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Structural Relationship Between Social Comparison and Bullying with the Experience of Schadenfreude Considering the Mediating Role of Social Dominance Orientation in Medical Residents

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A B S T R A C T

The present study aimed to examine the structural relationships between social comparison and bullying with schadenfreude experience, considering the mediating role of social dominance orientation among medical residents This study employed a descriptive–analytical design using structural equation modeling with a partial least squares (PLS-SEM) approach. The statistical population consisted of all medical residents (N = 177) at Rasul Akram Hospital affiliated with Iran University of Medical Sciences in 2025, from which a final sample of 73 participants was selected using stratified random sampling based on academic year and specialty. Data were collected using standardized self-report instruments, including the Social Comparison Scale, Workplace Bullying Questionnaire, Schadenfreude Scale, and Social Dominance Orientation Scale, along with a demographic questionnaire. Data analysis was conducted using SPSS-26 and SmartPLS-3, including descriptive statistics, Pearson correlation, and evaluation of measurement and structural models through reliability, validity, and path analysis indices. The results indicated that social comparison had a significant positive effect on schadenfreude experience (β = 0.337, t = 2.96, p = 0.003), and social dominance orientation also significantly predicted schadenfreude (β = 0.340, t = 2.37, p = 0.018). However, the direct effect of bullying on schadenfreude was not statistically significant (β = 0.258, t = 1.80, p = 0.070). Additionally, neither social comparison (β = 0.147, t = 1.34, p = 0.180) nor bullying (β = 0.231, t = 0.92, p = 0.358) significantly predicted social dominance orientation. The indirect effects of social comparison and bullying on schadenfreude through social dominance orientation were not significant, indicating the absence of a mediating effect. The findings suggest that schadenfreude among medical residents is primarily influenced by social comparison processes and individual differences in social dominance orientation, while bullying does not exert a significant direct or indirect effect. These results highlight the importance of cognitive-evaluative and ideological factors over situational interpersonal stressors in explaining counter-empathic emotional responses within professional medical environments.

Keywords: *Schadenfreude, Social Comparison, Workplace Bullying, Social Dominance Orientation, Medical Residents*

1. Introduction

The experience of schadenfreude, defined as the pleasure derived from others' misfortunes, has increasingly attracted scholarly attention as a complex socio-emotional phenomenon embedded within interpersonal and intergroup dynamics. Traditionally conceptualized as a morally ambivalent emotion, schadenfreude reflects underlying cognitive and affective processes such as envy, competition, and social comparison, which shape how individuals interpret and respond to the successes and failures of others. Contemporary research has moved beyond descriptive accounts and has begun to investigate the structural and psychological determinants of schadenfreude, particularly within professional and high-stakes environments where interpersonal evaluation and hierarchical positioning are salient. In this context, understanding schadenfreude among medical residents is especially important, as these individuals operate within competitive, high-pressure settings that may amplify social comparison and interpersonal tensions (Suter & Döveling, 2024; Yeganeh, 2022).

Social comparison theory provides a foundational framework for understanding the emergence of schadenfreude. Individuals constantly evaluate themselves in relation to others in order to assess their own abilities, opinions, and social standing. These comparisons can lead to upward or downward evaluations, each associated with distinct emotional consequences. When individuals perceive themselves as inferior to others, feelings of envy and resentment may arise, whereas the misfortune of a superior target can trigger schadenfreude as a compensatory emotional response. Empirical evidence suggests that social comparison processes are deeply rooted in neural and cognitive systems, influencing emotional reactions in real time and shaping social behavior in both conscious and unconscious ways (Boecker et al., 2022; Li et al., 2025). Furthermore, the intensity and direction of social comparison are influenced by contextual factors such as competition, performance evaluation, and perceived similarity, all of which are prevalent in medical training environments.

Closely related to social comparison is the construct of bullying, particularly within organizational and professional settings. Workplace bullying encompasses repeated negative acts such as exclusion, humiliation, and excessive criticism, which can significantly affect individuals' psychological well-being and social functioning. In highly hierarchical systems like hospitals, where power asymmetries and performance pressures are pronounced, bullying behaviors may become normalized or overlooked. Research indicates that exposure to bullying not only leads to adverse outcomes such as stress and burnout but also influences interpersonal attitudes and emotional responses, potentially increasing tendencies toward counter-empathic emotions such as schadenfreude (Scott & Barlett, 2023; Widyastika & Anisah, 2023). Additionally, bullying can create an environment in which individuals become desensitized to others' suffering or even derive satisfaction from it, particularly when such suffering is perceived as justified or deserved.

