with 7, 6, and 8 items, respectively. Respondents indicated their level of agreement on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Sample items included, “I feel I can decide how to live my life” (Cronbach’s $\alpha = .89$).

Meaning in life

The study adopted the Meaning in Life Questionnaire (MLQ) by Steger et al. [34] to assess the perception of meaning in life and the drive to pursue meaning in life among participants. The questionnaire comprised two subscales, namely, the presence of meaning and the pursuit of meaning, each consisting of 5 items. Examples included “I understand my life’s meaning” and “I am looking for something that makes my life feel meaningful”. Participants were required to rate their level of agreement on a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree), with higher scores indicating a greater sense of meaning in life (Cronbach’s $\alpha = .86$).

Psychological flexibility

The present study evaluated psychological flexibility using the Acceptance and Action Questionnaire-2nd Edition (AAQ-II), which was originally developed by Bond et al. [35] and adapted by Cao et al. [36] with comprehensive reliability assessment in China. The scale comprised 7 items, with a five-point response format ranging from 1 (strongly disagree) to 5 (strongly agree). Reverse scoring was applied to higher scores, indicating greater psychological flexibility. A sample item from the AAQ-II is “It seems like most people are handling their lives better than I am” (Cronbach’s $\alpha = .90$).

Control variables

In the current study, we controlled demographic factors, including gender and grade. Gender was dichotomized as 1 for male and 2 for female, while grade level was classified into four categories: 1 for freshman, 2 for sophomore, 3 for junior, and 4 for senior.

Analytic strategy

Our research employed SPSS 24.0 and Amos 26.0 for data analysis and implemented Bootstrapping through the PROCESS V3.3 macro program of SPSS. Initially, a confirmatory factor analysis was performed to evaluate the validity and determine the Cronbach’s α to assess internal consistency. Secondly, descriptive statistics and Pearson correlations were computed to examine the relationships among the research variables. Thirdly, model 4 in the SPSS PROCESS macro was used to evaluate the mediating effect of basic psychological needs. In contrast, Model 7 was employed to investigate the moderating effect of psychological flexibility on the indirect relationship between social exclusion and meaning in life. Furthermore, demographic characteristics were controlled while assessing the mediating and moderating effects. Bootstrap confidence intervals (CIs) evaluated the significance of the effects of Model 4 and Model 7 based on 5,000 random samples. An effect was deemed significant if the CIs did not include 0.

RESULTS

Confirmatory Factor Analysis

Using the Harman one-factor test, we first examined the common method bias [37]. The results showed that the mutation rate explained by the first factor was 25.32%. This value was less than the critical value of 40%, suggesting that this study did not deviate significantly from the common method.

Further, we compared the baseline four-factor model with the three-factor, two-factor, and one-factor models. The results are shown in Table 1. The comparison was based on the changes in chi-square (i.e., χ^2), comparative fit index (CFI), incremental fit index (IFI), and root mean square error of approximation. The comparison revealed that the four-factor model (with χ^2/df = 2.82, IFI = .90, CFI = .90, and RMSEA = .04) fit the data better than other alternative models [38, 39], supporting the discriminatory validity of the constructs. This indicated the capacity of the respondents involved in the investigation to distinguish between the focal constructs.

Table 1
Results of confirmatory factor analysis

Measurement Models	χ^2	*df*	χ^2/df	RMSEA	IFI	CFI
Model 1: One-factor (combined all items into one factor)	10162.31	1080	9.41	.09	.53	.53
Model 2: Two-factor (combined SE and BPN into one factor, and combined ML and PF into one factor)	8263.60	1079	7.66	.08	.63	.63
Model 3: Three-factor (combined SE and BPN into one factor)	5466.17	1077	5.08	.06	.77	.77
Model 4: Four-factor	3027.70	1074	2.82	.04	.90	.90

Social exclusion = SE, Basic psychological needs = BPN, Meaning in life = ML, Psychological flexibility = PF.

