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Disability stereotypes and willingness for intergroup contact among undergraduate students without disabilities: A moderated mediation model grounded in Integrated Threat Theory

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Keywords: disability stereotypes, willingness for intergroup contact, intergroup anxiety, empathy, Integrated Threat Theory

Posted Date: November 6th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-9757678/v1

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Additional Declarations: No competing interests reported.

Abstract

Background

Although disability stereotypes constitute a key cognitive barrier hindering the social inclusion of people with disabilities, the psychological mechanisms through which they suppress intergroup engagement remain insufficiently understood. This study is grounded in Integrated Threat Theory (ITT) and expands the said theory's scope to the disability-related intergroup context, while also examining the impact of stereotypes on interaction willingness and uncovering the complex interplay of mediating and moderating factors.

Methods

A total of 1,661 undergraduate students without disabilities completed the Disability Stereotype Questionnaire, Intergroup Anxiety Scale (IAS), Interpersonal Reactivity Index (IRI-C), and Social Distance Scale (SDS).

Results

The study indicated that disability stereotypes significantly negatively predicted willingness for intergroup contact. Intergroup anxiety partially mediates this association. Moreover, empathy significantly moderated the second stage of the mediation process, attenuating the negative effect of intergroup anxiety by 64.4% at high levels of empathy. Frequent intergroup contact also buffered this inhibitory effect.

Conclusions

These findings substantially broaden the explanatory scope of ITT and have vital implications for fostering inclusion in higher education settings.

1 Introduction

People with disabilities remain among the most systemically marginalized and socially excluded groups globally. A key barrier to their equitable social inclusion is the lack of positive intergroup contact with peers without disabilities (Dole et al., 2025; Gréaux et al., 2023; World Health Organization [WHO], 2022). Positive intergroup interaction—conceptualized as a dynamic process of building and sustaining cross-group relationships—is widely recognized as a foundational pathway to reducing intergroup segregation and fostering long-term intergroup harmony (Allport, 1954; Gréaux et al., 2023; Pettigrew & Tropp, 2006). Specifically, this process corrects biased cognitive representations by reducing endorsed prejudices; alleviates affective barriers to establishing equal and trusting cross-group relationships; and expands social participation opportunities, thereby advancing the social inclusion of people with disabilities (Branco et al., 2025; Dole et al., 2025; Keith et al., 2015; Magsamen-Conrad et al., 2017). These benefits underscore the importance of identifying the factors that shape the willingness of people without disabilities to engage in intergroup contact, which is the central focus of the present study.

Despite growing global institutional and policy efforts to promote meaningful contact between people with and without disabilities, the willingness for such interactions remains consistently low throughout the lifespan (Branco et al., 2025; Dole et al., 2025; Ji et al., 2025; WHO, 2022; Zhu et al., 2025). Public attitudes towards inclusive education also remain relatively negative (Li & Luo, 2024). During childhood and adolescence, students with disabilities often face social exclusion in school settings, including isolated mealtime, high levels of solitude (37%), and exposure to verbal violence (42%). Moreover, 71% of typically developing children report actively avoiding interaction with peers with disabilities, limiting social opportunities and undermining motivation for proactive social engagement. In adulthood, only 27% of individuals with disabilities engage in social activities at least once a month. Additionally, the general public often shows automatic behavioral tendencies of physical aversion and avoidance of people with disabilities (Zhou, 2018). Only 45% of respondents perceive disability diversity as a social asset (Robert Bosch Foundation, 2025).

Consequently, exploring the determinants and underlying mechanisms of the public's willingness to partake in intergroup contact is critical for realizing high-quality social inclusion for individuals with disabilities. However, much of the current literature lacks a unified

theoretical lens through which to synthesize the complex cognitive and affective precursors of such intentions. Grounded in **Integrated Threat Theory (ITT)**, which posits that intergroup prejudice and exclusionary behaviors arise from the interplay of multiple perceived threats rather than a single factor (Stephan, 2014; Stephan & Stephan, 2013), the present study extends this framework to the disability-related intergroup context. By utilizing ITT to elucidate how multifaceted threats shape interaction intent, this study offers a more comprehensive understanding of the psychological pathways toward inclusion. These threats can be classified into four categories: realistic threats, symbolic threats, negative stereotypes, and intergroup anxiety. The former two represent macro-level factors—realistic threats involve conflicts over material interests (e.g., resources and opportunities), while symbolic threats involve conflicts regarding values and lifestyles. The latter two constitute micro-level factors—negative stereotypes strengthen threat perceptions by consolidating negative expectations about the target group's characteristics, while intergroup anxiety reflects anticipated negative experiences during intergroup interactions. Accordingly, the present study focuses on the two micro-level factors most proximal to intergroup outcomes: disability stereotypes and intergroup anxiety. Moreover, empathy—a fundamental variable influencing interpersonal interaction (Cuff et al., 2016; Davis, 1996)—is incorporated to investigate its moderating role in interactions between undergraduate students without disabilities and individuals with disabilities.

1.1 Disability Stereotypes

Stereotypes are defined as relatively stable clusters of beliefs regarding the characteristics of specific social groups. As cognitive schemas, they simplify social perception and facilitate rapid categorization of out-groups (Devine, 1989; Hamilton & Sherman, 2014). Extensive empirical research indicates that negative stereotypes toward marginalized populations (e.g., older adults, people experiencing economic disadvantage, and ethnic minorities) often emerge in contexts of limited intergroup contact (Gao, 2019; Kuhlmann et al., 2016; Kunstman et al., 2016; Zhang et al., 2021). Mediated by threat perception, such stereotypes can elicit intergroup prejudice, discrimination, and stigmatization, thereby constituting a significant barrier to intergroup interaction (Bao et al., 2023; Chen et al., 2025). In the context of disability, people with disabilities are routinely targets of negative stereotyping. Linguistically, the derogatory appropriation of terms like "blind," "deaf," "fool," and "madman" as insults not only constitutes verbal violence but also reduces individuals to their physiological or psychological impairments, framing these impairments as the defining feature of their identities. This process fosters a cognitive bias in which an individual's social roles are conflated with their perceived "disability-related deficits" (Guan et al., 2017). Moreover, entrenched stereotypes restrict perceptions of capabilities by attributing negative social metaphors—including eccentric, unsightly, incompetent, inauspicious, or dangerous—to individuals with disabilities (Wang et al., 2022).