Another critical variable in understanding these dynamics is social dominance orientation (SDO), which reflects an individual's preference for hierarchical social structures and group-based inequality. Individuals high in SDO tend to endorse dominance, competition, and power asymmetries, which can shape their emotional and behavioral responses toward others. Research has consistently shown that SDO is associated with reduced empathy, increased prejudice, and greater support for aggressive or exclusionary behaviors. Importantly, SDO has been linked to both bullying and schadenfreude, suggesting that it may serve as a key psychological mechanism connecting these constructs (Gordon, 2021; Hudson et al., 2022). Individuals with high SDO are more likely to interpret others' misfortunes as reinforcing existing hierarchies, thereby experiencing positive emotions in response to such events.

Recent studies have further highlighted the role of SDO in shaping responses to social inequality and interpersonal conflict. For example, research demonstrates that individuals with higher SDO are more likely to engage in or tolerate aggressive behaviors, including cyberbullying and peer victimization, particularly when these behaviors reinforce perceived social hierarchies (Amadori et al., 2025; Chen et al., 2023). Similarly, SDO has been identified as a predictor of aggression in digital and real-world contexts, mediated by factors such as moral disengagement and online disinhibition (Gan et al., 2024). These findings underscore the relevance of SDO as a mediating variable in the relationship between social comparison, bullying, and schadenfreude, as it captures underlying ideological orientations that influence how individuals interpret and respond to social interactions.

The interplay between empathy and counter-empathy is also central to understanding schadenfreude. While empathy involves sharing and understanding others' emotional states, counter-empathic responses such as schadenfreude represent

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a reversal of this process, wherein individuals experience pleasure rather than distress in response to others' suffering. Studies have shown that these emotional responses are not mutually exclusive but are shaped by factors such as group membership, perceived fairness, and ideological beliefs. For instance, individuals are more likely to experience schadenfreude toward outgroup members or individuals perceived as competitors, particularly when these targets are seen as responsible for their own misfortunes (Hudson & Uenal, 2022; Wakefield & Wakefield, 2023). Moreover, the balance between empathy and counter-empathy is influenced by personality traits, social context, and situational cues, highlighting the complexity of emotional processing in social environments.

In professional settings such as medical residency programs, these dynamics may be particularly pronounced. Medical residents are frequently exposed to intense competition, performance evaluations, and hierarchical relationships, all of which can foster social comparison and influence interpersonal behavior. The demanding nature of medical training may also contribute to emotional fatigue and reduced empathic capacity, increasing the likelihood of counter-empathic responses. Additionally, the presence of bullying behaviors, whether overt or subtle, can further exacerbate these tendencies by creating an environment characterized by mistrust and competition. Understanding how these factors interact to influence schadenfreude is essential for promoting healthier interpersonal dynamics and improving the overall well-being of medical professionals (Gotdiner & Gumpel, 2023; Vera et al., 2023).

Recent research has also emphasized the role of contextual and developmental factors in shaping SDO and related behaviors. For example, early experiences of social rejection and parental bonding have been shown to influence individuals' orientation toward dominance and hierarchy, which in turn affects their responses to social interactions and conflicts (Maor, 2024a; Tolomeo, 2025). Similarly, educational and institutional environments play a critical role in reinforcing or challenging hierarchical beliefs and behaviors. In medical settings, where authority structures are deeply embedded, these influences may be particularly strong, shaping both individual attitudes and organizational culture.

Furthermore, emerging evidence suggests that schadenfreude is not merely a passive emotional response but can actively influence behavior and decision-making. For instance, individuals who experience schadenfreude may be more likely to engage in competitive or aggressive behaviors, reinforcing cycles of conflict and inequality. In educational and professional contexts, this can have significant implications for teamwork, collaboration, and overall performance. Studies have also shown that schadenfreude is associated with achievement motivation and competitive dynamics, particularly in environments where individuals are evaluated based on relative performance (Simamora, 2021a, 2021b). These findings highlight the importance of examining schadenfreude not only as an emotional outcome but also as a factor influencing broader social and organizational processes.

At the same time, the measurement and conceptualization of schadenfreude have evolved significantly in recent years, with new instruments and theoretical models providing more nuanced insights into its structure and determinants. For example, recent scale development studies have emphasized the multidimensional nature of schadenfreude, capturing variations in intensity, context, and underlying motivations (Kato & Izumi, 2025). These advances have facilitated more sophisticated analyses of schadenfreude within structural models, enabling researchers to examine its relationships with other psychological constructs in greater detail.

Despite these developments, there remains a relative lack of research examining the integrated relationships among social comparison, bullying, and schadenfreude within professional populations, particularly with consideration of mediating mechanisms such as social dominance orientation. While existing studies have explored these variables individually or in limited combinations, few have adopted a comprehensive structural modeling approach to investigate their interconnections. Moreover, the specific context of medical residency, with its unique combination of stressors, hierarchies, and interpersonal dynamics, has been largely overlooked in this line of research. Addressing this gap is critical for advancing both theoretical understanding and practical interventions aimed at improving professional environments and individual well-being (Heering, 2024; Maor, 2024b).

