

A Moderated Mediation Model of Online Peer Validation, Contingent Self-Worth, Social Comparison, and Adolescent Anxiety

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ABSTRACT

Objective: This study aimed to test whether contingent self-worth mediates the association between online peer validation and adolescent anxiety and whether social comparison moderates the relationship between contingent self-worth and anxiety.

Methods and Materials: A quantitative cross-sectional correlational study was conducted with 428 adolescents aged 13–18 years enrolled in seven public secondary schools in Ontario and British Columbia, Canada. Participants completed measures of online peer validation, contingent self-worth, social comparison orientation, and anxiety, together with a demographic questionnaire. Online peer validation was assessed using an eight-item scale developed for the study, contingent self-worth was measured using externally oriented dimensions of the Contingencies of Self-Worth Scale, social comparison was assessed using the Iowa-Netherlands Comparison Orientation Measure, and anxiety was measured using the Generalized Anxiety Disorder-7 questionnaire. Data were analyzed using Pearson correlations, multiple regression, and second-stage moderated mediation analysis with 5,000 bootstrap resamples. Age, gender, and average daily social-media use were examined as covariates.

Findings: Online peer validation significantly predicted contingent self-worth, $B = 0.72$, $SE = 0.06$, $\beta = .48$, $p < .001$. In the anxiety model, online peer validation remained significant, $B = 0.10$, $SE = 0.04$, $\beta = .13$, $p = .006$, while contingent self-worth, $B = 0.19$, $SE = 0.02$, $\beta = .36$, $p < .001$, and social comparison, $B = 0.17$, $SE = 0.03$, $\beta = .27$, $p < .001$, were also significant predictors. The contingent self-worth $\times$ social comparison interaction was significant, $B = 0.012$, $SE = 0.003$, $\beta = .15$, $p < .001$. Conditional indirect effects increased from 0.07 at low social comparison to 0.14 at the mean and 0.20 at high social comparison. The index of moderated mediation was 0.009, 95% bootstrap CI [0.004, 0.015].

Conclusion: Online peer validation was associated with greater adolescent anxiety partly through contingent self-worth, and this indirect relationship was substantially stronger among adolescents with higher social comparison orientation, highlighting the importance of externally based self-evaluation and comparison processes in understanding digital-context anxiety.

Keywords: online peer validation; contingent self-worth; social comparison; adolescent anxiety; moderated mediation; social media

1. Introduction

Adolescence is a developmental period characterized by substantial changes in identity formation, interpersonal sensitivity, emotional regulation, autonomy, and the social meaning assigned to peer relationships. During this period, peer evaluation becomes particularly salient because adolescents increasingly use social feedback as a source of information about belonging, competence, attractiveness, popularity, and personal worth. At the same time, adolescence is also a period of heightened vulnerability to internalizing difficulties, including anxiety, worry, fear of negative evaluation, and social threat sensitivity. Recent evidence has emphasized that adolescent anxiety should be understood not only in terms of stable individual predispositions but also in relation to rapidly changing social environments in which peer feedback is continuously available and psychologically consequential. Studies conducted during and following the COVID-19 pandemic documented sustained elevations in anxiety and depressive symptoms among adolescents, reinforcing concerns regarding the interaction between developmental vulnerability and changing social conditions (Barbieri et al., 2022; Cochran et al., 2023; Skinner et al., 2023). Daily-life research has similarly shown that adolescents' emotional health is sensitive to shifts in social contact, family support, and interpersonal stressors, particularly when normal patterns of peer interaction are disrupted (Çetin & Ata, 2022; Silk et al., 2021). In Canada, unmet needs for adolescent mental health support have also highlighted the importance of identifying psychosocial processes that may contribute to distress before symptoms become sufficiently severe to require intensive intervention (Gorfinkel et al., 2023). These developments have increased scholarly attention to the role of digital environments, particularly social-media platforms, in shaping adolescents' emotional experiences, because contemporary peer relationships are no longer confined to face-to-face settings but are continuously extended through online networks in which social approval, exclusion, comparison, and evaluation are publicly or semi-publicly quantified.

Social media may offer adolescents important opportunities for communication, identity exploration, companionship, information sharing, and social support, but the same platforms can expose users to persistent evaluative pressures. Systematic reviews indicate that the association between online social connections and adolescent mental health is complex rather than uniformly beneficial or

harmful, with outcomes depending on the quality of online relationships, the type of engagement, existing vulnerabilities, and the psychological meaning adolescents assign to digital interactions (Kostyrka-Allchorne et al., 2022; Prochnow et al., 2025). Exposure to social media has been associated with a range of psychiatric and psychological outcomes in youth, particularly when use becomes excessive, socially threatening, compulsive, or strongly focused on external evaluation (Marano et al., 2025; Purificacion & Vallespin, 2024). Digital environments may also generate forms of stress that differ from conventional offline stress because social feedback can be immediate, persistent, quantifiable, and visible to broad peer audiences. Emerging measures of digital stress in children and adolescents have therefore attempted to distinguish dimensions such as social overload, availability pressure, fear of exclusion, evaluative monitoring, and difficulties disengaging from digital communication (Geckalan, 2026; Nagel & Kruse, 2026). The relevance of these pressures is further supported by evidence that the particular characteristics of social-media activities matter for adolescent mental health; content-focused, comparison-oriented, feedback-seeking, and socially evaluative activities may have different psychological implications than purely communicative or informational use (Yang et al., 2025). Research on social-media experiences among secondary-school students has similarly shown that online interactions can influence peer-related attitudes and fear of missing out, reinforcing the broader proposition that digital environments transform the ways in which adolescents monitor peer norms and evaluate their own social standing (Ngo et al., 2024).