Drawing on the Stereotype Content Model (SCM), Rohmer and Louvet (2012) identified that implicit stereotypes of individuals with disabilities are typically characterized by low warmth (e.g., friendliness) and competence (e.g., capability). This pattern is particularly pronounced in workplace contexts, where perceptions of low competence are strongly associated with employment discrimination (Rohmer & Louvet, 2018). Notably, implicit stereotypes regarding invisible disabilities (e.g., mental disorders, learning disabilities) tend to be more negative than those concerning visible disabilities (e.g., physical or sensory impairments) (Fan et al., 2025). Extending the SCM, Canton et al. (2023) introduced an additional "courage" dimension (e.g., bravery and determination), classifying four clusters of disability stereotypes: (1) low warmth, competence, and courage (e.g., schizophrenia and depression); (2) moderate warmth and courage but low competence (e.g., Alzheimer's disease [AD], Autism Spectrum Disorder [ASD], and Attention-Deficit/Hyperactivity Disorder [ADHD]); (3) high warmth and courage but low competence (e.g., Down syndrome and traumatic brain injury); and (4) high warmth, competence, and courage (e.g., physical and sensory impairments). Based on the theoretical framework and empirical evidence presented above, we propose Hypothesis 1: Disability stereotypes significantly negatively predict undergraduate students without disabilities' willingness to engage in intergroup contact with people with disabilities.

1.2 Intergroup Anxiety

Intergroup anxiety, defined as a prevalent negative emotional state experienced during intergroup contact, encompasses feelings of tension, awkwardness, distress, or hostility stemming from expectations of negative psychological or behavioral outcomes, and/or negative evaluations by in-group or out-group members (Stephan, 2014; Stephan & Stephan, 1985; Turner et al., 2008). The Consequences of Intergroup Anxiety and Causal Model (CIACM) elucidates the mechanistic pathway via an "antecedents-anxiety-consequences-feedback" loop (Guan, 2017; Stephan, 2014). Antecedents comprise four interacting categories: individual traits and identities (e.g., social dominance orientation), cognitions and attitudes (e.g., negative stereotypes), prior contact experiences, and situational constraints (e.g., power dynamics), which collectively precipitate anxiety. Subsequently, anxiety engenders consequences, including cognitive rigidity (reinforcing negative expectations), affective diffusion (generalizing fear to the in-group), and behavioral conflict (ranging from avoidance to hostility). Crucially, these consequences feed back into antecedents; for instance, behavioral

avoidance may elicit negative responses from the out-group, thereby validating initial anxious expectations of hostility. Ultimately, intergroup anxiety diminishes willingness to engage with out-groups, precipitates negative reactions, impedes effective communication, and fosters intergroup distrust.

This theoretical framework has been empirically validated across diverse contexts—including mental health, socioeconomic status, doctor-patient dynamics, ethnic relations, gender, and intergenerational relationships—supporting the mediating role of intergroup anxiety between threat perception and intergroup relations (Ai & Zhou, 2018; Gao, 2019; J. Guan et al., 2023). Regarding disability, LaBelle et al (2013) demonstrated that negative attitudes toward individuals with severe hearing impairments are significantly associated with elevated intergroup anxiety and social dominance orientation. More recently, Zhu et al (2025) observed that although a perceived inclusive workplace climate reduces social anxiety among employees with disabilities, this protective effect is attenuated by disability severity and mediated by disability acceptance. Specifically, greater disability severity correlates with lower public acceptance, thereby weakening the benefits of an inclusive environment. Based on this theoretical framework and empirical evidence, we propose Hypothesis 2: Intergroup anxiety partially mediates the relationship between disability stereotypes and undergraduate students without disabilities' willingness to engage in intergroup contact with people with disabilities.

1.3 Empathy

Empathy, a fundamental competency for effective social interaction, is defined as a dynamic psychological process involving the understanding and inference of others' emotions, cognitions, and behaviors (Cuff et al., 2016; Hall & Schwartz, 2019). According to the Dynamic Model of Empathy, this process begins with affective sharing, followed by self-other differentiation and cognitive evaluation based on personal values, and culminates in explicit or implicit behavioral responses directed toward others. Structurally, empathy is a multidimensional construct comprising four components: Perspective Taking (PT), Fantasy (FS), Empathic Concern (EC), and Personal Distress (PD). The former two constitute cognitive empathy, facilitating the understanding of others' mental states through perspective-shifting; the latter two constitute affective empathy, characterized by emotional responsiveness manifesting as either altruistic concern or personal anxiety.

The Empathy-Altruism Hypothesis posits that empathic concern (e.g., sympathy, compassion) for others elicits altruistic motivation, thereby fostering prosocial behavior (Batson, 1987). Empathy is pivotal across diverse social domains—including interpersonal interaction, moral judgment, and group cooperation—by enabling individuals to emotionally resonate with others and accurately appraise their emotional states (Elliott et al., 2011). Functioning as a pivotal moderator, heightened empathy enhances sensitivity to others' emotions and needs, thereby mitigating cognitive biases, buffering negative affect, and fostering positive behavioral outcomes (Canioz & Coskun, 2019; Fang et al., 2020; Islam et al., 2019; Kokkinos & Voulgaridou, 2019; Tan et al., 2025; Zhao et al., 2025). Based on this theoretical framework and empirical evidence, we propose Hypothesis 3: Empathy significantly moderates two pathways: (H3a) the direct relationship between disability stereotypes and undergraduate students without disabilities' willingness to engage in intergroup contact, and (H3b) the mediating role of intergroup anxiety in the relationship between disability stereotypes and willingness to engage in intergroup contact.

1.4 The Current Study

Building on ITT, the present study constructs a moderated mediation model (see Fig. 1) to examine the impact of disability stereotypes on undergraduate students without disabilities' willingness to engage in intergroup contact with individuals with disabilities. Specifically, the model investigates the mediating role of intergroup anxiety and the moderating role of empathy. To enhance the ecological validity of the model, the analysis controls for key demographic covariates (i.e., gender, geographic region of residence, and frequency of prior contact with people with disabilities) across all hypothesized pathways.

<Figure 1 about here>

2 Method

2.1 Participants

Participants were recruited via stratified sampling using an online survey platform (Wenjuanxing; https://www.wjx.cn) across multiple regions in China, including Shandong, Liaoning, Henan, Anhui, Xinjiang, Gansu, and Sichuan. A total of 1,800 undergraduate students without disabilities initially participated. Data quality was ensured by excluding invalid responses based on two criteria: failure to pass attention checks (e.g., "Please select 'very important'") and insufficient completion time (less than 2 minutes). Consequently, 1,661

valid questionnaires were retained for analysis, yielding an effective response rate of 92.28%. The study protocol was approved by the Institutional Review Board (IRB) of University X. All participants provided informed consent prior to participation.