In addition, broader societal and technological changes have intensified the relevance of these constructs. The increasing role of digital communication, social media, and online interactions has expanded the contexts in which social comparison and bullying occur, often amplifying their effects. Online environments can facilitate disinhibition and reduce accountability, increasing the likelihood of aggressive behaviors and counter-empathic responses. At the same time, these platforms provide new opportunities for observing and reacting to others' successes and failures,

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potentially enhancing the frequency and intensity of schadenfreude experiences (Chan & Poon, 2024; Wankmüller, 2025).

Taken together, the literature suggests that schadenfreude is a multifaceted phenomenon shaped by a complex interplay of cognitive, emotional, and social factors, including social comparison, bullying, and social dominance orientation. Understanding these relationships within the context of medical residency is essential for developing interventions that promote empathy, reduce harmful behaviors, and enhance professional well-being.

The aim of the present study is to examine the structural relationships between social comparison and bullying with schadenfreude experience, considering the mediating role of social dominance orientation among medical residents.

2. Methods and Materials

2.1. Study Design and Participants

The present study employed a descriptive–analytical design and was conducted using structural equation modeling with a partial least squares (PLS-SEM) approach. This methodological framework was selected due to its robustness in analyzing complex multivariate relationships among latent constructs and its suitability for studies with relatively small to moderate sample sizes. The conceptual model of the study aimed to examine the structural relationships between social comparison and workplace bullying as exogenous variables, schadenfreude experience as the endogenous variable, and social dominance orientation as a mediating construct among medical residents.

The statistical population consisted of all medical residents enrolled in training programs at Rasul Akram Hospital, affiliated with Iran University of Medical Sciences, during the year 2025. This hospital was selected as the study setting due to its status as a major teaching and referral medical center and the presence of a large and diverse population of residents across multiple medical specialties. In total, 177 residents constituted the accessible population.

Sampling was conducted using a stratified random sampling technique to ensure adequate representation across different subgroups. Initially, the hospital was selected randomly among teaching hospitals. Subsequently, the residents were stratified based on their academic year (first through fourth year) and their medical specialty fields. From each stratum, participants were randomly selected using random number tables or computerized randomization procedures. This approach enhanced the representativeness of the sample and minimized selection bias, thereby improving the external validity of the findings.

The sample size was determined based on the rule-of-thumb proposed for PLS-SEM, which suggests that the minimum sample size should be at least ten times the maximum number of structural paths directed at any latent construct in the model. In the present study, the dependent variable, schadenfreude experience, had three incoming paths (from social comparison, bullying, and social dominance orientation), indicating a minimum sample size of 30 participants. However, to increase statistical power, enhance model estimation accuracy, and compensate for potential data loss due to incomplete responses, an initial sample size of approximately 70 to 80 participants was targeted. After data screening and exclusion of incomplete or invalid responses from the initial 177 distributed questionnaires, the final sample consisted of 73 medical residents.

Inclusion criteria required participants to be currently enrolled medical residents at Rasul Akram Hospital, to have at least six months of clinical experience to ensure familiarity with the hospital environment, to provide informed consent for voluntary participation, and to complete all sections of the questionnaires accurately. Exclusion criteria included incomplete or inconsistent questionnaire responses, withdrawal of consent at any stage, the presence of psychological or physical conditions that could interfere with valid participation, ethical concerns raised by participants, and concurrent involvement in similar research studies that could introduce bias.

2.2. Measures

Data were collected using a set of standardized self-report questionnaires along with a demographic information form. The Social Comparison Scale, developed by Gibbons and Buunk, was used to assess individual differences in the tendency toward social comparison. This instrument consists of 11 items organized into two subscales: ability comparison and opinion comparison. Responses are recorded on a seven-point Likert scale, and higher scores indicate a greater tendency toward social comparison. Previous studies have reported satisfactory reliability and validity for this scale, and its Persian version has demonstrated acceptable psychometric properties.

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Workplace bullying was measured using the Negative Acts Questionnaire developed by Einarsen and colleagues. This instrument includes 22 items assessing three dimensions: work-related bullying, personal bullying, and physical intimidation. Responses are rated on a five-point Likert scale ranging from "never" to "always," with higher scores reflecting greater exposure to bullying behaviors. The scale has demonstrated high internal consistency and construct validity in both international and Iranian contexts.

The experience of schadenfreude was assessed using a validated Persian version of the Schadenfreude Scale, which measures the intensity of pleasure derived from others' misfortunes across various life scenarios. The instrument comprises 15 items organized into five domains: wealth, love, competition, beauty, and ability. Each item is rated on a seven-point Likert scale, and higher total scores indicate greater levels of schadenfreude. The scale has shown strong psychometric properties, including acceptable reliability coefficients and a well-established factorial structure.