Within this context, online peer validation represents a particularly important mechanism. Online peer validation refers to the degree to which adolescents interpret likes, comments, reactions, shares, views, follower responses, and other forms of digital feedback as evidence of interpersonal acceptance and personal value. Unlike traditional peer approval, which may be communicated ambiguously or privately, social-media validation is often measurable and continuously accessible. These characteristics may encourage adolescents to monitor the quantity and quality of peer responses, compare expected and received feedback, and use digital reactions as indicators of whether they are socially valued. Such processes are likely to be especially influential during adolescence because concerns about peer acceptance and rejection are developmentally salient. Experimental and naturalistic research on peer-related threat has demonstrated that adolescents' anxiety may increase in

contexts characterized by social evaluation, victimization, or perceived negative peer judgment (Niu et al., 2023; Schacter et al., 2025). Peer victimization has also been associated with internalizing symptoms both within and between individuals, suggesting that recurring adverse peer experiences may accumulate into broader emotional vulnerability (Schacter, 2022). More recent work using moderated mediation frameworks has similarly indicated that the psychological impact of peer victimization depends on intervening and moderating processes rather than reflecting a simple direct relationship (Hui et al., 2026). Cyberbullying research further demonstrates that negative digital peer experiences are closely associated with social anxiety and other maladaptive school-related outcomes (Cañas et al., 2026), while systematic evidence confirms a broader relationship between cyberbullying exposure and compromised adolescent mental health (Mohedo et al., 2026). These findings collectively suggest that the psychological meaning adolescents attach to digital peer reactions may be at least as consequential as the amount of time they spend online.

One mechanism through which online peer validation may influence anxiety is contingent self-worth. Contingent self-worth describes a form of self-evaluation in which feelings of personal value depend on meeting particular standards or receiving validation within specific domains. When self-worth is contingent on external approval, an individual's emotional stability becomes more dependent on favorable social evaluation and more vulnerable to rejection, criticism, comparison, or ambiguous feedback. This mechanism is particularly relevant to social-media environments because such environments frequently transform peer evaluation into visible metrics. Adolescents whose sense of worth depends heavily on peer responses may therefore experience favorable digital feedback as temporarily reassuring while interpreting limited or negative feedback as evidence of personal inadequacy. Research outside the specific context of social media has shown that contingent self-esteem can mediate relationships between interpersonal or family factors and anxiety, demonstrating that the conditional basis of self-worth may be an important explanatory mechanism in emotional distress (Németh & Bernáth, 2022). This logic is also consistent with evidence that adolescent well-being may be affected by perceived pressure to perform socially valued identities, including gendered or appearance-related expectations (Hensler & Emmott, 2025). Appearance-related social-media use is especially relevant because visual platforms encourage

adolescents to evaluate appearance through peer feedback and comparison, and longitudinal evidence has linked appearance-focused social-media engagement with body dissatisfaction and competitive anxiety (Zhang et al., 2026). Thus, online validation may contribute to anxiety not simply because adolescents receive positive or negative feedback but because repeated exposure to evaluative signals may encourage them to locate personal worth in reactions that are inherently unstable and externally controlled.

The effects of contingent self-worth are unlikely to be uniform across adolescents, and social comparison may represent an important condition that intensifies its psychological consequences. Social comparison refers to the tendency to evaluate one's attributes, achievements, appearance, social standing, or experiences relative to those of other people. Although comparison is a normative part of social development, digital platforms substantially increase the frequency, accessibility, and scope of comparison opportunities by presenting adolescents with curated representations of peers' lives, appearance, achievements, relationships, and popularity. Adolescents with stronger social comparison orientations may therefore be especially sensitive to discrepancies between their own perceived social value and the visible indicators of success or approval obtained by others. In such circumstances, contingent self-worth may become particularly unstable because personal evaluation is not based solely on whether approval is received but on whether that approval appears sufficient relative to the approval received by peers. Research examining youth digital experiences suggests that the emotional consequences of social-media use are strongly dependent on contextual and person-specific characteristics rather than exposure alone (Kostyrka-Allechorne et al., 2022; Yang et al., 2025). Related work on peer influence and fear of missing out has shown that adolescents' online experiences can amplify sensitivity to what peers are doing and how they are being evaluated (Ngo et al., 2024). The importance of reference points is also evident in research showing that adolescents' interpersonal expectations can vary according to the specific target or referent being evaluated, underscoring the broader principle that social judgments are relational and context dependent (Mo et al., 2024). Accordingly, the relationship between contingent self-worth and anxiety may be substantially stronger among adolescents who chronically compare themselves with peers than among adolescents who are less comparison oriented.

The proposed relationship is also consistent with broader evidence concerning adolescent social threat sensitivity and

online help-seeking. Adolescents who perceive peer contexts as threatening may respond more strongly to daily experiences of victimization or evaluation, with social threat sensitivity magnifying anxious affect (Schacter et al., 2025). Fear of negative evaluation has similarly emerged as a specific outcome associated with peer-related performance monitoring, suggesting that adolescents do not respond uniformly to evaluative social settings (Niu et al., 2023). For adolescents whose self-worth is contingent upon external approval, high social comparison may create a self-reinforcing process in which online feedback is repeatedly interpreted in relation to peers, thereby increasing vigilance toward indicators of relative acceptance or inadequacy. Such vigilance may produce anxiety even when overt rejection is absent, because uncertainty about one's comparative standing may itself become distressing. Online support-seeking may not always protect against these processes. Research among adolescent girls has shown that digital support seeking can coexist with co-rumination and poorer mental health, illustrating how interpersonal engagement may provide both connection and repeated opportunities to rehearse distress (Mackenzie et al., 2023). Conversely, adolescents also express preferences for digital mental health interventions that are responsive to their developmental needs, suggesting that online environments can be used constructively when their design supports autonomy, safety, and meaningful assistance rather than evaluative pressure (Kornfield et al., 2024). Interventions aimed at adolescents with social communication difficulties likewise demonstrate the value of structured, supported approaches to social interaction, including blended formats that combine online and interpersonal elements (Wolstencroft et al., 2021). These findings reinforce the need to distinguish between digital connection as a resource and digital evaluation as a potential psychological stressor.