Descriptive Statistics and Correlation Analysis

Table 2 displays the variables' means, standard deviations, Cronbach's α, and correlation coefficient. Social exclusion was significantly negatively associated with basic psychological needs (r = − .49, p < 0.01) and with meaning in life (r = − .35, p < 0.01). In contrast, basic psychological needs were positively correlated with meaning in life (r = .32, p < 0.01). Hence, these findings tentatively validated the forthcoming regression analysis.

Table 2
Descriptive statistics of and correlations among study variables

Variable	*M*	*SD*	1	2	3	4	5	6
1 Gender	1.58	.49						
2 Grade	2.18	1.05	.03					
3 Social exclusion	2.64	.60	.06	− .04	(.90)			
4 Basic psychological needs	3.33	.44	− .04	.04	− .49**	(.89)		
5 Psychological flexibility	3.30	.73	− .04	.02	− .43**	.43**	(.90)	
6 Meaning in life	3.52	.50	.01	.01	− .35**	.32**	.23**	(.86)
Note: *$p < 0.05$; **$p < 0.01$.								

Hypotheses Testing

To assess the mediating effect of basic psychological needs on the relationship between social exclusion and meaning in life, we applied model 4 from Hayes' SPSS Macro PROCESS [40]. Results showed that social exclusion negatively predicted meaning in life ($\beta = -.35$, SE = .03, $p < 0.01$). Hypothesis 1 was supported. The bootstrapping test indicated that CI did not include 0 ($\beta = .19$, SE = .03, $p < 0.01$), suggesting that basic psychological needs partially mediated the relationship between social exclusion and meaning in life. Furthermore, the direct predictive effect (-.25) accounted for 71.43% of the total effect, while the mediated predictive effect (-.10) accounted for 28.57% of the total effect, which confirmed Hypothesis 2.

In the second phase, we tested the moderated mediation model with Model 7 of the PROCESS. As presented in Table 3, the interaction between social exclusion and psychological flexibility significantly predicted basic psychological needs (Social exclusion × Psychological flexibility: $\beta = .14$, SE = .02, $p < 0.01$) after psychological flexibility was entered into the model. This finding indicates that psychological flexibility moderates the relationship between social exclusion and basic psychological needs. To further examine the moderation pattern of psychological flexibility, we obtained Fig. 2 based on the simple slope test suggested by Aiken and West [41]. The figure displayed the interaction effect at different levels of psychological flexibility (i.e., + 1 SD or -1 SD). Figure 2 indicated this moderating effect: social exclusion was more negatively associated with basic psychological needs when psychological flexibility was low rather than high. Consequently, hypothesis 3 was validated.

Table 3
Moderated mediation effect analysis

	M1(criterion: basic psychological needs)				M2 (criterion: meaning in life)			
	β	SE	*p*	95% CI	*β*	SE	*p*	95% CI
Control Variables								
Gender	− .01	.05	.92	[-.11, .10]	.07	.06	.22	[-.04, .19]
Grade	.02	.02	.46	[-.03, .07]	− .01	.03	.85	[-.06, .05]
Independent variable								
Social exclusion	− .36**	.03	.00	[-.41, − .30]	− .25**	.03	.00	[-.32, − .19]
Mediator								
Basic psychological needs					.19**	.03	.00	[.13, .26]
Moderator								
Psychological flexibility	.29**	.03	.00	[.23, .35]				
Interaction term								
Social exclusion× Psychological flexibility	.14**	.02	.00	[.09, .19]				
R^2	.32				.15			
F	96.67**				45.09**			

Note: *$p < 0.05$; **$p < 0.01$.