<Table 1 about here>

Table 1
Demographic characteristics of the participants

Variable	Category	N	Percentage (%)
Gender	Male	323	19.4
	Female	1338	80.6
Grade	Freshman (Year 1)	462	27.8
	Sophomore (Year 2)	468	28.2
	Junior (Year 3)	435	26.2
	Senior (Year 4)	296	17.8
Residence	Rural	1082	65.1
	Urban	579	34.9
Contact Frequency	Never	166	10
	Rarely	1173	70.6
	Often	209	12.6
	Always	113	6.8
Contact Methoda	Media or Internet	921	55.4
	Encountered in daily life	1299	78.2
	Classmates with disabilities	195	11.7
	Friends or relatives with disabilities	382	23
Note. a = Participants could select multiple options for Contact Method.			

2.2 Measures

2.2.1 Disability Stereotypes

Disability stereotypes were assessed using the Disability Stereotype Questionnaire (Liu, 2014). The scale comprises 23 items using bipolar adjective pairs (e.g., brave vs. timid; capable vs. clumsy), rated on a 7-point semantic differential scale ranging from 1 (indicating the left adjective) to 7 (indicating the right adjective). Seven items featuring negative adjectives as the left anchor (Items 4, 6, 14, 15, 17, 18, and 21) were reverse-scored. Lower total scores indicate more positive stereotypes toward individuals with disabilities. In the current study, Cronbach's α for this scale was 0.88. Confirmatory factor analysis (*CFA*) indicated satisfactory model fit: = 3.16, *SRMR* = 0.06, *GFI* = 0.90, *CFI* = 0.89, *NFI* = 0.90, *TLI* = 0.92, *RMSEA* = 0.07. These indices met widely accepted standards, demonstrating robust construct validity.

2.2.2 Intergroup Anxiety

Intergroup anxiety was assessed using the Chinese revised version of the Intergroup Anxiety Scale (IAS). The scale consists of 10 items rated on a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree). A sample item includes "I feel awkward when interacting with individuals with disabilities at a close distance." Three items (Items 5, 6, and 7) were reverse-scored to ensure consistency. Higher aggregate scores signify higher intergroup anxiety. In this study, Cronbach's α for this scale was 0.80. CFA results indicated good model fit: = 3.87, *SRMR* = 0.02, *GFI* = 0.95, *CFI* = 0.93, *NFI* = 0.95, *TLI* = 0.94, *RMSEA* = 0.07.

2.2.3 Empathy

Empathy was assessed using the Chinese version of the Interpersonal Reactivity Index (IRI-C; Davis, 1980; Zhang et al., 2010). The scale includes 22 items rated on a 5-point Likert scale. It includes four subscales: Perspective Taking (PT) and Fantasy (FS), which constitute the cognitive empathy dimension; and Empathic Concern (EC) and Personal Distress (PD), which constitute the affective empathy dimension. Five items (Items 2, 5, 10, 11, and 14) were reverse-coded. Higher aggregate scores indicate greater empathy. In the current study, Cronbach's α was 0.75 for the total scale, with subscale coefficients ranging from 0.60 to 0.72. CFA results demonstrated an acceptable model fit: = 4.91, *SRMR* = 0.02, *GFI* = 0.91, *CFI* = 0.90, *NFI* = 0.91, *TLI* = 0.89, *RMSEA* = 0.08.

2.2.4 Willingness for Intergroup Contact

Willingness for intergroup contact was assessed using the Chinese version of the Social Distance Scale (SDS; Ai & Zhou, 2018; Bastian et al., 2012). The scale assesses behavioral intentions of individuals without disabilities to interact with people with disabilities across five social domains: friendship, employment, residential proximity, marriage, and hospitality. It consists of five items rated on a 5-point Likert scale (1 = strongly unwilling, 5 = strongly willing). A representative item is "Would you be willing to host a person with a disability in your home for the night?" Higher aggregate scores reflect lower social distance and greater willingness for intergroup contact. In the current study, Cronbach's α for this scale was 0.71. CFA results indicated an acceptable model fit: = 4.25, *SRMR* = 0.03, *GFI* = 0.91, *CFI* = 0.92, *NFI* = 0.89, *TLI* = 0.90, *RMSEA* = 0.08.

2.3 Data Analysis

Statistical analyses were performed using R Version 4.5.2. Harman's single-factor test was conducted via unrotated principal component analysis (PCA) using the *psych* and *GPArotation* packages. Descriptive statistics, Pearson correlation analyses, hierarchical regression analyses, and moderated mediation models were conducted using the *bruceR* package (Bao, 2025). Data visualizations were produced using *ggplot*2.

3 Results

3.1 Common Method Bias Test

To assess potential common method bias (CMB), Harman's single - factor test was conducted using PCA. The first unrotated factor accounted for only 16.14%, which is well below the recommended 40% critical threshold(Podsakoff et al. 2003). This indicates that common method bias does not pose a significant threat to the validity of the study findings.

3.2 Descriptive Statistics and Correlations

Descriptive statistics and Pearson correlations for all variables are summarized in Table 2. The mean score for willingness for intergroup contact (*M* = 3.82, midpoint = 3) was above the theoretical midpoint of 3 suggesting a generally positive behavioral intention toward individuals with disabilities. Correlation analyses provided preliminary support for the hypothesized model: willingness for intergroup contact was inversely related to disability stereotypes and intergroup anxiety (*rs* > **– 0**.34, *p*s < 0.001), while positively associated with contact frequency (*r* = 0.13, *p* < 0.001). Furthermore, overall empathy and its four subdimensions were all significantly and positively correlated with the outcome variable (*rs* > 0.07, *p*s < 0.005).

Table 2

Descriptive statistics and correlations among demographic and key variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. Age	—											
2. Gender	0.07**	—										
3. Grade	0.72***	0.14***	—									
4. Residence	−0.04	−0.02	0.08**	—								
5. Cont_Freq	0.01	−0.06*	0.02	−0.04	—							
6. Dis_Stereos	0.01	−0.03	0.05	−0.06*	−0.06*	—						
7. IInter_Anx	0.02	−0.15***	0.01	−0.10***	−0.10***	0.31***	—					
8. Emp	−0.06*	0.15***	−0.04	0.05*	0.03	−0.14***	−0.14***	—				
9. Emp_PT	−0.05	0.06*	−0.05*	0.03	0.04	−0.14***	−0.14***	0.71***	—			
10. Emp_FS	−0.06*	0.13***	−0.02	−0.02	−0.02	0.03	0.11***	0.64***	0.25***	—		
11. Emp_EC	−0.03	0.10***	−0.00	0.09***	−0.00	−0.12***	−0.18***	0.72***	0.35***	0.23***	—	
12. Emp_PD	−0.02	0.10***	−0.03	0.05*	0.07**	−0.17***	−0.22***	0.69***	0.40***	0.18***	0.39***	—
13. Inter_Willing	0.01	−0.00	−0.02	0.02	0.13***	−0.33***	−0.26***	0.34***	0.31***	0.07**	0.24***	0.34***
Mean	20.45	1.81	2.34	1.35	2.16	3.34	3.06	3.56	3.64	3.26	3.59	3.73
SD	1.66	0.4	1.07	0.48	0.69	0.7	0.97	0.41	0.62	0.73	0.56	0.49

Note. *N* = 1661; *SD* = Standard Deviation.