A further reason to examine these relationships within an integrated conditional process model is that adolescent anxiety is a heterogeneous outcome that can arise through multiple pathways. Measurement research has emphasized the need to distinguish general anxiety from domain-specific forms, such as reading anxiety or fear of negative evaluation, because adolescents may experience distress in ways that are strongly tied to specific contexts (Jones et al., 2025; Niu et al., 2023). Ecological momentary assessment approaches also increasingly recognize that adolescent emotional experiences fluctuate across daily contexts and interpersonal situations, making it important to study mechanisms that can operate repeatedly in everyday life (Murray et al., 2023).

Digital settings are particularly relevant to such models because they extend peer evaluation across time and place, creating repeated opportunities for validation seeking, self-evaluation, comparison, and anxious interpretation. At the same time, advances in digital modeling and survey-anchored computational approaches underscore both the potential and limitations of representing adolescent psychological processes through simplified models, emphasizing the importance of grounding theoretical models in empirically observed associations rather than assuming that digital behavior directly reflects underlying psychological states (Wang et al., 2026). Related psychometric work in other adolescent and youth populations also illustrates the broader importance of establishing valid normative and measurement frameworks before interpreting individual differences in psychosocial constructs (Philip et al., 2024). Consequently, examining online peer validation, contingent self-worth, social comparison, and anxiety within a single moderated mediation framework may offer a more precise account of how digital social experiences become psychologically consequential.

The importance of identifying such mechanisms is heightened by evidence that adolescents experiencing psychological distress often display multiple overlapping vulnerabilities rather than isolated symptoms. Studies of resilience and trauma-related symptoms demonstrate that emotional risk is shaped by interacting personal and contextual factors, supporting analytic models that move beyond single predictors (Agyapong et al., 2026). Assessment-informed approaches to other adolescent risk behaviors similarly emphasize the value of identifying psychological mechanisms and individual differences that can distinguish adolescents at greater risk from those who encounter similar environments without developing comparable difficulties (Amos et al., 2025). In the context of online peer experiences, this perspective suggests that high exposure to digital interaction is not sufficient to explain anxiety; rather, the meaning assigned to peer reactions, the extent to which self-worth depends on such reactions, and the tendency to compare oneself with others may collectively determine vulnerability. This distinction is theoretically important because it shifts attention from broad claims that social media is either beneficial or harmful toward a more differentiated account of who may be affected, through which psychological process, and under what conditions. It is also clinically and educationally relevant because interventions focused solely on reducing

screen time may overlook the evaluative beliefs and comparison tendencies that make some forms of digital engagement distressing.

Despite the growing literature on adolescent digital experiences, peer victimization, digital stress, social comparison, and internalizing symptoms, important conceptual gaps remain. Existing studies frequently examine social-media exposure, cyberbullying, peer victimization, anxiety, or digital stress as separate associations, while fewer studies integrate validation seeking and self-worth contingencies within a conditional process framework. Reviews of adolescent online experiences have repeatedly emphasized heterogeneity in effects and the need to identify specific mechanisms connecting digital interaction with mental health outcomes (Marano et al., 2025; Prochnow et al., 2025). Similarly, digital stress research has highlighted the multidimensional nature of online pressures (Geckalan, 2026; Nagel & Kruse, 2026), while studies of adolescent peer dynamics show that socially evaluative experiences may affect anxiety differently depending on individual sensitivity and relational context (Hui et al., 2026; Schacter et al., 2025). The present conceptual model addresses these gaps by distinguishing four theoretically related but non-equivalent constructs: online peer validation as the initiating digital-social process, contingent self-worth as the psychological mechanism through which external approval becomes incorporated into self-evaluation, social comparison as a moderator that may intensify the emotional consequences of externally contingent self-worth, and anxiety as the resulting internalizing outcome. This structure permits simultaneous examination of direct, indirect, and conditional effects and provides a theoretically coherent explanation for why adolescents who appear to engage in similar digital environments may experience markedly different emotional outcomes.

Accordingly, the aim of the present study was to test a moderated mediation model in Canadian adolescents in which online peer validation predicts anxiety indirectly through contingent self-worth, while social comparison moderates the association between contingent self-worth and adolescent anxiety.

2. Methods and Materials

2.1. Study Design and Participants

This study employed a quantitative, cross-sectional, correlational design to examine the relationships among online peer validation, contingent self-worth, social

comparison, and anxiety in adolescents and to test a moderated mediation model explaining the psychological process through which reliance on online peer validation may be associated with heightened anxiety. The study population consisted of adolescents enrolled in public secondary schools in Canada. A total of 428 adolescents aged 13 to 18 years participated in the study. The participants were recruited from seven public secondary schools located in Ontario and British Columbia using a multistage cluster sampling procedure. At the first stage, participating schools were selected from cooperating school districts; at the second stage, classes were selected from different grade levels; and at the final stage, eligible students in the selected classes were invited to participate. The final sample included 218 girls (50.93%), 198 boys (46.26%), and 12 adolescents (2.80%) who identified as non-binary, another gender identity, or preferred not to specify their gender. Participants had a mean age of 15.46 years ($SD = 1.43$). Eligibility criteria included being between 13 and 18 years of age, being currently enrolled in a participating Canadian secondary school, having used at least one social networking platform during the previous six months, being sufficiently proficient in English to understand the questionnaire items, and providing informed assent together with parental or guardian consent when required for participants younger than 18 years. Adolescents were excluded when they submitted substantially incomplete questionnaires, provided patterned or evidently inattentive responses, or were unable to complete the survey independently. Data collection was conducted through a secure online questionnaire administered during a designated school period under standardized conditions. Students were informed that participation was voluntary, that they could discontinue participation at any point without academic or personal consequences, and that their responses would remain anonymous and confidential. No names, usernames, account identifiers, or other personally identifying social-media information were collected. Before participation, the purpose and procedures of the research were explained in developmentally appropriate language, and informed assent and required parental or guardian consent were obtained. The research procedures were designed in accordance with accepted ethical principles for research involving minors, with particular attention to confidentiality, voluntary participation, psychological welfare, and protection of adolescents' digital privacy.

