

Empathy and social media addiction: the mediating role of emotional contagion among university students

Mohamed Ali Nemtallah¹, Reda Mahrous Ebrahim¹, Shima Abdelmoghny Elbeltagy²,
Sabry Mohamed Sharamant¹, Aya Fawzy Torky², Ashraf Ragab Ibrahim¹

¹Department of Educational Psychology and Statistics, Faculty of Education, Al-Azhar University, Takhna Al-Ashraf, Egypt

²Department of Mental Health, Faculty of Humanities, Al-Azhar University, Takhna Al-Ashraf, Egypt

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ABSTRACT

Social media addiction (SMA) has emerged as a significant behavioral health concern among university students, yet the mechanisms linking empathic sensitivity to compulsive platform use remain unclear. This study examined whether emotional contagion mediates the relationship between empathy and SMA among 1,471 Egyptian university students. Participants completed the affective and cognitive measure of empathy (ACME), susceptibility to emotional contagion scale, and SMA scale. Structural equation modeling revealed that empathy negatively predicted SMA directly ($\beta = -.527, p < .001$). However, empathy operated through opposing emotional contagion pathways: it increased susceptibility to positive emotional contagion (PEC) ($\beta = .564, p < .001$), which paradoxically elevated addiction risk ($\beta = .097, p < .001$), while simultaneously decreasing susceptibility to negative emotional contagion (NEC) ($\beta = -.322, p < .001$), which further protected against addiction ($\beta = .250, p < .001$). These opposing indirect effects canceled each other, yielding a non-significant total mediation effect. Results indicate that empathy's protective influence operates primarily through direct mechanisms rather than contagion-based transmission, with important implications for culturally tailored prevention strategies in collectivist educational contexts.

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Corresponding Author:

Mohamed Ali Nemtallah

Department of Educational Psychology and Statistics, Faculty of Education, Al-Azhar University

Takhna Al-Ashraf, Dakahlia, Egypt

Email: mohamednamatallah.2026@azhar.edu.eg

1. INTRODUCTION

Social media addiction (SMA) has emerged as a significant behavioral health concern among university students globally, affecting approximately 18-24% of this population, with regional variations reaching as high as 57% in some contexts [1]–[3]. What began as platforms designed for communication and connection has evolved into compulsive, reward-driven usage patterns characterized by salience, mood modification, tolerance, withdrawal, and relapse—core components of behavioral addiction [4], [5]. This transition is particularly pronounced in Egypt's densely digital student environments, where 100% of nursing students demonstrated some level of addiction [6], and 16.6% of medical students met clinical criteria for Facebook addiction [7]. The shift from tool to addiction reflects dopamine-mediated reinforcement mechanisms, with students increasingly using platforms not for social connection but to escape stress and regulate mood [8], [9].

The university period represents a critical developmental window for SMA, coinciding with emerging adulthood—a phase characterized by heightened needs for belonging, identity exploration, and

autonomy [10], [11]. Students with diffuse or still-forming interpersonal identities demonstrate greater susceptibility to compulsive platform use as they seek online validation and identity construction [12]. When belonging needs remain unmet in offline contexts, young adults compensate through intensified social media engagement, creating a cycle that elevates addiction risk and psychological maladjustment [13], [14]. This vulnerability is further amplified by the ongoing maturation of emotion-regulation and reward circuits, rendering students particularly susceptible to dopamine-driven compulsive behaviors [15], [16]. Consequently, platforms become central to developmental tasks rather than optional tools, facilitating maladaptive coping patterns linked to depression, anxiety, and academic impairment [17], [18].

Empathy in the digital age retains its multidimensional nature, encompassing both cognitive and affective components that operate through mediated channels [19], [20]. Cognitive empathy (COG) involves the controlled, intentional ability to recognize and take the perspective of another's emotional state, while affective empathy represents a more automatic sharing or mirroring of others' feelings [21], [22]. Despite the absence of physical cues in online interactions, users develop alternative channels for emotional attunement through symbolic representations such as emojis, graphics interchange formats (GIFs), and voice notes [23], [24]. Diary studies reveal that individuals still experience robust COG in computer-mediated communication, though affective resonance (RES) may be weaker when emotional signals are ambiguous [23], [25]. Through these nontraditional digital cues, meaningful emotional connection persists, allowing perspective-taking and emotional sharing to continue across technologically mediated platforms [26], [27].