Cont_Freq = Contact Frequency; Dis_Stereo = Disability Stereotypes; Inter_Anx = Intergroup Anxiety; Emp = Empathy; Inter_Willing = Willingness for Intergroup Contact. Variables 9–12 in Matrix B are sub-dimensions of Empathy. Emp_PT = Perspective Taking; Emp_FS = Fantasy; Emp_EC = Empathic Concern; Emp_PD = Personal Distress.

*p < 0.05, **p < 0.01, ***p < 0.001.

<Table 2 about here>

3.3 Hierarchical Regression Analysis

Hierarchical multiple regression analyses were conducted to examine the predictive effects of key variables on willingness for intergroup contact, controlling for contact frequency (Hayes, 2017). Variance Inflation Factor (VIF) scores were calculated to assess multicollinearity. All Variance Inflation Factor (VIF) values ranged from 1.00 to 1.35, well below the recommended threshold of 5 (Hair et al., 2013), indicating that multicollinearity was not a concern in this study.

As shown in Table 3, in Model 1, revealed that disability stereotypes exerted a significant negative predictive effect on willingness for intergroup contact (βs > **−** **0**.33, ps < 0.001), accounting for an additional 11.7% of the variance. These findings support Hypothesis 1, suggesting that disability stereotypes exert a significant inhibitory effect on intergroup interaction. Model 2, which included intergroup anxiety and empathy as predictors, resulted in a significant increase in explanatory power ($\triangle R^2$= 10.4%). Model 3, which further decomposed empathy into its four subdimensions, explained an additional 2.1% of the variance ($\triangle R^2$ = 2.1%). Specifically, Perspective

Taking, Empathic Concern, and Personal Distress emerged as significant predictors (*ps* < 0.005). Collectively, these results indicate that intergroup anxiety and multidimensional empathy possess significant joint explanatory power regarding intergroup interaction, providing a rationale for the subsequent mediation and moderation analyses (see Fig. 2).

Table 3

Hierarchical Regression Results Predicting Undergraduate Students' Willingness for Intergroup Contact toward People with Disabilities

Independent Variables	**Model 1**			**Model 2**			**Model 3**		
	***β* (*SE*)**	***t***	***p***	***β* (*SE*)**	***t***	***p***	***β* (*SE*)**	***t***	***p***
Cont_Freq	0.11(0.02)	4.58	< 0.001***	0.09(0.02)	4.06	< 0.001***	0.08(0.02)	3.75	< 0.001***
Dis_Stereo	–0.32(0.02)	–13.97	< 0.001***	–0.24(0.02)	–10.50	< 0.001***	–0.23(0.02)	–10.800	< 0.001***
Inter_An				–0.14(0.02)	–6.08	< 0.001***	–0.11(0.02)	–4.78	< 0.001***
Emp				0.28(0.02)	12.91	< 0.001***			
Emp_PT							0.17(0.02)	6.86	< 0.001***
Emp_FS							0.00(0.02)	0.01	0.995
Emp_EC							0.07(0.02)	2.77	0.006**
Emp_PD							0.18(0.03)	7.25	< 0.001***
R^2(%)	11.9***			22.3***			24.4***		
F	$F_{(2,1658)}$ = 112.34, *p* < 0.001			$F_{(4, 1656)}$ = 119.09, *p* < 0.001			$F_{(7,1653)}$ = 76.21, *p* < 0.001		
$\triangle R^2$(%)	11.7			10.4			2.1		

Note. Model 0 (control Contact Frequency): $F_{(1, 1659)}$ = 26.46, *p* < 0.001***; R^2 = 0.02, *β*(*SE*) = 0.13(0.02), *t* = 5.14, *p* < 0.001.
Cont_Freq = Contact Frequency; Dis_Stereo = Disability Stereotypes; Inter_Anx = Intergroup Anxiety; Emp = Empathy; Inter_Willing = Willingness for Intergroup Contact. Emp_PT = Perspective Taking; Emp_FS = Fantasy; Emp_EC = Empathic Concern; Emp_PD = Personal Distress.

<Table 3 about here>

<Figure 2 about here>

3.4 Moderated Mediation Analysis

Following the computational procedures outlined by Hayes (2017), a moderated mediation analysis was conducted using the process function (model 15) integrated within the bruceR package. The model specified disability stereotypes as the independent variable (*X*), willingness for intergroup contact as the dependent variable (*Y*), intergroup anxiety as the mediator (*M*), and empathy as the moderator (*W*). Empathy was tested as a moderator on both the direct path (*X*→*Y*) and the second stage of the mediation process (*M*→*Y*). Contact frequency was included as a covariate throughout the analysis. Bias-corrected bootstrapping with 5000 resamples was utilized to estimate the 95% confidence intervals (CIs) for the indirect effects.

The analysis revealed a significant indirect effect of disability stereotypes on willingness for intergroup contact through intergroup anxiety (ab = **–** **0**.05, SE = 0.01, z = **–** **5**.95, *p* < 0.001, 95%CI [**–**0.07, **–** **0**.04]). Since the confidence interval did not include zero, the mediation effect was significant. The proportion of the total effect mediated by intergroup anxiety was 15.63% (indirect effect (ab) / total effect (c) = |**–**0.05| / |**–**0.32|). These findings support Hypothesis 2, indicating that intergroup anxiety partially mediates the negative impact of disability stereotypes on willingness for intergroup contact.

As presented in Table 4, the analysis tested H3a, which predicted that the strength of the direct relationship between disability stereotypes and willingness for intergroup contact would vary as a function of empathy. However, the interaction term (disability stereotypes × empathy) failed to reach statistical significance (p = 0.422). Therefore, the direct effect was not moderated by empathy, and Hypothesis 3a was not supported.

Table 4
Results of Moderated Mediation Effect Analysis

Regression Equation		**Overall Model Fit Indices**		**Significance Test of Regression Coefficients**		
Outcome Variable	Predictor Variable	R^2	F	β	t	Boot 95% *CI*
Inter_Anx (Mediator Model)	Dis_Stereo	0.11	70.47^{***}	0.29	12.53	[0.25, 0.34]
	Emp			−0.10	−4.26	[−0.14, − 0.03]
	Dis_Stereo × Emp			0.01	0.26	[−0.04, 0.05]
Inter_Intention (Outcome Model)	Dis_Stereo	0.23	71.35^{***}	−0.24	−10.51	[−0.29, − 0.20]
	Inter_Anx			−0.15	−6.43	[−0.19, − 0.10]
	Emp			0.28	12.73	[0.24, 0.32]
	Dis_Stereo × Emp			0.02	0.79	[−0.03, 0.07]
	Inter_Anx × Emp			0.07	2.81	[0.02, 0.11]

Note. Cont_Freq = Contact Frequency; Dis_Stereo = Disability Stereotypes; Inter_Anx = Intergroup Anxiety; Emp = Empathy; Inter_Intention = Intergroup Interaction Intention. Bootstrap 95% CI = 95% confidence interval based on 5000 bootstrap resamples.