2.2. Measures

Data were collected using a demographic information form and four self-report instruments measuring online peer validation, contingent self-worth, social comparison orientation, and anxiety. Online peer validation was assessed using an eight-item Online Peer Validation Scale developed for the present study to measure the extent to which adolescents rely on digitally communicated peer reactions as indicators of acceptance, popularity, and personal value. Item development was guided by the conceptual definition of online peer validation as psychological dependence on interpersonal feedback received through social networking environments, including likes, reactions, comments, views, shares, and other visible indicators of peer approval. The items assessed behaviors and emotional responses such as frequently checking reactions to posted content, feeling more positively about oneself after receiving favorable peer responses, experiencing disappointment when a post receives less attention than expected, attaching importance to the number of likes or comments obtained, and perceiving positive online reactions as evidence of peer acceptance. Responses were recorded on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), with higher total scores representing a stronger tendency to seek and psychologically depend on online peer validation. Prior to the main study, the initial item pool was evaluated by specialists in developmental psychology, adolescent mental health, psychometrics, and digital-media research to assess content relevance, clarity, developmental appropriateness, and construct coverage. The revised scale was subsequently pilot-tested with adolescents who were not included in the main sample, and item wording was refined on the basis of comprehension and preliminary psychometric analyses. In the main study, the factor structure and internal consistency of the measure were examined before inclusion of the composite score in the conditional process analysis.

Contingent self-worth was assessed using the Contingencies of Self-Worth Scale developed by Crocker and colleagues. The instrument conceptualizes self-worth as varying according to the domains upon which individuals base their sense of personal value and therefore permits assessment of the degree to which positive self-evaluation depends on meeting external or internal standards. The original instrument contains 35 items representing seven domains of contingent self-worth: approval from others, appearance, competition, academic competence, family support, virtue, and God's love. Because the conceptual

model of the present study concerned adolescents' vulnerability to peer-based external evaluation, particular emphasis was placed on externally contingent dimensions, especially approval from others and appearance-related self-worth, while the complete scale was administered to preserve the established multidimensional structure of the measure. Participants indicated the extent to which each statement described them using a seven-point response format ranging from 1 (strongly disagree) to 7 (strongly agree). Items were scored according to the original scoring procedure, including reverse scoring where appropriate, and higher scores indicated greater dependence of self-esteem on particular sources of validation. For the moderated mediation analysis, a composite indicator reflecting externally contingent self-worth was calculated from the theoretically relevant approval- and appearance-related domains, with higher scores representing stronger dependence of personal worth on favorable evaluation by others. Internal consistency was examined in the present sample using both Cronbach's alpha and McDonald's omega before construction of the composite score.

Social comparison orientation was measured using the Iowa-Netherlands Comparison Orientation Measure developed by Gibbons and Buunk. The scale assesses individual differences in the tendency to compare one's opinions, abilities, circumstances, and personal characteristics with those of other people. This construct was selected as the moderator because adolescents who chronically evaluate themselves relative to others may be particularly susceptible to anxiety when their self-worth depends on external approval. The measure consists of 11 items addressing comparison of abilities and opinions with those of other individuals. Participants responded using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Negatively phrased items were reverse scored before calculation of the total score, and higher scores represented a stronger general orientation toward social comparison. In the present study, the measure was framed with standard instructions emphasizing participants' typical comparison tendencies rather than comparison within any single social-media platform, thereby capturing a relatively general psychological disposition capable of shaping adolescents' responses to contingent self-worth. The internal consistency of the scale was evaluated in the Canadian adolescent sample before its score was entered into the interaction term of the moderated mediation model.

Adolescent anxiety was assessed using the Generalized Anxiety Disorder-7 questionnaire developed by Spitzer and

colleagues. The GAD-7 is a seven-item self-report measure designed to assess the frequency of core anxiety symptoms, including excessive nervousness or worry, difficulty controlling worry, restlessness, irritability, difficulty relaxing, and apprehensive expectations. Participants were asked to indicate how often they had experienced each symptom during the preceding two weeks using a four-point response scale ranging from 0 (not at all) to 3 (nearly every day). Item scores were summed to produce a total score ranging from 0 to 21, with higher scores indicating greater severity of anxiety symptoms. In the present study, the total score was treated as a continuous outcome variable rather than being used primarily for diagnostic classification because the objective was to examine individual differences in anxiety across the full adolescent sample. The questionnaire was administered as a measure of symptom severity and was not interpreted as establishing a clinical diagnosis. A brief demographic questionnaire was additionally used to obtain information on age, gender, school grade, province, average daily time spent on social media, number of frequently used social-media platforms, and the platform used most often. Average daily social-media use and age were retained as potential covariates because differences in developmental stage and intensity of online activity could plausibly covary with the principal constructs investigated in the study.