Emotional contagion in virtual environments describes the process whereby users' emotions shift to resemble those expressed by others through technologically mediated cues such as text, images, and emojis [28], [29]. This phenomenon operates through platform algorithms that curate emotionally charged content, creating recursive feedback loops where emotional posts trigger similarly valenced comments and subsequent posts [30], [31]. Both positive and negative dimensions of emotional contagion manifest distinctly online: positive emotions spread through enthusiastic language and supportive interactions, while negative emotions—particularly anger and anxiety—often demonstrate greater persistence and contagion strength, especially during crises [32]–[34]. Psychological mechanisms including imitation, associative learning, and social comparison mediate this transmission, enabling purely text-based communication to alter emotional states and behavior [35], [36]. These repeated exposure-alignment-expression cycles ultimately stabilize into emotional climates that shape collective attitudes and reinforce engagement patterns [37], [38].

The collectivist nature of Egyptian culture profoundly shapes students' empathetic responses through social norms that emphasize shared emotion, communal obligations, and group harmony [39], [40]. Within this religiously grounded and community-oriented context, empathy functions not merely as an individual trait but as a socially reinforced mechanism for maintaining a sense of belonging and solidarity [41], [42]. Egyptian nursing students demonstrate elevated empathy scores closely tied to social support and cultural sensibility, with empathy mediating the relationship between emotional support and caring behaviors [42]. Horizontal collectivism—characterized by equality and shared responsibility—correlates with heightened cognitive and affective empathy, promoting emotion convergence through synchronized attention and collective practices [43], [44]. This cultural orientation toward interdependence and emotional alignment suggests that Egyptian students may experience intensified emotional contagion compared to individualistic contexts, as shared feelings become normative pathways for sustaining group identity [45], [46].

The interaction of person-affect-cognition-execution (I-PACE) model provides a comprehensive theoretical framework for understanding how emotional sensitivity contributes to addictive technology use through dynamic interactions among predisposing traits, affective responses, cognitive processes, and executive control [47], [48]. Emotionally sensitive individuals—characterized by neuroticism, loneliness, depression, and interpersonal sensitivity—experience heightened negative affect that makes online platforms particularly rewarding for mood regulation and social relief [49], [50]. This vulnerability operates through proximal mechanisms including fear of missing out, social comparison, and emotional dysregulation, which fuel maladaptive cognitions and weaken inhibitory control over compulsive use [51]–[53]. Complementary frameworks emphasize how emotional intelligence deficits and dysregulation increase reliance on digital platforms as coping strategies [54], [55]. Together, these models position emotional sensitivity as a critical predisposing factor channeling individuals toward repetitive, compulsive technology engagement [9], [56].

Despite established correlations between empathy and addiction, a critical research gap persists regarding the intermediate processes that actually transmit affect between individuals and influence addictive behaviors [29], [57]. Emotional contagion—the automatic, physiological “catching” of others' emotions through mimicry and affective alignment—represents a distinct, empirically tractable mechanism that precedes higher-order empathic processing [35], [58]. Evidence that digital addiction erodes emotional intelligence among Egyptian students underscores the relevance of this gap [59]. Examining emotional contagion as a mediator can illuminate how culturally shaped empathic responses translate into addictive patterns, providing grounded foundations for prevention strategies tailored to collectivist educational contexts [60], [61].

Building on the contributions, the present study addresses this research gap by empirically testing whether emotional contagion mediates the relationship between empathy and SMA among Egyptian university students. The present study makes three distinct novel contributions to the literature. First, it is among the first to empirically test emotional contagion as a mediating mechanism between empathy and SMA, moving beyond established correlational evidence to examine specific affective transmission pathways. Second, it disaggregates emotional contagion into positive and negative dimensions within a parallel mediation framework, allowing detection of opposing indirect effects that would otherwise remain obscured. Third, it situates these dynamics within an Egyptian collectivist context—a population underrepresented in SMA research—providing culturally grounded insights with translational relevance. Accordingly, this study addresses the following research questions:

- Does empathy directly predict SMA among Egyptian university students?
- Does empathy predict susceptibility to positive emotional contagion (PEC) and negative emotional contagion (NEC)?
- Do positive and NEC mediate the relationship between empathy and SMA?
- Do the indirect effects of empathy on SMA through positive versus negative contagion differ significantly from one another?