<Table 4 about here>

In contrast to the non-significant findings for the direct path, results supported Hypothesis 3b, which predicted moderation of the second stage of the mediation model. While the main effects remained significant, the interaction term between empathy and intergroup anxiety significantly and positively predicted willingness for intergroup contact (β = 0.07, SE = 0.02, t = 2.87, p = 0.004). This indicates that empathy significantly moderates the path from intergroup anxiety to willingness for intergroup contact. Simple slope analyses (see Fig. 3) were conducted to probe this interaction. At low levels of empathy (M−1SD), intergroup anxiety exerted a robust negative effect on willingness for intergroup contact (β_{simple} = − 0.22, SE = 0.04, t = **−** **6**.13, p < 0.001, 95%CI [**−**0.29, **−** **0**.15]). Conversely, at high levels of empathy (M + 1 SD), although the negative effect remained statistically significant (β_{simple} = − 0.08, SE = 0.03, t = **−** **2**.48, p = 0.013, 95% CI [**−**0.14, **−** **0**.02]), the magnitude of this effect was attenuated by approximately 64.4% (calculated as (|−0.22| − |−0.08|) / |−0.22| ≈ 0.141 / 0.219 ≈ 64.4%). These results suggest that empathy serves a protective function: as empathy increases, the deleterious impact of intergroup anxiety on willingness for intergroup contact is substantially mitigated.

To further delineate the specific mechanisms underlying empathy's moderating role, we decomposed empathy into its four subdimensions and conducted separate moderated mediation analyses. The results revealed Perspective Taking and intergroup anxiety were not statistically significant (p = 0.169). However, significant moderation effects were observed for the other three dimensions. Regarding the magnitude of the buffering effect (ranked by the percentage of effect size reduction), Personal Distress demonstrated the strongest protective role (60.43%), followed by Fantasy (56.96%) and Empathic Concern (53.06%). Collectively, these findings suggest that the moderating effect of empathy is primarily driven by its affective and cognitive-simulation components (Fantasy, Empathic Concern, Personal Distress) rather than purely cognitive perspective-taking. This aligns with the Dynamic Model of Empathy, which emphasizes that affective arousal and self-other resonance—rather than mere intellectual understanding—are critical for regulating intergroup emotions and behaviors.

<Figure 3 about here>

To further validate the robustness of the findings and explore the protective role of behavioral factors, a moderate analysis was conducted to examine whether contact frequency (previously controlled as a covariate) moderates the relationship between intergroup anxiety and willingness for intergroup contact. This supplementary analysis was grounded in the premise that frequent intergroup contact may not only directly predict willingness for intergroup contact but also serve as a behavioral buffer, potentially mitigating the

inhibitory effect of intergroup anxiety. Given the significant correlation between contact frequency and willingness for intergroup contact, an additional analysis was conducted to examine its potential moderating role. As illustrated in Fig. 4, the interaction term between contact frequency and intergroup anxiety yielded a statistically significant positive effect on willingness for intergroup contact (β = 0.05, t = 2.17, p = 0.035). Simple slope analyses indicated that the magnitude of the negative relationship between intergroup anxiety and willingness for intergroup contact varied as a function of contact frequency. Specifically, at low levels of contact frequency (M−1SD), intergroup anxiety exerted a strong negative effect (β_{simple} = − 0.22, SE = 0.04, t = **− 6**.38, p < 0.001, 95%CI [**−**0.29, **− 0**.16]). In contrast, at high levels of contact frequency (M + 1SD), this negative effect was significantly attenuated by 42.15% (β_{simple} = − 0.13, SE = 0.03, t = − 4.19, p < 0.001, 95%CI [**−**0.19, **− 0**.07]), although it remained statistically significant. These findings imply that frequent intergroup contact serves as a protective factor, effectively buffering the adverse impact of intergroup anxiety on willingness for intergroup contact.

<Figure 4 about here>

4 Discussion

4.1 The Negative Predictive Effect of Disability Stereotypes on Willingness for Intergroup Contact

The current study revealed that disability stereotypes significantly and negatively predicted undergraduate students without disabilities' willingness to engage in intergroup contact with people with disabilities. Specifically, stronger endorsement of negative stereotypes toward people with disabilities corresponded to diminished willingness for intergroup contact. This finding confirms that disability stereotypes, as a core dimension of the non-disabled in-group's cognitive representation of the disability community, constitute a critical antecedent shaping willingness for intergroup contact. These results align with and extend prior research (Ai & Zhou, 2018; Stephan & Stephan, 2013; Zhang et al., 2021). For instance, Ai and Zhou (2018) observed that higher levels of stigmatization toward individuals with depression among high school students were associated with increased social distance. Similarly, using the Implicit Association Test (IAT), Zhang et al. (2021) identified robust negative stereotypes and attribution biases toward people of low socioeconomic status among college students, arguing that such biases form the cognitive foundation of group exclusion by eliciting aversion, deliberate avoidance, and objectification of marginalized groups.

A key question concerns the mechanism through which stereotypes influence intergroup behavioral intentions. Grounded in ITT, negative stereotypes function as a core antecedent of implicit intergroup prejudice through a three-stage sequential pathway involving the construction of negative behavioral expectations, the induction of threat perception, and the exacerbation of prejudice and intergroup conflict (Stephan & Stephan, 2013). Individuals initially form negative behavioral expectations about out-group members (e.g., anticipating communication barriers), which become consolidated into stable cognitive schemas through automatic cognitive processing. Subsequently, these expectations elicit perceived threats of negative interaction outcomes, implicitly framing the out-group as a source of interpersonal risk. Ultimately, such threat perceptions drive attitude polarization and behavioral avoidance, thereby intensifying intergroup prejudice and exclusion. Using a priming paradigm, Chen et al. (2025) further found that the impact of stereotypes on social interaction intentions is contingent on threat type, with group-concept threats exerting a stronger inhibitory effect on social approach tendencies than self-concept threats.