2.3. Data Analysis

Data analysis was conducted using IBM SPSS Statistics, supplemented by Andrew F. Hayes's PROCESS macro for conditional process analysis. Before testing the primary hypotheses, the dataset was screened for completeness, data-entry errors, response patterns, univariate outliers, and multivariate outliers. Cases with substantial missing data or evidence of inattentive responding were excluded before calculation of scale scores. For the remaining observations, the amount and pattern of missing data were examined and appropriate treatment was applied when missingness was minimal and compatible with the assumptions of the selected procedure. Descriptive statistics, including means, standard deviations, observed ranges, skewness, and kurtosis, were calculated for online peer validation, contingent self-worth, social comparison, and anxiety. Internal consistency was evaluated using Cronbach's alpha and McDonald's omega. Preliminary assumptions for regression-based conditional process analysis were assessed by examining linearity, approximate normality of residuals, homoscedasticity,

independence of errors, and multicollinearity. Variance inflation factors and tolerance statistics were inspected to identify potentially problematic overlap among predictors. Pearson product-moment correlations were subsequently calculated to determine the magnitude and direction of the bivariate relationships among the principal study variables. Age, gender, and average daily social-media use were examined in relation to the outcome and retained as covariates where theoretically justified to reduce the possibility that the estimated conditional effects merely reflected demographic or general social-media exposure differences.

The hypothesized model was tested as a second-stage moderated mediation model in which online peer validation served as the independent variable, contingent self-worth served as the mediator, adolescent anxiety served as the dependent variable, and social comparison orientation served as the moderator of the relationship between contingent self-worth and anxiety. Accordingly, the first regression equation estimated the association between online peer validation and contingent self-worth, whereas the second equation simultaneously estimated the effects of online peer validation, contingent self-worth, social comparison, and the contingent self-worth $\times$ social comparison interaction on anxiety. Prior to construction of the interaction term, continuous predictor and moderator variables were mean-centered to facilitate interpretation and reduce nonessential multicollinearity. A statistically significant interaction effect was probed using conditional effects at relatively low, average, and relatively high levels of social comparison, operationalized as one standard deviation below the mean, the mean, and one standard deviation above the mean. Where appropriate, the Johnson-Neyman procedure was additionally used to determine the range of social comparison scores across which the conditional association between contingent self-worth and anxiety was statistically significant. The indirect association between online peer validation and anxiety through contingent self-worth was estimated conditionally across levels of social comparison using 5,000 bootstrap resamples. Bias-corrected 95% bootstrap confidence intervals were calculated for indirect effects, and an effect was considered statistically significant when its confidence interval did not include zero. Evidence for moderated mediation was evaluated using the index of moderated mediation, with a bootstrap confidence interval excluding zero interpreted as support for the proposition that the magnitude of the indirect relationship between online peer validation and anxiety

through contingent self-worth systematically varied as a function of adolescents' social comparison orientation. All statistical tests were two-tailed, and the level of statistical significance was set at $p < .05$. Unstandardized coefficients were retained for estimation and interpretation of interaction and indirect effects, while standardized coefficients were additionally reported where useful for comparing the relative magnitude of associations across variables.

3. Findings and Results

A total of 428 adolescents were included in the final analyses. Participants ranged in age from 13 to 18 years, with a mean age of 15.46 years ($SD = 1.43$). Of the total sample, 218 participants (50.93%) identified as girls, 198 (46.26%) identified as boys, and 12 (2.80%) identified as non-binary, another gender identity, or preferred not to specify their gender. In terms of geographic distribution, 255 participants (59.58%) attended secondary schools in Ontario and 173 (40.42%) attended schools in British Columbia. The sample

represented different secondary-school grade levels, with 64 participants (14.95%) in Grade 8, 82 (19.16%) in Grade 9, 91 (21.26%) in Grade 10, 99 (23.13%) in Grade 11, and 92 (21.50%) in Grade 12. Participants reported an average of 3.41 hours per day of social-media use ($SD = 1.72$), with considerable variation across the sample. Preliminary screening indicated that the proportion of missing responses was low and did not demonstrate a systematic pattern. No serious data-entry problems were detected, and inspection of standardized residuals, Mahalanobis distances, normal probability plots, and scatterplots did not indicate violations sufficiently severe to justify further case deletion. Skewness and kurtosis values for the principal study variables remained within acceptable ranges, tolerance values exceeded .50, and variance inflation factors were below 2.00, indicating that multicollinearity was not a substantive concern. Examination of residual plots also supported the assumptions of linearity and homoscedasticity. Therefore, all 428 eligible cases were retained for the primary correlational, regression, and moderated mediation analyses.

Table 1

Descriptive Statistics, Internal Consistency, and Correlations Among the Main Study Variables

Variable	M	SD	Observed Range	Cronbach's α	McDonald's ω	1	2	3	4
1. Online peer validation	24.86	6.32	8–40	.89	.90	—			
2. Contingent self-worth	42.18	9.47	15–67	.88	.89	.52***	—		
3. Social comparison	34.62	7.81	14–54	.86	.87	.41***	.48***	—	
4. Adolescent anxiety	8.74	4.96	0–21	.91	.91	.46***	.58***	.54***	—