2. METHOD

2.1. Participants

The study comprised two samples of students from Al-Azhar University, Egypt, specifically from the Faculty of Education for Boys and the Faculty of Human Studies for Girls, both located in Tafahna Al-Ashraf. The psychometric validation sample consisted of 810 participants, while the main analytical sample included 1,471 participants. Detailed demographic characteristics of both samples are presented in Table 1. Participants in the psychometric sample ranged in age from 18 to 23 years ($M=19.24$, $SD=1.51$), while those in the main sample ranged from 18 to 23 years ($M=20.17$, $SD=1.55$). The distribution across gender, academic year, major, and residence is summarized in Table 1, which provides frequencies, percentages, and cumulative percentages for each demographic variable.

Table 1. Demographic characteristics of study participants

Variable	Category	Psychometric sample (N=810)			Main sample (N=1,471)		
		F	%	Cum. %	F	%	Cum. %
Gender	Male	400	49.4	49.4	961	65.3	65.3
	Female	410	50.6	100.0	510	34.7	100.0
Academic year	First year	477	58.9	58.9	371	25.2	25.2
	Second year	45	5.6	64.4	175	11.9	37.1
	Third year	130	16.0	80.5	327	22.2	59.3
	Fourth year	158	19.5	100.0	598	40.7	100.0
Major	Theoretical	545	67.3	67.3	932	63.4	63.4
	Practical	265	32.7	100.0	539	36.6	100.0
Residence	Rural	640	79.0	79.0	1148	78.0	78.0
	Urban	170	21.0	100.0	323	22.0	100.0

Note: F=frequency; %=percentage; Cum. %=cumulative percentage

2.2. Measures

Affective and cognitive measure of empathy (ACME) is a 36-item self-report instrument designed to assess both affective and cognitive dimensions of empathy [62]. The scale comprises three subscales: COG, which measures the ability to understand others' perspectives; RES, which assesses the capacity to share in others' emotions; and affective dissonance (DIS), which captures negative emotional responses to others' distress. Participants respond to each item using a 5-point Likert scale ranging from "strongly disagree" to "strongly agree". Confirmatory factor analysis (CFA) conducted on the psychometric sample demonstrated acceptable model fit: chi-square or $\chi^2(578)=1924.171$, $p<.001$; $\chi^2/\text{degrees of freedom ratio}$ (χ^2/df)=3.329; goodness of fit index (GFI)=.901; adjusted goodness of fit index (AGFI)=.856; comparative fit index (CFI)=.916; Tucker–Lewis index (TLI)=.909; root mean square error of approximation (RMSEA)=.054. Reliability coefficients for the subscales were robust, with COG yielding $\omega=.885$, $\alpha=.887$; RES yielding $\omega=.839$, $\alpha=.842$; and DIS yielding $\omega=.897$, $\alpha=.899$. Total scale reliability was excellent ($\omega=.915$, $\alpha=.921$).

Susceptibility to emotional contagion scale (SEC), is an 8-item measure designed to distinguish between susceptibility to PEC and susceptibility to NEC [63]. Items assessing PEC are scored such that

higher values indicate greater susceptibility (5=strongly agree), while items measuring NEC follow the same scoring direction. Participants respond using a 5-point Likert scale ranging from “strongly disagree” to “strongly agree”. The scale does not yield a total score; rather, the two dimensions are analyzed separately. CFA supported the two-factor structure: $\chi^2(19)=85.685$, $p<.001$, $\chi^2/df=4.509$, GFI=.970, AGFI=.943, CFI=.962, TLI=.943, RMSEA=.071. Reliability estimates for PEC were $\omega=.800$, $\alpha=.799$, and for NEC were $\omega=.773$, $\alpha=.771$.