In the context of the current study, stronger negative disability stereotypes held by undergraduate students without disabilities (e.g., perceiving people with disabilities as inconvenient or eccentric) predict heightened expectations of negative interaction outcomes (e.g., social awkwardness or communication failure). Consequently, these students are more likely to perceive people with disabilities as a source of social threat, reducing their willingness for intergroup contact. Notably, the stronger the perceived group-concept threat (e.g., fear of validating the negative assumption that interactions with people with disabilities cannot be smooth and positive), the greater the reduction in approach-oriented intentions.

It is important to situate these findings within the bidirectional dynamics of intergroup interaction. Recent scholarship has extended this line of inquiry to examine how perceived stereotype threat shapes the social behaviors of people with disabilities and their families, elucidating the reciprocal nature of intergroup exclusion from the perspective of the marginalized group (Chan et al., 2023; Wang et al., 2024). For instance, Chan et al. (2023) conducted a two-year, three-wave longitudinal study of 441 parents of children with ASD, uncovering a ripple effect of stigmatization within the family ecosystem. Their results demonstrated that parental experiences of discrimination at Time 1 significantly predicted greater parental depression, harsh parenting, and coparenting conflict at Time 2, which

in turn predicted elevated internalizing and externalizing symptoms in children at Time 3. This body of work, when combined with the current findings, highlights that disability stereotypes drive a vicious cycle of intergroup exclusion: negative stereotypes among individuals without disabilities reduce their willingness for contact, while the resulting social isolation and stigma further reinforce the marginalization within the disability community.

4.2 The Mediating Role of Intergroup Anxiety

The findings indicate that intergroup anxiety partially mediates the relationship between disability stereotypes and willingness for intergroup contact. Specifically, disability stereotypes exert both a direct negative effect on willingness for intergroup contact and an indirect negative effect by exacerbating intergroup anxiety. These results align with prior theoretical and empirical work (Ai & Zhou, 2018; Guan et al., 2023; Stephan & Stephan, 2013). For example, Ai and Zhou (2018) observed that negative stereotypes and elevated intergroup anxiety jointly predicted greater social distance among high school students. Similarly, Guan et al. (2023) demonstrated that reducing intergroup anxiety effectively enhances willingness for interethnic contact.

Drawing on ITT, intergroup anxiety functions as an affective bridge linking perceived out-group threat to negative intergroup attitudes and behavioral intentions. It reflects a state of unease stemming from anticipated negative outcomes—such as rejection, social awkwardness, or interpersonal conflict—during intergroup interactions (Guan, 2017; Stephan & Stephan, 2013). Critically, this anxiety arises not from the out-group itself but from the anticipation of interactional risks. Threats triggered by out-group stereotypes (e.g., realistic threats, symbolic threats, and negative stereotypes) activate intergroup anxiety, which subsequently intensifies prejudice, discrimination, and avoidance behaviors. Mechanistically, this mediation pathway transforms cognitive threat perceptions into emotion-driven behavioral tendencies. In other words, negative stereotypes elicit elevated intergroup anxiety, which precipitates avoidance responses toward out-group members and impedes effective intergroup communication. Furthermore, once negative cognitive schemas are activated, individuals tend to amplify threat appraisals, reinforce feelings of interpersonal discomfort, and diminish interest in intergroup contact, ultimately undermining the establishment and maintenance of positive intergroup relations.

In the current study, negative disability stereotypes (e.g., perceived incompetence or communication difficulties) heighten perceived interaction risk, thereby triggering anxiety through the activation of threat appraisal mechanisms. This anxiety further narrows attentional scope, impeding individuals' ability to process positive cues during interactions while amplifying expectations of negative outcomes (e.g., social awkwardness or communication failure). Ultimately, motivation for proactive intergroup contact is reduced, and avoidance behaviors are more likely to occur. Notably, intergroup anxiety toward people with disabilities manifests predominantly as uncertainty-based anxiety (e.g., fear of behaving inappropriately) rather than overt hostility-based anxiety (Canton et al., 2023). This phenomenon is inextricably linked to the social cognitive framing of the disability community as a group requiring special interactional strategies. Such cognitive distinctiveness predisposes stereotype-activated anxiety to manifest as implicit alienation (i.e., avoidance) rather than direct conflict. Consequently, to enhance positive intergroup interactions between undergraduate students without disabilities and people with disabilities, interventions must go beyond merely correcting negative stereotypes at the cognitive level but should also address affective processes—particularly uncertainty-based anxiety. Interventions that reduce concerns about interactional impropriety and implicit alienation behaviors may be especially effective in fostering willingness for proactive intergroup contact.

4.3 The Moderating Roles of Empathy and Contact Frequency

The current study further revealed that empathy did not moderate the direct path from disability stereotypes to willingness for intergroup contact; however, it significantly moderated the second stage of the mediation pathway (intergroup anxiety → willingness for intergroup contact). Specifically, at high levels of empathy, the deleterious impact of intergroup anxiety on willingness for intergroup contact is significantly attenuated, compared to low levels of empathy. These findings validate the buffering role of empathy in intergroup interactions, aligning with prior empirical studies (Canioz & Coskun, 2019; Tan et al., 2025). Utilizing questionnaires and emotional priming experiments, Tan et al. (2025) demonstrated that both trait and state empathy amplify the facilitative effect of moral judgment on altruistic behavior. Similarly, Johnson et al. (2008) found that empathy significantly mitigates the interactive effect of contact quality and discrimination expectations on prosocial intergroup attitudes.

Drawing on the Empathy-Altruism Hypothesis (Batson, 1987), higher empathy among undergraduate students without disabilities facilitates the formation of congruent emotional experiences via affective resonance (e.g., resonating with the social exclusion experienced by people with disabilities). This emotional state, operationalized as empathic concern (i.e., other-oriented compassion and care for the welfare of others), activates altruistic motivation. Consequently, individuals shift their focus from avoiding personal social discomfort to ameliorating the social plight of people with disabilities. Thus, driven by altruistic motivation, students with high empathy exhibit reduced prejudice, more positive intergroup attitudes, and greater willingness for proactive intergroup contact.

Notably, the moderating effect of Perspective Taking was non-significant, whereas the remaining three subdimensions, Personal Distress, Fantasy, and Empathic Concern, exerted significant buffering effects. According to Davis (1996), Perspective Taking represents a purely cognitive component of empathy, involving the intellectual understanding of another's perspective (e.g., comprehending the social challenges faced by people with disabilities). Lacking affective arousal, it fails to activate the motivational system required to drive attitudinal or behavioral regulation, thus diminishing its moderating potential. In contrast, Personal Distress (self-oriented emotional discomfort) and Empathic Concern (other-oriented concern) directly involve affective processes that can activate motivational drives. Similarly, Fantasy, although cognitive in form, facilitates affective resonance via cognitive simulation of others' experiences, thereby indirectly linking to behavioral motivation. Within intergroup interactions, the regulation of attitudes and behavioral intentions requires affective arousal capable of disrupting rigid negative stereotypes. Consequently, the three affect-laden dimensions exert significant moderating effects by establishing emotional bonds with the out-group, whereas purely cognitive Perspective Taking fails to exert an influence due to the absence of affective engagement.