As shown in Table 1, all four principal variables demonstrated satisfactory internal consistency, with Cronbach's alpha coefficients ranging from .86 to .91 and McDonald's omega coefficients ranging from .87 to .91. These coefficients exceeded the conventional criterion of .70 and indicated that the measures provided sufficiently reliable scores for subsequent conditional process analyses. Participants reported a mean online peer validation score of 24.86 ($SD = 6.32$), indicating substantial individual variation in the degree to which adolescents attached psychological importance to peer reactions received through social-media environments. The mean contingent self-worth score was 42.18 ($SD = 9.47$), whereas the mean social comparison score was 34.62 ($SD = 7.81$). The mean anxiety score was 8.74 ($SD = 4.96$), suggesting that the sample contained considerable variability in anxiety symptom severity rather than being restricted to adolescents with uniformly low or high levels of distress. Pearson correlation coefficients

showed that all hypothesized constructs were positively and significantly related. Online peer validation was moderately associated with contingent self-worth, $r = .52$, $p < .001$, indicating that adolescents who placed greater importance on online peer approval were also more likely to base their self-evaluation on external sources of worth. Online peer validation was additionally related to social comparison, $r = .41$, $p < .001$, and anxiety, $r = .46$, $p < .001$. Contingent self-worth demonstrated a relatively strong positive association with anxiety, $r = .58$, $p < .001$, while social comparison was also strongly associated with anxiety, $r = .54$, $p < .001$. The correlation between contingent self-worth and social comparison was $r = .48$, $p < .001$. The magnitude of the coefficients remained below levels typically indicative of construct redundancy, supporting the treatment of the variables as empirically distinguishable components of the proposed moderated mediation model.

Table 2

Regression Model Predicting Contingent Self-Worth from Online Peer Validation

Predictor	B	SE	β	t	p	95% CI for B
Constant	19.84	3.71	—	5.35	<.001	[12.55, 27.13]
Online peer validation	0.72	0.06	.48	11.61	<.001	[0.60, 0.84]
Age	0.31	0.24	.05	1.29	.198	[-0.16, 0.78]
Gender	0.46	0.65	.03	0.71	.478	[-0.82, 1.74]
Daily social-media use	0.68	0.21	.12	3.24	.001	[0.27, 1.09]
Model statistic	Value					
R	.56					
R ²	.31					
Adjusted R ²	.30					
F(4, 423)	47.52					
p	<.001					

Table 2 presents the first-stage mediation model in which contingent self-worth was regressed on online peer validation while controlling for age, gender, and average daily social-media use. The overall regression model was statistically significant, $F(4, 423) = 47.52$, $p < .001$, and accounted for 31% of the variance in contingent self-worth, $R^2 = .31$, adjusted $R^2 = .30$. Online peer validation emerged as a strong positive predictor of contingent self-worth, $B = 0.72$, $SE = 0.06$, $\beta = .48$, $t = 11.61$, $p < .001$, 95% CI [0.60, 0.84]. Thus, for each one-unit increase in online peer validation, contingent self-worth increased by approximately 0.72 units when the demographic covariates were held constant. The standardized coefficient further indicated that online peer validation was the strongest predictor included in the equation. Average daily social-

media use also showed a smaller but statistically significant positive association with contingent self-worth, $B = 0.68$, $SE = 0.21$, $\beta = .12$, $t = 3.24$, $p = .001$, suggesting that adolescents who spent more time on social-media platforms tended to report somewhat greater dependence of self-worth on external evaluation. In contrast, age, $B = 0.31$, $SE = 0.24$, $\beta = .05$, $p = .198$, and gender, $B = 0.46$, $SE = 0.65$, $\beta = .03$, $p = .478$, were not statistically significant predictors after online peer validation and social-media use were included in the model. The significant positive coefficient for online peer validation therefore supported the hypothesized first component of the mediation process, according to which greater psychological reliance on digital peer approval was associated with greater contingent self-worth.

Table 3

Moderated Regression Model Predicting Adolescent Anxiety

Predictor	B	SE	β	t	p	95% CI for B
Constant	8.57	0.20	—	42.85	<.001	[8.18, 8.96]
Online peer validation	0.10	0.04	.13	2.77	.006	[0.03, 0.17]
Contingent self-worth	0.19	0.02	.36	8.37	<.001	[0.15, 0.24]
Social comparison	0.17	0.03	.27	6.30	<.001	[0.12, 0.22]
Contingent self-worth $\times$ Social comparison	0.012	0.003	.15	4.18	<.001	[0.006, 0.018]
Age	0.18	0.12	.05	1.50	.134	[-0.06, 0.42]
Gender	0.29	0.33	.03	0.88	.381	[-0.36, 0.94]
Daily social-media use	0.22	0.11	.08	2.05	.041	[0.01, 0.43]
Model statistic	Value					
R	.70					
R ²	.49					
Adjusted R ²	.48					
F(7, 420)	57.65					
p	<.001					
ΔR^2 attributable to interaction	.021					
F for ΔR^2	17.47					
p for ΔR^2	<.001					

As presented in Table 3, the complete moderated regression model predicting adolescent anxiety was statistically significant, $F(7, 420) = 57.65, p < .001$, explaining 49% of the variance in anxiety scores, with an adjusted R^2 of .48. Online peer validation retained a statistically significant direct association with anxiety after the mediator, moderator, interaction term, and covariates were entered into the model, $B = 0.10, SE = 0.04, \beta = .13, t = 2.77, p = .006$. This finding indicated that adolescents who reported greater dependence on online peer approval tended to report greater anxiety even after accounting for contingent self-worth and social comparison. Contingent self-worth was a substantial positive predictor of anxiety, $B = 0.19, SE = 0.02, \beta = .36, t = 8.37, p < .001$, demonstrating that stronger dependence of self-evaluation on external approval was associated with increased anxiety symptoms. Social comparison independently predicted anxiety as well, $B = 0.17, SE = 0.03, \beta = .27, t = 6.30, p < .001$, indicating that adolescents who more frequently evaluated themselves

relative to others reported greater anxiety. Most importantly, the interaction between contingent self-worth and social comparison was statistically significant, $B = 0.012, SE = 0.003, \beta = .15, t = 4.18, p < .001, 95\% CI [0.006, 0.018]$. Inclusion of the interaction term accounted for an additional 2.1% of the variance in anxiety, $\Delta R^2 = .021, F = 17.47, p < .001$. The positive direction of this interaction indicated that the relationship between contingent self-worth and anxiety became progressively stronger as adolescents' social comparison orientation increased. Among the covariates, average daily social-media use demonstrated a small positive association with anxiety, $B = 0.22, SE = 0.11, \beta = .08, p = .041$, whereas age and gender were not significant independent predictors. Collectively, these findings supported the proposed moderation hypothesis and justified examination of the conditional indirect relationship between online peer validation and anxiety through contingent self-worth across different levels of social comparison.