Social dominance orientation was measured using the Social Dominance Orientation Scale developed by Sidanius and Pratto. This scale includes 16 items assessing individuals' preference for hierarchical social structures and group-based inequality. Responses are rated on a five-point Likert scale, with some items reverse-coded. Higher scores indicate stronger endorsement of social dominance beliefs. The scale has demonstrated adequate reliability and construct validity across different populations, including adapted versions used in Iranian samples.

Additionally, a demographic questionnaire was used to collect information on participants' age, gender, marital status, number of children, economic status, and duration of residency training in months. These variables were included as control variables to provide contextual understanding of the sample characteristics.

2.3. Data analysis

Data analysis was conducted using SPSS version 26 and SmartPLS version 3. Initially, descriptive statistics were calculated to summarize the demographic characteristics of the sample, including frequencies, percentages, means, and standard deviations. For the main study variables, descriptive indices such as mean, standard deviation, skewness, and kurtosis were examined to assess the distributional properties of the data. Pearson correlation coefficients were computed to evaluate the bivariate relationships among variables at significance levels of 0.05 and 0.01.

The structural equation modeling analysis was performed using the PLS-SEM approach, which is particularly suitable for predictive modeling and complex path structures. The analysis proceeded in two main stages: evaluation of the measurement model and evaluation of the structural model. In the measurement model, internal consistency reliability was assessed using Cronbach's alpha and composite reliability, with acceptable thresholds of 0.70 or higher. Indicator reliability was examined through factor loadings, with values above 0.40 considered acceptable. Convergent validity was assessed using the average variance extracted (AVE), with values exceeding 0.50 indicating adequate convergence.

Discriminant validity was evaluated using the Fornell–Larcker criterion, whereby the square root of the AVE for each construct was compared with its correlations with other constructs. Multicollinearity was assessed using the variance inflation factor (VIF), with values below 2.5 indicating the absence of significant collinearity issues.

In the structural model, path coefficients, t-values, and significance levels were examined to test the study hypotheses. The mediating effect of social dominance orientation was assessed using bootstrapping procedures to estimate indirect effects and their statistical significance. Model fit and predictive relevance were also evaluated using appropriate PLS-SEM indices to ensure the robustness and explanatory power of the proposed model.

3. Findings and Results

The demographic characteristics of the participants indicated that out of the total sample of 73 medical residents, 28 participants (38.4%) were male and 45 participants (61.6%) were female, reflecting a higher proportion of female residents in the study. Regarding marital status, 31 individuals (42.5%) were single, while 42 participants (57.5%) were married, indicating that the majority of the sample were married. In terms of the number of children, most participants (49 individuals, 67.0%) had no children, whereas 17 participants (23.3%) reported having one child and 7 participants (9.6%) had two children. Economic status distribution showed that the majority of participants (50 individuals, 68.5%) reported a moderate economic status, followed by 19 participants (26.0%) who reported a good economic status, while only 2 participants (2.7%) reported low economic status and another 2 participants (2.7%)

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reported a very good economic status. With respect to continuous demographic variables, the mean age of participants was 32.8 years (SD = 5.7), with skewness and kurtosis values of 0.24 and 0.50, respectively, indicating an approximately normal distribution. Additionally, the mean duration of residency training was 28.23 months (SD = 24.06), with skewness of 1.00 and kurtosis of 1.88, suggesting a slightly positively skewed distribution.

Table 1

Descriptive Statistics of Research Variables

Variable / Dimensions	Mean	Standard Deviation	Skewness	Kurtosis
Social Comparison	51.85	9.95	-0.367	-0.314
Opinions	24.92	5.06	-0.306	-0.267
Ability	26.93	6.50	-0.477	-0.266
Bullying	28.53	13.49	0.48	-0.033
Physical	2.46	2.76	1.09	0.704
Work-related	13.08	5.01	-0.103	0.669
Personal	12.98	8.88	0.799	0.087
Social Dominance Orientation	47.20	8.36	0.483	1.38
Dominance over Others	22.67	6.03	0.273	0.809
Preference for Inequality	24.53	4.40	0.309	0.411
Schadenfreude Experience	16.37	6.09	0.273	0.521
Wealth	3.58	1.45	-0.196	-0.233
Love	2.71	1.44	0.494	-0.250
Competition	3.32	1.59	0.195	-0.640
Beauty	3.22	1.54	0.407	0.052
Ability	3.52	1.58	-0.114	-0.634