Furthermore, supplementary analyses revealed that the frequency of prior contact with people with disabilities—a demographic variable positively associated with willingness for intergroup contact—significantly buffered the negative association between intergroup anxiety and willingness for intergroup contact. This finding is consistent with Intergroup Contact Theory (Islam & Hewstone, 1993), which posits that frequent contact between members of distinct social groups, under conditions of equal status, shared superordinate goals, intergroup cooperation, and institutional support, can effectively reduce intergroup prejudice. Contact improves intergroup attitudes by mitigating intergroup anxiety, dismantling negative stereotypes, and fostering positive cognitive schemas and emotional bonds with the out-group. Both the frequency and quality of contact are pivotal, specifically high-quality contact being more effective in dissolving intergroup barriers via affective resonance (Branco et al., 2025; Gao & Wan, 2018). For example, Gao and Wan (2018) found that increased contact between ethnic minority and majority groups indirectly promoted positive intergroup interaction by reducing intergroup anxiety and mitigating negative stereotypes. Consequently, frequent prior contact enhances positive affect toward the out-group by reducing anxiety and weakening endorsement of stereotypes. This, in turn, attenuates the inhibitory effect of anxiety on willingness for intergroup contact, further corroborating the central role of intergroup contact in improving intergroup relations.

4.4 Practical Implications, Limitations, and Future Directions

The findings of this study provide targeted practical guidance for promoting positive intergroup interactions between undergraduate students without disabilities and people with disabilities and advancing the social inclusion of people with disabilities. First, targeting the robust negative predictive effect of disability stereotypes on willingness for intergroup contact, higher education institutions should integrate disability-inclusive education into general curricula and create structured, equal-status cooperative contact opportunities between students with and without disabilities. These measures can effectively reduce ingrained negative stereotypes, deepen students' understanding of the disability community, and increase their willingness for intergroup contact. Second, given the partial mediating role of intergroup anxiety, campus psychological service centers should carry out targeted group counseling and social skill training for undergraduate students to alleviate students' uncertainty and anxiety about intergroup interactions and negative cognitive and emotional biases toward people with disabilities and further enhance their willingness for intergroup contact. Third, given the significant buffering effect of empathy, targeted empathy training should be implemented for undergraduate students, with a focus on cultivating the affective dimensions of empathy. Such training can effectively mitigate the inhibitory effect of intergroup anxiety on willingness for intergroup contact and facilitate the establishment of harmonious intergroup relationships.

This study has two core limitations that suggest directions for future research. First, it examined explicit disability stereotypes among undergraduate students without disabilities, without measuring implicit stereotypes. Future research can simultaneously explore the dual influencing paths of explicit and implicit disability stereotypes on willingness for intergroup contact to better understand the implicit cognitive mechanisms of intergroup avoidance. Second, this cross-sectional design limits causal relationships between the study variables and does not capture the dynamic changes of intergroup attitudes over time. Longitudinal or multi-wave designs are needed to validate the proposed moderated mediation model and clarify causal relationships among variables.

5 Conclusion

This study constructed and tested a moderated mediation model of willingness for intergroup contact with people with disabilities among undergraduate students without disabilities. The main conclusions are as follows:

(1) Disability stereotypes significantly and negatively predict undergraduate students without disabilities' willingness to engage in intergroup contact with people with disabilities.

(2) Intergroup anxiety partially mediates the relationship between disability stereotypes and willingness for intergroup contact.

(3) Empathy significantly moderates the second stage of the mediation pathway (intergroup anxiety → intergroup contact willingness), with the buffering effect driven mainly by affective (rather than cognitive) empathy dimensions. Additionally, greater prior contact frequency with people with disabilities weakens intergroup anxiety's inhibitory effect on willingness for intergroup contact.

Abbreviations

ITT Integrated Threat Theory

CFA Confirmatory Factor Analysis

SCM Stereotype Content Model

Declarations

Supplementary Materials: All scales used in this study are available for download at the Open Science Framework (OSF; https://osf.io/bzgm8/files/osfstorage).

Data Availability Statement: Data and analytical code supporting the findings of this study are accessible via the Open Science Framework (OSF;
https://osf.io/bzgm8/files/ osfstorage).

Institutional Review Board Statement: This study followed the Declaration of Helsinki and was approved by the IRB of the School of Psychology, Xinjiang Normal University (XLXY2024021) on June 1, 2024. Informed consent was obtained from all participants.

Conflicts of Interest: The authors declare no conflicts of interest, and funders had no role in the research.

Funding: This work was supported by the Western Project of the National Social Science Fund of China for Education Science, under Grant Number BMX230345.

Author Contributions: Conceptualization, W.-Y. and Z.-X.Y.; methodology, W.-Y. and L.-X.Y.; software, W.-Y.; validation, W.-Y., L.-X.Y. and J.-C.; formal analysis, W.-Y.; investigation, W.-Y., L.-X.Y., J.-C. and Y.-X.Y.; resources, Z.-X.Y.; data curation, W.-Y.; writing—original draft preparation, W.-Y.; writing—review and editing, W.-Y., L.-X.Y., Y.-X.Y., J.-C. and Z.-X.Y.; visualization, W.-Y.; supervision, Z.-X.Y.; project administration, Z.-X.Y.; funding acquisition, Z.-X.Y. All authors have read and agreed to the published version of the manuscript.

Acknowledgments: Special thanks to all participants for their engagement and support.