Table 4

Conditional Effects and Conditional Indirect Effects at Different Levels of Social Comparison

Social comparison level	Moderator value	Conditional effect of contingent self-worth on anxiety (B)	SE	t	p	95% CI	Conditional indirect effect of online peer validation on anxiety through contingent self-worth	Boot SE	Boot 95% CI
Low (-1 SD)	26.81	0.10	0.03	3.67	<.001	[0.05, 0.15]	0.07	0.02	[0.03, 0.11]
Mean	34.62	0.19	0.02	8.37	<.001	[0.15, 0.24]	0.14	0.03	[0.09, 0.19]
High (+1 SD)	42.43	0.28	0.03	9.09	<.001	[0.22, 0.35]	0.20	0.04	[0.14, 0.27]
Moderated mediation statistic				Estimate		Boot SE		Boot 95% CI	
Index of moderated mediation				0.009		0.003		[0.004, 0.015]	

The conditional effect analysis presented in Table 4 clarified the nature of the statistically significant interaction. At a relatively low level of social comparison, defined as one standard deviation below the mean, the association between contingent self-worth and anxiety remained positive and statistically significant, $B = 0.10, SE = 0.03, t = 3.67, p < .001, 95\% CI [0.05, 0.15]$. At the mean level of social comparison, this association increased to $B = 0.19, SE = 0.02, t = 8.37, p < .001, 95\% CI [0.15, 0.24]$. At a relatively high level of social comparison, defined as one standard deviation above the mean, the conditional association became substantially stronger, $B = 0.28, SE = 0.03, t = 9.09, p < .001, 95\% CI [0.22, 0.35]$. Thus, although contingent self-worth was associated with anxiety across all examined levels of social comparison, its association with anxiety was

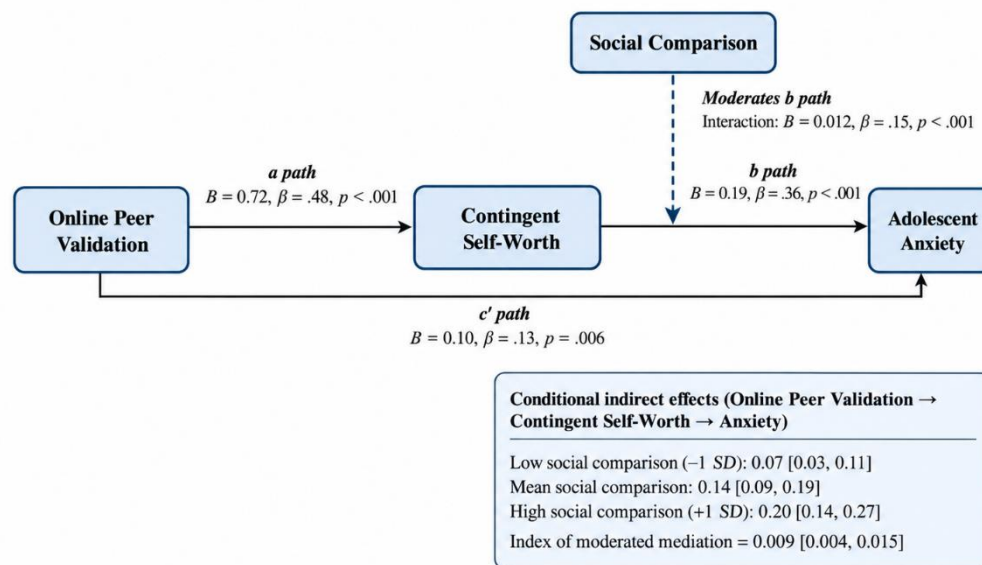
nearly three times as large among adolescents characterized by relatively high social comparison orientation compared with those characterized by relatively low social comparison orientation. The conditional indirect effects demonstrated a corresponding pattern. At low social comparison, the indirect effect of online peer validation on anxiety through contingent self-worth was 0.07, Boot SE = 0.02, 95% bootstrap CI [0.03, 0.11]. At the mean level of social comparison, the indirect effect increased to 0.14, Boot SE = 0.03, 95% bootstrap CI [0.09, 0.19], while at high social comparison the indirect effect increased further to 0.20, Boot SE = 0.04, 95% bootstrap CI [0.14, 0.27]. Because none of these bootstrap confidence intervals contained zero, the indirect relationship was statistically significant at all three representative levels of the moderator. More importantly, the

index of moderated mediation was statistically different from zero, index = 0.009, Boot SE = 0.003, 95% bootstrap CI [0.004, 0.015], providing direct statistical evidence that the indirect association between online peer validation and adolescent anxiety through contingent self-worth varied systematically according to adolescents' social comparison orientation. In substantive terms, online peer validation was associated with stronger externally contingent self-worth, which in turn was associated with greater anxiety, but the latter association—and consequently the overall indirect

pathway—was substantially stronger among adolescents who habitually compared themselves with other people. The persistence of a significant direct association between online peer validation and anxiety after the mediator was included further indicated partial rather than complete mediation, suggesting that online peer validation may contribute to anxiety through contingent self-worth as well as through additional psychological pathways not represented in the present model.

Figure 1

Moderated Mediation Model of the Association Between Online Peer Validation and Adolescent Anxiety Through Contingent Self-Worth at Different Levels of Social Comparison



Note. Coefficients are unstandardized B values with standardized β shown where relevant. Dashed arrow indicates moderation of the Contingent Self-Worth → Anxiety path by Social Comparison.