The descriptive statistics presented in Table 1 indicate that the mean score for social comparison among medical residents was 51.85 (SD = 9.95), with slightly negative skewness and kurtosis values, suggesting a relatively symmetric distribution. Among its subdimensions, ability (M = 26.93, SD = 6.50) showed a higher mean compared to opinions (M = 24.92, SD = 5.06). The overall mean of bullying was 28.53 (SD = 13.49), with the work-related dimension (M = 13.08, SD = 5.01) slightly higher than the personal (M = 12.98, SD = 8.88) and physical (M = 2.46, SD = 2.76) dimensions; notably, physical bullying exhibited higher positive skewness (1.09), indicating that lower scores were more frequent. Social dominance orientation had a mean of 47.20 (SD = 8.36), with its subcomponents showing comparable values, including dominance over others (M = 22.67, SD = 6.03) and preference for inequality (M = 24.53, SD = 4.40). The mean score of schadenfreude experience was 16.37 (SD = 6.09), with its highest subdimension observed in wealth (M = 3.58, SD = 1.45) and lowest in love (M = 2.71, SD = 1.44). Overall, skewness and kurtosis indices across variables were within acceptable ranges, indicating no severe deviations from normality and supporting the suitability of the data for subsequent parametric and structural equation modeling analyses.

Table 2

Correlation Matrix of Research Variables

Variables	Schadenfreude Experience	Social Comparison	Bullying
Schadenfreude Experience	—	—	—
Social Comparison	0.353**	—	—
Bullying	0.289*	0.225*	—
Social Dominance Orientation	0.240*	0.271*	0.243*

The correlation matrix presented in Table 2 indicates that schadenfreude experience is positively and significantly correlated with social comparison ($r = 0.353$, $p < 0.01$) and bullying ($r = 0.289$, $p < 0.05$). Additionally, social comparison shows a significant positive relationship with bullying ($r = 0.225$, $p < 0.05$). Social dominance orientation is also positively associated with schadenfreude experience ($r = 0.240$, $p < 0.05$), social comparison ($r = 0.271$, $p < 0.05$), and bullying ($r = 0.243$, $p < 0.05$). These findings suggest that higher levels of social comparison and bullying are

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associated with increased schadenfreude, while social dominance orientation appears to be related to all primary study variables, supporting its potential mediating role in the structural model.

Table 3

Factor Loadings of Observed Variables

Construct	Dimension	Factor Loading
Schadenfreude Experience	Wealth	0.709
	Love	0.847
	Competition	0.770
	Beauty	0.853
	Ability	0.803
Social Dominance Orientation	Dominance over Others	0.402
	Preference for Inequality	0.993
Bullying	Physical	0.691
	Work-related	0.852
	Personal	0.739
Social Comparison	Opinions	0.698
	Ability	0.961

As shown in Table 3, all observed variables demonstrated acceptable factor loadings, generally exceeding the minimum threshold of 0.40. Among the dimensions of schadenfreude experience, beauty (0.853) and love (0.847) exhibited the highest loadings, indicating strong contributions to the latent construct. In the social dominance orientation construct, preference for inequality showed an exceptionally high loading (0.993), while dominance over others had a relatively lower but still acceptable loading (0.402). For bullying, the work-related dimension had the highest loading (0.852), followed by personal (0.739) and physical (0.691). In the case of social comparison, ability (0.961) demonstrated a very strong loading compared to opinions (0.698). Overall, the results confirm the adequacy of the measurement model in representing the latent constructs.

Table 4

Cronbach's Alpha of Research Variables

Variable	Cronbach's Alpha	Status
Schadenfreude Experience	0.857	Acceptable
Social Dominance Orientation	0.721	Acceptable
Bullying	0.781	Acceptable
Social Comparison	0.743	Acceptable

The reliability results presented in Table 4 indicate that all research variables achieved acceptable levels of internal consistency. Schadenfreude experience demonstrated the highest Cronbach's alpha (0.857), indicating strong reliability, followed by bullying (0.781) and social comparison (0.743). Social dominance orientation also showed acceptable reliability (0.721), exceeding the commonly accepted threshold of 0.70. These findings confirm that the measurement instruments used in the study are reliable and suitable for further analysis.

Table 5

Composite Reliability of Research Variables

Variable	Composite Reliability	Status
Schadenfreude Experience	0.897	Acceptable
Social Dominance Orientation	0.783	Acceptable
Bullying	0.806	Acceptable
Social Comparison	0.824	Acceptable

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As indicated in Table 5, the composite reliability values for all constructs exceeded the recommended threshold of 0.70, confirming satisfactory internal consistency. Schadenfreude experience had the highest composite reliability (0.897), followed by social comparison (0.824), bullying (0.806), and social dominance orientation (0.783). These results further support the robustness and reliability of the measurement model.