SMA scale by Al-Menayes [64] is a 12-item instrument measuring behavioral, psychological, and social manifestations of SMA. The scale comprises three dimensions: i) social consequences (SC), which assesses negative impacts on relationships and social functioning; ii) time displacement (TD), which measures excessive time spent on social media at the expense of other activities; and iii) compulsive tendencies (CT), which evaluates loss of control over social media use. Participants rate their agreement with each item on a 5-point Likert scale from strongly disagree=1 to strongly agree=5. One reverse-coded item in the compulsive tendencies subscale (item 10) is recoded during scoring. CFA indicated adequate fit: $\chi^2(50)=240.834$, $p<.001$, $\chi^2/df=4.817$, GFI=.952, AGFI=.926, CFI=.931, TLI=.909, RMSEA=.069. Reliability coefficients were satisfactory: SC ($\omega=.700$, $\alpha=.702$), TD ($\omega=.730$, $\alpha=.733$), CT ($\omega=.609$, $\alpha=.736$), and total scale ($\omega=.842$, $\alpha=.842$).

2.3. Procedure

All instruments were translated from English to Arabic (the participants' native language) and back-translated by two independent expert translators to ensure linguistic equivalence. Data collection was conducted between 8 and 22 November 2025, via Google Forms distributed through official student group channels to different academic cohorts. Participation was voluntary and anonymous, with informed consent obtained electronically prior to accessing the survey. The study protocol adhered to ethical guidelines for research with human participants.

2.4. Data analysis

Data were analyzed using SPSS version 27 for descriptive statistics, correlation analyses, and reliability testing, and AMOS version 26 for confirmatory factor analyses and structural equation modeling. Mediation analyses were conducted to examine the indirect effects of empathy on SMA via emotional contagion pathways, with bootstrap procedures (5,000 samples) used to estimate bias-corrected confidence intervals (CI) for the indirect effects. To assess common method bias, Harman's single factor test was conducted via principal component analysis with unrotated factor extraction in SPSS, with results reported in the findings section.

3. RESULTS

Before testing the primary hypotheses, preliminary analyses were conducted to examine potential methodological artifacts. Harman's single-factor test was employed to assess common method variance bias, given that all variables were measured through self-report instruments. Principal component analysis with unrotated factor extraction revealed that the first factor accounted for 28.42% of the total variance, substantially below the conventional threshold of 50%, suggesting that common method bias did not pose a significant threat to the results' validity.

Pearson correlation coefficients were computed to examine the relationships among all study variables, with the complete correlation matrix presented in Table 2. All correlations were statistically significant at the $p<.01$ level. Empathy dimensions showed consistent negative correlations with all SMA facets, with total empathy demonstrating a strong negative relationship with total SMA ($r=-.553$). COG correlated negatively with social consequences ($r=-.442$), time displacement ($r=-.384$), and compulsive tendencies ($r=-.448$); similar patterns emerged for RES and DIS. PEC demonstrated moderate-to-strong positive associations with all three empathy dimensions: COG ($r=.464$), RES ($r=.575$), and DIS ($r=.408$), as well as with total empathy ($r=.564$). In contrast, NEC exhibited negative relationships with all empathy dimensions, ranging from $r=-.149$ for DIS to $r=-.374$ for COG, and with total empathy ($r=-.322$). Both emotional contagion dimensions showed positive associations with SMA: PEC correlated positively with total addiction ($r=.258$), while NEC showed stronger positive correlations with all addiction dimensions ($r=.338$ to $.382$) and with total addiction ($r=.397$).

A parallel multiple mediator model was specified to examine whether the relationship between empathy and SMA was mediated by emotional contagion dimensions. Total empathy served as the predictor variable (X), PEC and NEC functioned as parallel mediators (M1 and M2, respectively), and total SMA served as the outcome variable (Y). The analysis was conducted using PROCESS macro with 5,000 bootstrap samples. The conceptual model is illustrated in Figure 1.