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Figures

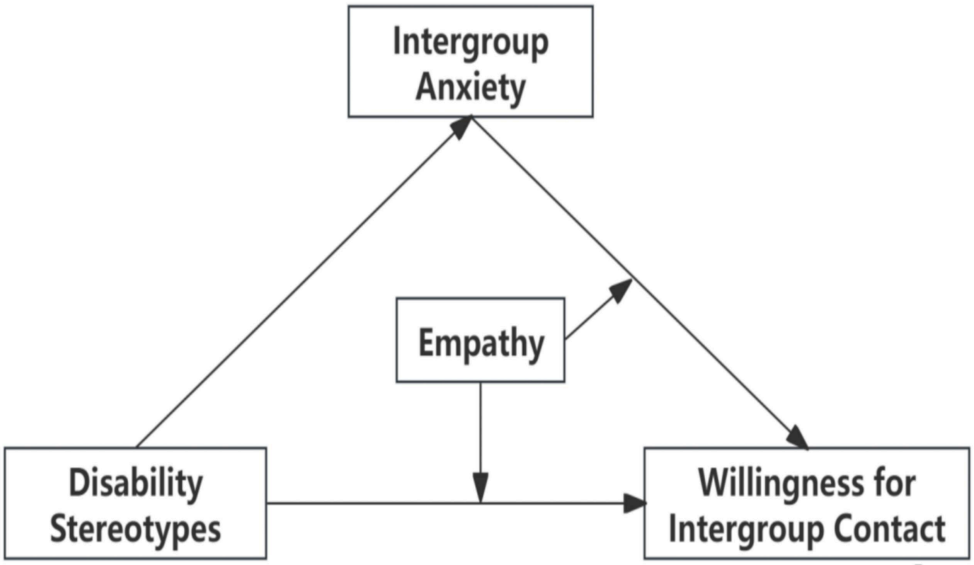


Figure 1

The hypothesized moderated mediation model

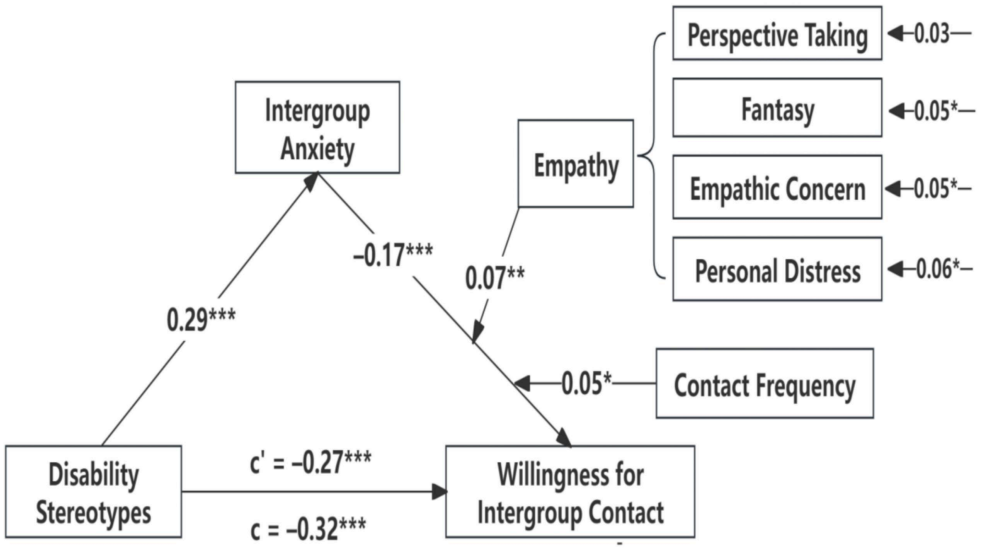


Figure 2

The Mediating Effect of Intergroup Anxiety and Moderating Effect of Empathy

Note. The values on the right of the four dimensions of empathy represent the effect sizes (β) of the interaction terms between each empathy dimension and intergroup anxiety on intergroup interaction intention.

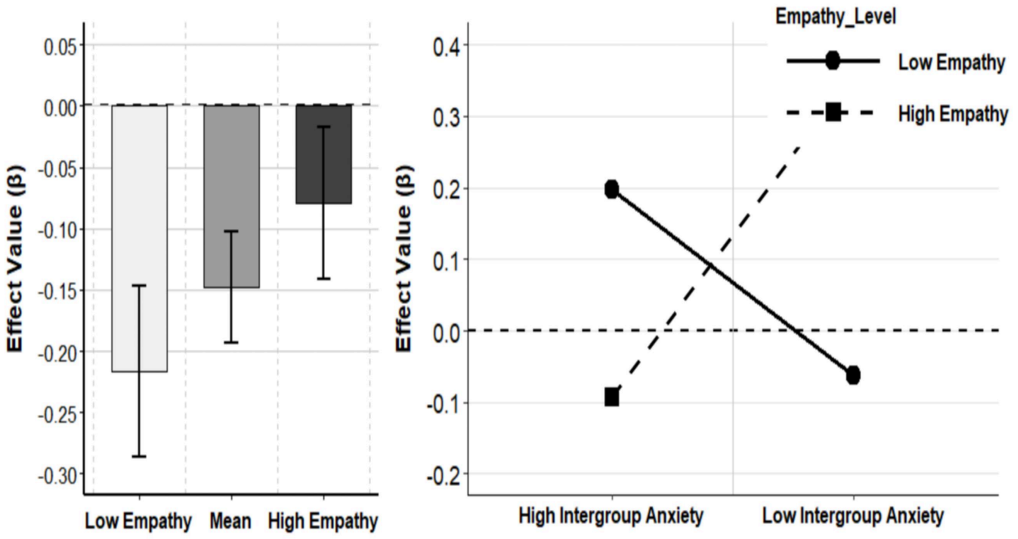


Figure 3

Moderating Effect of Empathy on the Relationship Between Intergroup Anxiety and Willingness for Intergroup Contact

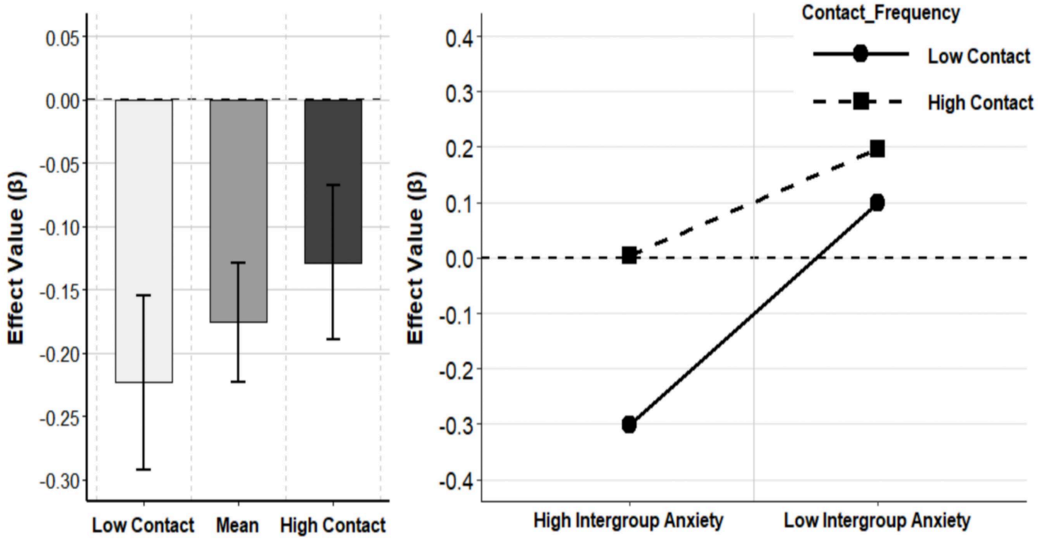


Figure 4

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- SupplementaryMaterial.rar