Further, Edwards and Lambert's conditional indirect effects were used to test hypothesis 4 [42]. The conditional indirect effect of social exclusion through basic psychological needs on the meaning in life at different levels of psychological flexibility was assessed by bootstrapping the bias-corrected CIs. As shown in Table 4, the indirect effect of social exclusion on meaning in life via basic psychological needs was stronger and more significant at low levels of psychological flexibility (effect size=-.10, 95% bias-corrected CI from − .15 to − .05) but weaker at high levels of psychological flexibility (effect size = − .04, 95% bias-corrected CI from − .08 to − .02). Hence, hypothesis 4 was confirmed.

Table 4
Conditional indirect effects across levels of psychological flexibility

Level	Effect size	Boot SE	LL 95% CI	UL 95% CI
M-SD	− .10	.03	− .15	− .05
M	− .07	.02	− .11	− .03
M + SD	− .04	.02	− .08	− .02

Discussion

Results Analysis

Based on basic psychological needs theory, the study explores the impact of social exclusion on college students' meaning in life through the mediation of basic psychological needs. First, the study reveals that social exclusion can significantly and negatively affect college students' meaning in life. Social exclusion is common for adolescents who are in a critical period of physical and mental susceptibility. It can lead to the depletion of coping resources, causing anxiety, social alienation, and a lack of meaning in life, which will reduce or even extinguish one's courage to face one's life. Furthermore, social exclusion deprives individuals of valuable resources that enable them to connect with society [43], ultimately threatening their perceptions of the meaning of life [44, 45]. This result is consistent with previous research, which showed that social exclusion leads to intense feelings of depression, helplessness, and worthlessness [13].

Second, the study results suggest that basic psychological needs partially mediate the relationship between social exclusion and meaning in life. As a negative interpersonal experience, social exclusion challenges individuals' basic psychological needs[18], decreasing meaning in life. This finding aligns with prior research that peer interactions influence their basic psychological needs. Meanwhile, Zhang et al. suggested that basic psychological needs were the fundamental motivation for creating a sense of meaning in life[46]. When individuals' basic psychological needs were fulfilled, they would gain a positive meaning in life. Otherwise, those who lack fulfillment would deny and doubt themselves and develop a negative feeling of meaninglessness and emptiness. This is consistent with the findings of this study.

The findings indicate that psychological flexibility moderates the relationship between social exclusion and basic psychological needs. By examining the moderated mediated model, the study further demonstrates that psychological flexibility negatively moderates the mediation of basic psychological needs between social exclusion and meaning in life. Individuals with high levels of psychological flexibility possess more effective coping strategies. They are more likely to recover from pressured situations of social exclusion [47], moderating basic psychological needs and eventually maintaining and enhancing their sense of value and meaning in their lives.

Theoretical Implications

First, existing research has primarily concentrated on the consequences of social exclusion on negative feelings and undesirable behaviors. Conversely, investigating the impact of positive psychological resources and behaviors on individuals is scarce. This study expands the scope of research on social exclusion. Meanwhile, the study supports the temporal need-threat model, which posits that socially ostracized individuals experience a relative lack of social connections and a diminished sense of purpose [13].

Second, although there is numerous research on the meaning of life, influencing factors of the meaning in life have received limited attention. Based on the theory of basic psychological needs, this study reveals the mechanism of social exclusion in forming meaning in life. It verifies the core role of basic psychological needs in this process. The study underscores the importance of belonging to relationships as a social support system to help individuals generate meaning in life. Without belonging, individuals may lose meaning in life[17], which is consistent with King's three basic methods of establishing meaning in life [9]. As such, the research provides a new perspective for studying the elements influencing meaning in life.

Third, this paper introduces psychological flexibility into the study to investigate the causality of meaning in life, which enhances prior research and constructs a theoretical framework for meaning in life. The study confirms that psychological flexibility is regarded as an influential, effective situational variable for risk modification [25, 26] since it enables individuals to bounce back from adversity [27]. Clarifying boundary conditions of social exclusion affecting meaning in life effectively enhances the research of meaning in life.