Table 2. Pearson correlation coefficients among study variables

Variable	1	2	3	4	5	6	7	8	9	10
1. COG	1									
2. RES	.629**	1								
3. DIS	.406**	.684**	1							
4. ACME	.781**	.903**	.851**	1						
5. PEC	.464**	.575**	.408**	.564**	1					
6. NEC	-.374**	-.323**	-.149**	-.322**	-.232**	1				
7. SC	-.442**	-.483**	-.517**	-.572**	-.262**	.338**	1			
8. TD	-.384**	-.348**	-.323**	-.414**	-.187**	.362**	.740**	1		
9. CT	-.448**	-.433**	-.368**	-.489**	-.241**	.382**	.712**	.722**	1	
10. SMA	-.472**	-.473**	-.458**	-.553**	-.258**	.397**	.922**	.895**	.891**	1

Note: **p<.01 (2-tailed)

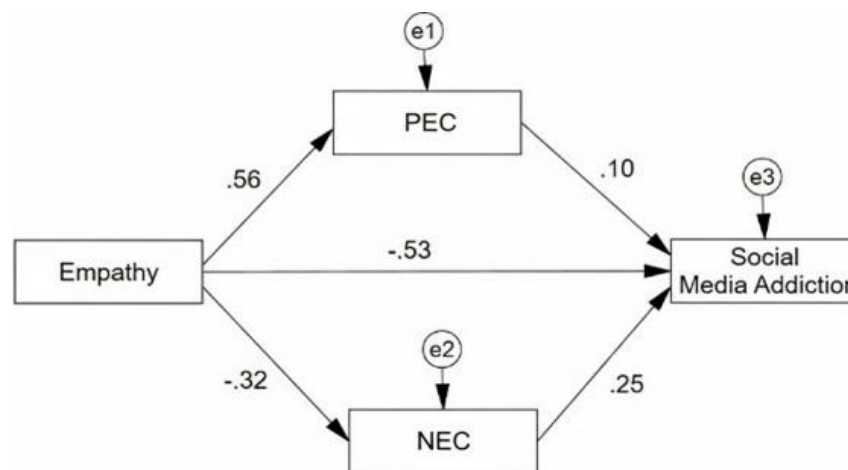


Figure 1. Parallel mediation model with standardized path coefficients

Empathy positively predicted PEC ($\beta=.564$, $p<.001$) but negatively predicted NEC ($\beta=-.322$, $p<.001$). Both mediators significantly predicted SMA: PEC ($\beta=.097$, $p<.001$) and NEC ($\beta=.250$, $p<.001$). The direct effect of empathy on SMA remained significant and negative ($\beta=-.527$, $p<.001$). The model demonstrated acceptable fit: $\chi^2(1)=4.860$, $p=.013$, $\chi^2/df=4.860$, GFI=.998, AGFI=.979, NFI=.996, CFI=.996, TLI=.978, RMSEA=.059. All path coefficients were statistically significant, as detailed in Table 3.

Table 3. Path coefficients for the parallel mediation model

Path	B	Standard error	t	p	95% CI		β
					LL	UL	
ACME→PEC	.074	.003	26.146	<.001	.068	.079	.564
ACME→NEC	-.060	.005	-13.039	<.001	-.070	-.051	-.322
PEC→SMA	.347	.091	3.827	<.001	.169	.525	.097
NEC→SMA	.625	.055	11.336	<.001	.517	.733	.250
ACME→SMA (direct)	-.248	.012	-20.326	<.001	-.271	-.224	-.527

Note: CI=confidence interval; LL=lower limit; UL=upper limit.

The total effect of empathy on SMA was significant ($B=-.260$, $p<.001$), with the direct effect representing 95.30% of the total effect. Decomposition of indirect effects, presented in Table 4, revealed contrasting mediation patterns. The indirect effect through PEC was positive and significant ($B=.026$, 95% CI [.011, .041]), accounting for -9.86% of the total effect, functioning as suppressor mediation. The indirect effect through NEC was negative and significant ($B=-.038$, 95% CI [-.048, -.028]), accounting for 14.56% of the total effect.