Table 6

Convergent Validity of Research Variables

Variable	AVE (Convergent Validity)	Status
Schadenfreude Experience	0.637	Acceptable
Social Dominance Orientation	0.564	Acceptable
Bullying	0.583	Acceptable
Social Comparison	0.706	Acceptable

The results presented in Table 6 show that all constructs achieved acceptable levels of convergent validity, as indicated by average variance extracted (AVE) values exceeding the threshold of 0.50. Social comparison demonstrated the highest AVE (0.706), followed by schadenfreude experience (0.637), bullying (0.583), and social dominance orientation (0.564). These findings indicate that the constructs explain a substantial proportion of the variance in their respective indicators.

Table 7

Discriminant Validity Based on Fornell–Larcker Criterion

Variables	Schadenfreude Experience	Social Dominance Orientation	Bullying	Social Comparison
Schadenfreude Experience	0.798	—	—	—
Social Dominance Orientation	0.327	0.751	—	—
Bullying	0.200	0.223	0.764	—
Social Comparison	0.397	0.135	0.052	0.840

The discriminant validity results shown in Table 7 indicate that the square roots of AVE values (diagonal elements) for each construct are greater than their correlations with other constructs. For example, the square root of AVE for schadenfreude experience (0.798) exceeds its correlations with social dominance orientation (0.327), bullying (0.200), and social comparison (0.397). Similarly, all other constructs meet this criterion, confirming that each construct is empirically distinct from the others. These findings support the adequacy of discriminant validity within the measurement model and indicate that the constructs are conceptually and statistically separable.

Table 8

Collinearity Statistics for Independent and Mediating Variables

Variable	VIF (Collinearity Index)	Status
Social Dominance Orientation	1.07	Acceptable
Bullying	1.06	Acceptable
Social Comparison	1.03	Acceptable

The results presented in Table 8 indicate that the variance inflation factor (VIF) values for all independent and mediating variables are well below the critical threshold (commonly 2.5 or 5), with values ranging from 1.03 to 1.07. These findings suggest that there is no significant multicollinearity among the predictor variables, confirming that each construct contributes uniquely to the model and that the estimation of path coefficients is not biased by collinearity issues.

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Table 9

Model Fit Indices

Fit Index	Value
Mean R Square	0.297
Q^2 (Predictive Relevance)	0.149
SRMR	0.070
NFI	0.909

As shown in Table 9, the model fit indices indicate an acceptable level of overall model adequacy. The mean R^2 value of 0.297 suggests that approximately 29.7% of the variance in the endogenous constructs is explained by the model, reflecting a moderate explanatory power. The Q^2 value of 0.149 indicates acceptable predictive relevance of the model. The SRMR value of 0.070 is below the recommended threshold of 0.08, demonstrating a good fit between the observed and predicted covariance matrices. Additionally, the NFI value of 0.909 exceeds the acceptable cutoff of 0.90, further confirming the adequacy of the model fit.

Table 10

Direct Path Coefficients in the Structural Model

Variables	Direct Effect	T-value	Significance
Social Dominance Orientation → Schadenfreude Experience	0.340	2.37	0.018
Bullying → Schadenfreude Experience	0.258	1.80	0.070
Bullying → Social Dominance Orientation	0.231	0.92	0.358
Social Comparison → Schadenfreude Experience	0.337	2.96	0.003
Social Comparison → Social Dominance Orientation	0.147	1.34	0.180

The results in Table 10 show that social dominance orientation has a significant positive direct effect on schadenfreude experience ($\beta = 0.340$, $t = 2.37$, $p = 0.018$). Similarly, social comparison significantly predicts schadenfreude experience ($\beta = 0.337$, $t = 2.96$, $p = 0.003$). In contrast, the direct effect of bullying on schadenfreude experience is not statistically significant at the conventional 0.05 level ($\beta = 0.258$, $t = 1.80$, $p = 0.070$), although it approaches marginal significance. Furthermore, bullying does not significantly predict social dominance orientation ($\beta = 0.231$, $t = 0.92$, $p = 0.358$), and social comparison also fails to significantly predict social dominance orientation ($\beta = 0.147$, $t = 1.34$, $p = 0.180$). Overall, these findings suggest that schadenfreude experience is directly influenced by social comparison and social dominance orientation, while the role of bullying is weaker and not statistically supported in the direct model.

Table 11

Indirect Path Coefficients in the Structural Model

Independent Variable	Mediator	Dependent Variable	Indirect Effect	T-value	Significance	VAF
Bullying	Social Dominance Orientation	Schadenfreude Experience	0.078	0.899	0.369	0.13
Social Comparison	Social Dominance Orientation	Schadenfreude Experience	0.050	1.17	0.240	0.24

As indicated in Table 11, the indirect effects of bullying and social comparison on schadenfreude experience through social dominance orientation are not statistically significant. Specifically, the indirect effect of bullying is 0.078 ($t = 0.899$, $p = 0.369$), while the indirect effect of social comparison is 0.050 ($t = 1.17$, $p = 0.240$). Additionally, the variance accounted for (VAF) values are 0.13 and 0.24, respectively, both below the threshold indicating meaningful mediation. These findings suggest that social dominance orientation does not play a significant mediating role in the relationships between the independent variables (bullying and social comparison) and schadenfreude experience, indicating that the effects are primarily direct rather than mediated.