Practical Implications

First, the present study provides insights into the negative impact of social exclusion on college students' meaning in life. The greater social exclusion college students suffer, the more likely they lose their belief and sense of value in life. Therefore, educators should create an inclusive and harmonious environment, pay more attention to excluded students, and actively seek help when suffering social exclusion. Educators are also advised to offer timely psychological guidance, constructive mental instruction, and preventive intervention for college students who suffer from social exclusion to reduce the case of college students who lack meaning in life.

Second, this study reveals that basic psychological needs are essential in this process, highlighting educators' need to change traditional educational perceptions. Educators must broaden their focus beyond students' academic performance, recognize the multifaceted nature of students' needs, and provide ample resources and opportunities to cater to them. Teachers should collaborate to offer the necessary interpersonal support to ensure that students' basic psychological needs are met, resulting in higher levels of meaning in their lives.

Finally, this study also shows individual differences in the mechanism of social exclusion. Individuals with low psychological flexibility are inclined to respond to the adverse consequences of social exclusion

with rigid interpretations, thus reinforcing the negative outcomes associated with unfulfilled basic psychological needs. In contrast, those with high psychological flexibility can dismount their defenses against the present circumstances to sense and experience the moment, effectively cushioning the negative outcome of unfulfilled basic psychological needs. College students suggested avoiding ruminating on negative outcomes resulting from social exclusion. Instead, they are supposed to embrace the present status and convert to a constructive mindset to sustain and enhance the meaning of their lives. Thus, educators should conduct targeted training to improve the mental ability of college students with low psychological flexibility and implement essential psychological adjusting measures and effective interventions to improve their psychological flexibility.

Limitations and Future Research

Firstly, this is a cross-sectional study with limited causal relationships between variables. A longitudinal study could be used to discuss further the issues raised in this study and reveal other possible causal relationships. Second, due to constraints of time, workforce, and resources, the scope of this study was limited. To enhance the external validity of the findings, future research can seek to expand the sample's source and scope. This could include investigating the phenomenon in different cultural contexts or with larger and more diverse samples. Third, this study found that basic psychological needs partially mediate the relationship between social exclusion and meaning in life, suggesting that other mediating variables may exist. Thus, the variables that can be exploited in future studies include social anxiety, etc.

Declarations

Ethics approval and consent to participate

Informed consent to participate was obtained from all of the participants in the study. Furthermore, the study was developed in accordance with the Declaration of Helsinki and was approved by the institutional review board of the School of Marxism, Communication University of Zhejiang.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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Author Contribution

Q. L.: Writing - original draft, Methodology, Formal analysis, Conceptualization, Validation, Supervision.Z. Z.: Writing - review & editing.

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Availability of data and material

Data will be available on request.