The total indirect effect was not statistically significant (95% CI: [-.030, .006]), indicating that, although each emotional contagion dimension independently mediated the empathy-addiction relationship, these effects operated in opposing directions and canceled each other out. The contrast between specific indirect effects was significant ($B=.063$, 95% CI [.046, .082]), confirming differential mediating roles.

Additionally, significant interactions emerged between empathy and both mediators: empathy×PEC, $F(1, 1466)=71.516$, $p<.001$, and empathy×NEC, $F(1, 1466)=172.143$, $p<.001$, suggesting conditional indirect effects. In summary, empathy exerted direct protective effects against SMA while simultaneously operating through opposing emotional contagion pathways. Higher empathy increased susceptibility to PEC (paradoxically elevating addiction) but decreased susceptibility to NEC (further protecting against addiction), resulting in a non-significant total mediation effect.

Table 4. Direct and indirect effects in the parallel mediation model

Effect type	B	β	Bootstrap standard error	95% CI		% of total (%)
				LL	UL	
Total effect	-.260	-.553	.010	-.280	-.240	100.00
Direct effect	-.248	-.527	.012	-.271	-.224	95.30
Total indirect	-.012	-.026	.009	-.030	.006	4.70
Via PEC	.026	.054	.008	.011	.041	-9.86
Via NEC	-.038	-.080	.005	-.048	-.028	14.56

Note: LL=lower limit; UL=upper limit.

4. DISCUSSION

The findings reveal a nuanced relationship between empathy and SMA mediated by opposing emotional contagion pathways. Higher empathy demonstrated strong protective effects against addiction ($\beta=-.527$), yet operated through contradictory mechanisms. Empathy enhanced susceptibility to PEC, which paradoxically increased addiction risk, while simultaneously reducing vulnerability to NEC, thereby strengthening protection. These opposing pathways statistically canceled each other, yielding a non-significant total indirect effect despite significant individual mediations. This pattern suggests empathy's protective influence operates primarily through direct mechanisms—such as enhanced perspective-taking and emotional regulation—rather than through contagion-based transmission. Examination of the correlation data suggests that both empathy dimensions contributed to this protective effect, though COG demonstrated comparatively stronger associations with SMA facets ($r=-.472$ with total SMA) relative to RES ($r=-.473$) and DIS ($r=-.458$), indicating that the capacity for deliberate perspective-taking and controlled mental state inference may be the primary driver of the direct protective effect, a distinction particularly relevant for educational researchers designing empathy-based interventions targeting compulsive platform use.

An important methodological implication emerges from the cancellation of opposing indirect effects observed in this study. Had the analysis relied solely on the total indirect effect, the conclusion would have been that emotional contagion plays no meaningful role in the empathy-SMA relationship—a conclusion that would be both statistically misleading and theoretically impoverished. The opposing significant specific indirect effects through PEC ($B=.026$, 95% CI [.011, .041]) and NEC ($B=-.038$, 95% CI [-0.048, -.028]) reveal that emotional contagion is in fact a critical and complex mechanism, operating through two distinct pathways with substantively different implications for addiction risk. This underscores the necessity of decomposing total indirect effects into specific indirect effects when parallel mediators are theoretically expected to operate in divergent directions, as aggregating them obscures the true complexity of the underlying affective processes and risks producing null findings that misrepresent the actual mediational dynamics.

These results align with theoretical frameworks positioning emotional sensitivity as central to technology addiction pathways. Consistent with the I-PACE model, empathy functions as a predisposing trait influencing affective responses and cognitions that shape platform engagement [47], [48]. The negative correlation between empathy and addiction ($r=-.553$) corroborates findings that emotional intelligence deficits increase reliance on digital platforms for mood regulation [54], [55]. However, the opposing mediational roles of emotional contagion dimensions extend prior research by illuminating specific transmission mechanisms. While previous studies have established that emotional contagion creates feedback loops that reinforce engagement [30], [31], the current findings demonstrate that positive and negative contagion operate through distinct pathways with differential effects on addiction risk, particularly within collectivist cultural contexts that emphasize shared emotion and communal obligations [39], [40].