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4. Discussion

The present study aimed to examine the structural relationships between social comparison and bullying with schadenfreude experience, considering the mediating role of social dominance orientation among medical residents. The findings revealed that social comparison and social dominance orientation had significant positive direct effects on schadenfreude, whereas the direct effect of bullying on schadenfreude was not statistically significant at the conventional threshold. In addition, neither bullying nor social comparison significantly predicted social dominance orientation, and the indirect effects through the mediating variable were not supported. Overall, the results suggest that schadenfreude in medical residents is primarily influenced by cognitive–evaluative processes such as social comparison and ideological orientations such as social dominance, rather than by direct exposure to bullying or mediated pathways.

The significant positive relationship between social comparison and schadenfreude aligns with the theoretical framework that positions social comparison as a central antecedent of counter-empathic emotions. Individuals who frequently engage in comparative evaluations of their abilities and outcomes relative to others are more likely to experience emotional reactions tied to perceived gains or losses in social standing. When upward comparison leads to perceived inferiority, the misfortune of the comparison target may serve as a psychological equalizer, eliciting schadenfreude. This finding is consistent with empirical evidence demonstrating that social comparison processes are closely linked to emotional responses to others' successes and failures, including both envy and schadenfreude (Boecker et al., 2022; Li et al., 2025). Furthermore, experimental and neuroscientific studies indicate that social comparison activates reward-related neural mechanisms when individuals observe the downfall of higher-status others, reinforcing the emotional experience of schadenfreude (Li et al., 2025). The present findings extend this line of research by demonstrating that such processes are also salient within professional contexts such as medical residency, where performance evaluation and peer comparison are pervasive.

The direct effect of social dominance orientation on schadenfreude further highlights the importance of ideological and personality-based factors in shaping emotional responses. Individuals with higher levels of social dominance orientation tend to endorse hierarchical social structures and group-based inequalities, which may predispose them to interpret others' misfortunes as reinforcing desirable social orders. In this framework, schadenfreude can be understood as an emotional manifestation of hierarchical thinking, where the suffering of others—particularly those perceived as competitors or lower-status individuals—is experienced as justified or even rewarding. This interpretation is strongly supported by prior research showing that individuals high in social dominance orientation exhibit reduced empathy and increased counter-empathic emotions, including schadenfreude (Hudson, 2022; Hudson et al., 2022). Additionally, studies have demonstrated that social dominance orientation is associated with support for harmful policies and intergroup hostility, mediated by emotional processes such as diminished empathy and increased pleasure in others' suffering (Hudson & Uenal, 2022). The present study contributes to this body of knowledge by confirming that these dynamics are also relevant in intra-professional settings, not only in intergroup or societal contexts.

In contrast, the non-significant direct effect of bullying on schadenfreude suggests that exposure to negative interpersonal behaviors alone may not be sufficient to generate counter-empathic emotional responses. While bullying has been consistently associated with negative psychological outcomes such as stress, anxiety, and burnout, its relationship with schadenfreude appears to be more complex and potentially contingent on additional cognitive or ideological factors. One possible explanation is that bullying experiences may evoke a range of emotional responses, including fear, anger, and distress, which may overshadow or inhibit the emergence of schadenfreude. Alternatively, individuals who are victims of bullying may be less likely to experience pleasure in others' misfortunes due to heightened sensitivity to suffering. Previous research on bullying and aggression supports this interpretation, indicating that the emotional consequences of bullying are multifaceted and context-dependent (Scott & Barlett, 2023; Widyastika & Anisah, 2023). Moreover, studies on bystander behavior suggest that reactions to bullying situations are influenced by motivational and situational factors, further complicating the relationship between bullying and emotional outcomes (Gotdiner & Gumpel, 2023).

The lack of significant relationships between bullying and social dominance orientation, as well as between social comparison and social dominance orientation, provides additional insight into the structural dynamics of the model. These findings suggest that social dominance orientation

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may function more as a stable dispositional or ideological variable rather than as a direct outcome of situational experiences such as bullying or comparison processes. This interpretation is consistent with research indicating that social dominance orientation is shaped by long-term socialization processes, including early life experiences, cultural influences, and personality traits, rather than by immediate contextual factors (Maor, 2024a; Tolomeo, 2025). Similarly, studies have shown that while social comparison and bullying can influence attitudes and behaviors, their effects on deep-seated ideological orientations are relatively limited (Chan & Poon, 2024; Chen et al., 2023). The present findings thus reinforce the conceptual distinction between situational and dispositional variables in explaining schadenfreude.