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Figures

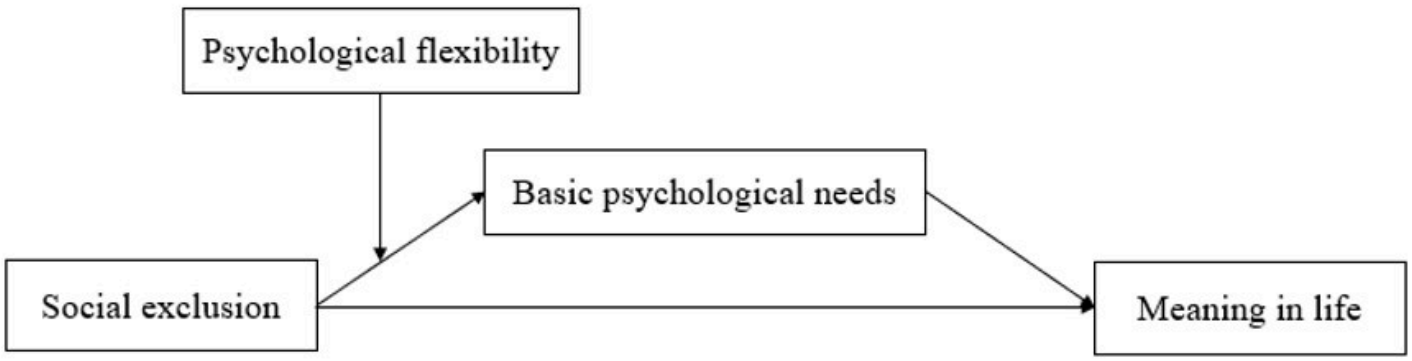

Figure 1

Conceptual model

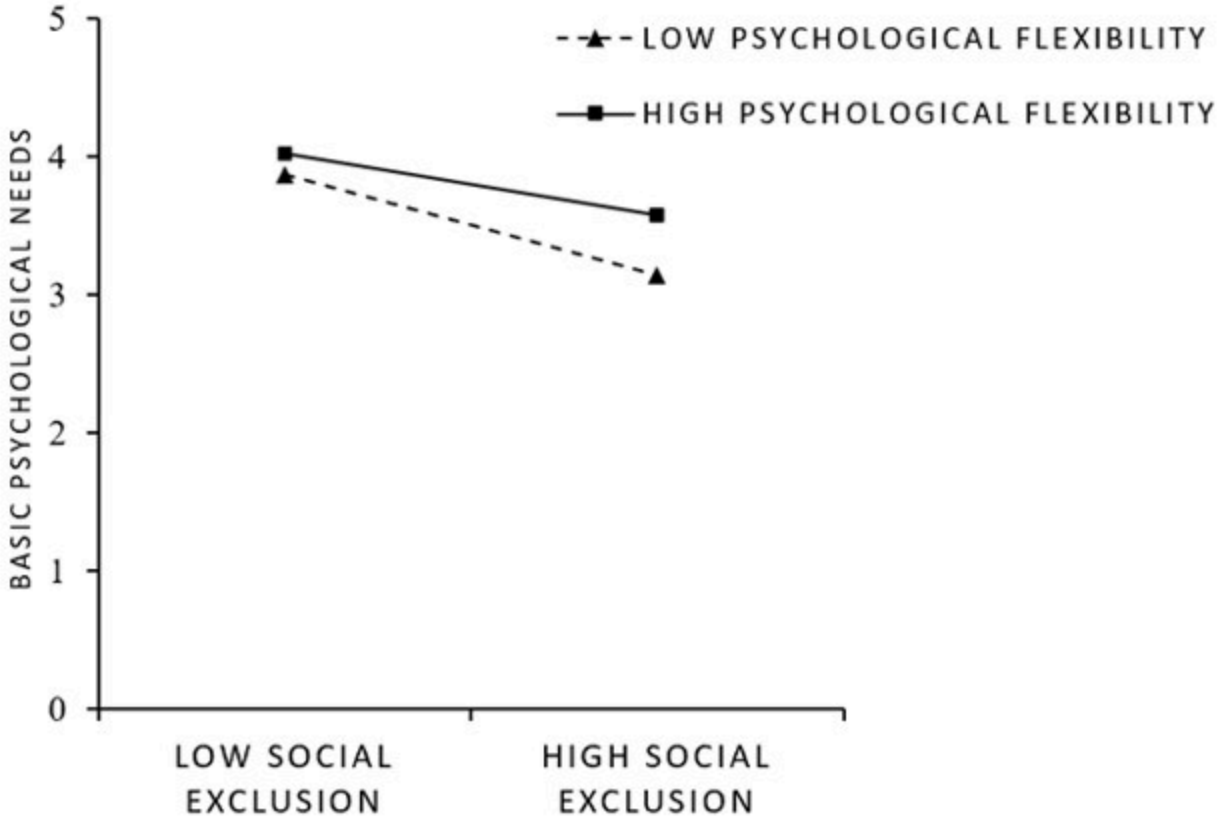

Figure 2

Interaction of social exclusion and psychological flexibility predicting basic psychological needs