These findings carry important implications for intervention design targeting SMA among university students in collectivist contexts. Prevention programs should cultivate empathetic capacities while simultaneously developing critical media literacy skills that disrupt automatic emotional contagion processes. Rather than discouraging positive emotional engagement, interventions might focus on conscious moderation strategies that preserve authentic connection while preventing compulsive patterns. The strong direct protective effect of empathy (95.30% of the total effect) suggests that empathy-building initiatives—including perspective-taking exercises, compassion training, and emotional awareness programs—could

effectively reduce the risk of addiction. For Egyptian students navigating collectivist norms that amplify emotional convergence, culturally adapted interventions acknowledging communal values while promoting autonomy over platform use may prove particularly effective. Educational institutions should integrate emotional intelligence curricula alongside digital wellness frameworks that recognize the complex interplay between prosocial traits and technology engagement.

Several limitations warrant consideration when interpreting these results. The cross-sectional design precludes causal inferences, leaving temporal directionality among empathy, emotional contagion, and addiction uncertain. Longitudinal research tracking developmental trajectories would clarify whether empathy erosion follows addiction onset or vice versa. Reliance on self-report measures introduces potential response biases, though Harman's test suggested common method variance remained minimal. The sample comprised exclusively Egyptian university students from a single institution with religious foundations, limiting generalizability to secular contexts, other age groups, or individualistic cultures. Platform-specific usage patterns were not differentiated, yet contagion dynamics may vary substantially across TikTok, Instagram, Twitter, and Facebook. Finally, the study did not assess actual emotional contagion events or behavioral engagement metrics, relying instead on self-reported susceptibility. Incorporating behavioral data and ecological momentary assessment would strengthen construct validity and ecological generalizability.

Future research should employ longitudinal and experimental designs to establish causal pathways linking the development of empathy, exposure to emotional contagion, and addiction trajectories. Investigating platform-specific mechanisms would illuminate how algorithmic curation differentially amplifies positive versus negative contagion across diverse social media environments. Cross-cultural comparative studies contrasting collectivist and individualistic societies could identify cultural moderators shaping emotional transmission patterns. Neuroimaging research examining neural correlates of empathy and contagion during social media use would elucidate underlying biological mechanisms. Additionally, intervention trials testing empathy-enhancement programs alongside contagion-disruption strategies could validate translational applications. Examining protective factors such as mindfulness, emotional granularity, and metacognitive awareness may reveal resilience mechanisms buffering against maladaptive contagion. Finally, exploring gender differences and developmental variations across emerging adulthood would refine understanding of vulnerability windows requiring targeted prevention efforts.

5. CONCLUSION

This study demonstrates that empathy exerts robust protective effects against SMA among Egyptian university students, primarily through direct pathways rather than emotional contagion. While empathetic individuals show increased susceptibility to PEC—potentially elevating engagement—they simultaneously demonstrate resistance to negative contagion, which provides additional protection. The cancellation of these opposing indirect effects underscores the complexity of affective processes in digital environments, particularly within collectivist cultural contexts that emphasize shared emotion. These findings advance theoretical understanding by integrating I-PACE frameworks with cultural-emotional dynamics, revealing that prosocial traits interact with platform-mediated contagion in multifaceted ways. Practically, results support empathy-building interventions as viable addiction prevention strategies, while highlighting the need for nuanced approaches that address both positive and negative dimensions of emotional transmission in technologically mediated spaces.

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AUTHOR CONTRIBUTIONS STATEMENT

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Name of Author	C	M	So	Va	Fo	I	R	D	O	E	Vi	Su	P	Fu
Mohamed Ali Nemtallah	✓		✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓
Reda Mahrous Ebrahim	✓	✓	✓		✓	✓		✓		✓		✓	✓	✓
Shimaa Abdelmoghny Elbeltagy	✓	✓		✓		✓		✓		✓	✓	✓		✓
Sabry Mohamed Sharamant	✓	✓	✓			✓	✓	✓	✓	✓		✓		✓
Aya Fawzy Torky	✓	✓		✓		✓		✓		✓	✓	✓		✓
Ashraf Ragab Ibrahim	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓

C : Conceptualization

M : Methodology

So : Software

Va : Validation

Fo : Formal analysis

I : Investigation

R : Resources

D : Data Curation

O : Writing - Original Draft

E : Writing - Review & Editing

Vi : Visualization

Su : Supervision

P : Project administration

Fu : Funding acquisition

CONFLICT OF INTEREST STATEMENT

Authors state no conflict of interest.