The non-significant indirect effects observed in the study further support the conclusion that social dominance orientation does not mediate the relationships between social comparison or bullying and schadenfreude. The low VAF values indicate that the proportion of variance explained through indirect pathways is minimal, suggesting that the effects of social comparison and social dominance orientation on schadenfreude operate largely independently. This finding challenges assumptions about the centrality of mediating mechanisms in such relationships and underscores the importance of examining direct effects in structural models. It is possible that other mediators, such as empathy, moral disengagement, or emotional regulation, may play a more significant role in linking these variables, as suggested by previous studies (Gan et al., 2024; Wakefield & Wakefield, 2023). Future research may benefit from incorporating these variables to provide a more comprehensive understanding of the underlying mechanisms.

The findings of this study also have important implications for understanding emotional dynamics in medical residency programs. The significant role of social comparison suggests that the competitive nature of medical training may contribute to the development of counter-empathic emotions, potentially affecting interpersonal relationships and professional behavior. At the same time, the influence of social dominance orientation highlights the role of individual differences in shaping responses to the same environment. Residents who strongly endorse hierarchical values may be more prone to experiencing schadenfreude, which could, in turn, influence their interactions with colleagues and patients. These dynamics are particularly relevant in light of research showing that hierarchical attitudes and reduced empathy can contribute to aggressive behaviors and interpersonal conflict in professional settings (Gordon, 2021; Gumpel & Gotdiner, 2022).

Moreover, the broader literature suggests that schadenfreude is not merely an isolated emotional response but is embedded within complex social and cultural processes. For example, media and digital environments have been shown to amplify social comparison and counter-empathic emotions, creating new contexts in which schadenfreude can emerge and be reinforced (Suter & Döveling, 2024; Wankmüller, 2025). Similarly, research on achievement motivation indicates that schadenfreude can influence competitive behavior and performance outcomes, particularly in environments characterized by evaluation and ranking (Simamora, 2021a, 2021b). These findings suggest that the implications of schadenfreude extend beyond individual emotional experiences to broader organizational and societal dynamics.

In addition, recent advances in the measurement and conceptualization of schadenfreude have provided new insights into its multidimensional nature. Studies have highlighted the importance of contextual factors, such as the type of misfortune and the relationship between the observer and the target, in shaping the intensity and expression of schadenfreude (Kato & Izumi, 2025; Szameitat et al., 2022). The present study contributes to this growing body of research by examining schadenfreude within a specific professional context and by integrating multiple explanatory variables within a structural model.

5. Conclusion

Taken together, the results of this study underscore the importance of considering both cognitive and ideological factors in understanding schadenfreude. While social comparison provides the evaluative framework through which individuals interpret others' outcomes, social dominance orientation shapes the emotional significance of these interpretations. The absence of significant effects for bullying and mediating pathways suggests that the experience of schadenfreude is not simply a reaction to negative interpersonal experiences but is influenced by deeper psychological processes. These findings contribute to the literature by providing a more nuanced understanding of the antecedents of schadenfreude and by highlighting the relevance of these processes in professional settings such as medical residency.

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The study is subject to several limitations. First, the cross-sectional design limits the ability to draw causal inferences about the relationships among variables. Second, the reliance on self-report measures may introduce response biases, including social desirability and common method variance. Third, the sample was drawn from a single hospital, which may limit the generalizability of the findings to other contexts or populations. Additionally, the relatively small sample size may have reduced the statistical power to detect weaker effects, particularly in the mediation analysis.

Future research should consider longitudinal designs to examine the temporal dynamics of social comparison, bullying, and schadenfreude, as well as their potential causal relationships. Expanding the sample to include multiple institutions and cultural contexts would enhance the generalizability of findings. Furthermore, incorporating additional variables such as empathy, moral disengagement, and emotional regulation could provide a more comprehensive understanding of the mechanisms underlying schadenfreude. The use of mixed-method approaches, including qualitative data, may also offer deeper insights into the subjective experiences of medical residents.

From a practical perspective, the findings highlight the need for interventions aimed at reducing excessive social comparison and promoting empathy within medical training environments. Educational programs that emphasize collaborative learning, emotional intelligence, and ethical professionalism may help mitigate the development of counter-empathic emotions such as schadenfreude. Organizational policies that address hierarchical dynamics and discourage bullying behaviors are also essential for fostering a supportive and inclusive work environment. Additionally, providing psychological support services for medical residents may help them cope with the stresses of training and develop healthier interpersonal relationships.

Authors' Contributions

Authors equally contributed to this article.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

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Declaration of Interest

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Ethical Considerations

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