INFORMED CONSENT

Informed consent was obtained from all participants after explaining the study's purpose, procedures, risks, and benefits, in accordance with ethical guidelines and institutional approval.

ETHICAL APPROVAL

The study protocol was approved by the Research Ethics Committee of the Faculty of Education, Al-Azhar University, Egypt (Ref. No. EDU-REC-2025-0269).

DATA AVAILABILITY

The data are available from the corresponding author, [MAN], upon reasonable request.

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BIOGRAPHIES OF AUTHORS



Mohamed Ali Nemtallah    is a lecturer at Department of Educational Psychology and Statistics, Faculty of Education, Al-Azhar University, Egypt. His expertise centers on the intersection of psychology and education, emphasizing the application of statistical methods in educational research and practice. His professional responsibilities encompass teaching, research, and student academic development in educational psychology and statistics. He contributes to advancing quantitative methodologies in educational research, helping bridge theoretical psychological concepts with practical educational applications through rigorous statistical analysis and interpretation. He can be contacted at email: mohamednamatallah.2026@azhar.edu.eg.



Reda Mahrous Ebrahim    is an assistant professor in the Department Educational Psychology and Statistics, Faculty of Education, Al-Azhar University, Egypt. His expertise centers on educational measurement and evaluation, as well as psychological and educational data analysis in modern learning environments. His research focuses on developing and constructing modern psychometric tools in accordance with scientific standards and on evaluating the effectiveness of educational programs and pedagogical interventions, particularly in special education and learning disabilities. Dr. Ebrahim contributes to advancing data-driven educational decision-making and enhancing the quality of educational practices within educational institutions through his scholarly work. He can be contacted at email: redamahrous.26@azhar.edu.eg.



Shima Abdelmoghny Elbeltagy    is a lecturer in Department of Mental Health, Faculty of Humanities, Al-Azhar University, Egypt. She works in mental health promotion, and her research focuses on various psychological phenomena in light of contemporary societal developments. Through her scholarly work, Dr. Elbeltagy seeks to increase individual and societal awareness of the importance of mental health and its vital role in improving quality of life for individuals, thereby achieving societal well-being. She can be contacted at email: shimaaelbeltagy.8@azhar.edu.eg.



Sabry Mohamed Sharamant    is a lecturer in the Department Educational Psychology and Statistics, Faculty of Education for Boys, Al-Azhar University, Egypt. His research focuses on psycholinguistics and cognitive psychology, examining the relationship between language and thinking, as well as the psychological and cognitive factors that influence language learning. His research addresses topics such as reading self-concept, language anxiety, metacognitive strategies, and foreign-language learning strategies, aiming to understand how these factors contribute to the development of linguistic competence and to the improvement of the language-learning process. He can be contacted at email: sabrybasiony.26@azhar.edu.eg



Aya Fawzy Torky    is a lecturer in Department of Mental Health, Faculty of Humanities, Al-Azhar University, Egypt. She works in the field of mental health development, and her research focuses on enhancing the quality of psychological life, raising societal awareness, and empowering individuals to achieve sustainable psychological balance. Through her scholarly work, Dr. Torky focuses on positive health and on strengthening individuals' psychological capacities to face challenges and adapt to modern developments. She can be contacted at email: ayafawzy.2071@azhar.edu.eg.



Ashraf Ragab Ibrahim    is a lecturer at Department of Educational Psychology and Statistics, Faculty of Education, Al-Azhar University, Egypt. He earned his Ph.D. in Educational Psychology with specialization in Measurement and Evaluation. His research portfolio encompasses psychometrics, scale development, and investigating the psychological impacts of educational technologies, including artificial intelligence applications in educational environments. Ibrahim's scholarly work examines academic and psychological variables within educational contexts, contributing valuable insights to educational assessment and evaluation methodologies. He can be contacted at email: Ashraflbrahim.26@azhar.edu.eg.