The pattern represented in Figure 1 summarizes the conditional process model supported by the analyses. Online peer validation demonstrated a significant positive association with contingent self-worth, establishing the first stage of the indirect pathway. Contingent self-worth was subsequently associated with anxiety, but the magnitude of this relationship depended significantly on adolescents' level of social comparison. The positive slope connecting contingent self-worth with anxiety became progressively steeper as social comparison increased, indicating that adolescents whose self-worth was highly dependent on external approval were especially vulnerable to anxiety when they also exhibited a strong tendency to evaluate themselves in relation to others. Consequently, the indirect association between online peer validation and anxiety through contingent self-worth was weakest at low levels of

social comparison, stronger at average levels, and strongest at high levels of social comparison. The significant index of moderated mediation confirmed that these differences in indirect effects were statistically meaningful rather than attributable to sampling fluctuation. The overall pattern therefore supported the proposed second-stage moderated mediation model and demonstrated that contingent self-worth functioned as an explanatory mechanism linking online peer validation with adolescent anxiety, while social comparison operated as an amplifying condition that increased the psychological impact of externally contingent self-evaluation on anxiety symptoms.

4. Discussion

The present study examined a moderated mediation model linking online peer validation, contingent self-worth, social comparison, and anxiety among Canadian adolescents. The findings supported the proposed model and indicated that online peer validation was positively associated with contingent self-worth, that contingent self-worth was positively associated with adolescent anxiety, and that social comparison significantly strengthened the relationship between contingent self-worth and anxiety. Online peer validation also retained a significant direct association with anxiety after the mediator and moderator were taken into account, indicating partial rather than complete mediation. In addition, the conditional indirect effect of online peer validation on anxiety through contingent self-worth increased systematically across low, average, and high levels of social comparison. The significant index of moderated mediation confirmed that the indirect pathway was not constant across adolescents but became stronger as social comparison orientation increased. Taken together, the findings suggest that digital peer approval may contribute to anxiety partly because adolescents come to base their sense of personal value on external feedback, and that this process becomes particularly consequential when adolescents frequently evaluate themselves in relation to others. This pattern is consistent with a broader literature showing that the psychological effects of digital environments depend less on exposure alone than on the interpersonal meaning, evaluative context, and individual vulnerabilities associated with online engagement (Kostyrka-Allchorne et al., 2022; Marano et al., 2025; Prochnow et al., 2025).

The first major finding was that online peer validation significantly predicted contingent self-worth. Adolescents who placed greater importance on likes, comments, reactions, and other forms of peer feedback were more likely to report a self-evaluative orientation that depended on external approval. This result is theoretically plausible because social-media platforms make social evaluation unusually visible, immediate, and quantifiable. Traditional peer approval can be ambiguous or dispersed across interactions, whereas online platforms translate approval into countable signals that can be repeatedly checked and compared. Such conditions may encourage adolescents to use external reactions as indicators of acceptance and personal adequacy. This interpretation is consistent with evidence that the characteristics of social-media activity are

important for understanding adolescent mental health, particularly when online engagement is strongly evaluative or socially comparative (Yang et al., 2025). Research on fear of missing out and peer influence similarly suggests that social-media experiences can heighten sensitivity to peer norms and peer behavior (Ngo et al., 2024). The present results therefore extend previous work by suggesting that one consequence of repeated online validation seeking may be a stronger tendency to condition self-worth on interpersonal approval. This mechanism may be particularly important during adolescence, when peer evaluation occupies a central role in identity development and social belonging.

The observed association between online peer validation and contingent self-worth also corresponds with research emphasizing the emotional significance of peer-related evaluation. Adolescents are developmentally sensitive to social threat, rejection, and negative appraisal, and these sensitivities can become especially salient in digital contexts where audience size and visibility are amplified. Studies of peer victimization have shown that adverse peer experiences are associated with internalizing difficulties, including anxiety and depressive symptoms (Hui et al., 2026; Schacter, 2022). Daily assessments have further demonstrated that peer victimization can be associated with anxious affect, particularly among adolescents who are more sensitive to social threat (Schacter et al., 2025). Although online peer validation is conceptually distinct from peer victimization, both involve the interpretation of peer responses as indicators of social standing. The present findings suggest that even in the absence of overt hostility, adolescents may become vulnerable when positive peer feedback acquires excessive importance for self-evaluation. This may help explain why apparently positive online interactions can still be psychologically risky when adolescents depend on them to maintain a stable sense of worth.

The second major finding was that contingent self-worth significantly predicted anxiety. Adolescents whose self-esteem depended more strongly on external approval reported higher levels of anxiety, even after controlling for online peer validation, social comparison, and demographic covariates. This finding supports the view that contingent self-worth is not merely an outcome of social evaluation but also an important mechanism through which evaluative environments can become emotionally destabilizing. When personal worth is dependent on approval, maintaining self-esteem requires continual confirmation that one is accepted, attractive, competent, or socially successful. Because such

confirmation cannot be fully controlled, uncertainty itself may become a source of vigilance and worry. The result is consistent with research showing that contingent self-esteem can mediate relationships between interpersonal experiences and anxiety-related outcomes (Németh & Bernáth, 2022). It is also compatible with evidence that adolescents experience distress in response to perceived social judgment and fear of negative evaluation (Niu et al., 2023). The present findings therefore suggest that contingent self-worth may help translate ordinary peer feedback into a broader anxiety vulnerability by making social evaluation central to the maintenance of self-esteem.

The relationship between contingent self-worth and anxiety also fits with evidence concerning identity performance and appearance-related social evaluation. Adolescents may experience pressure to present themselves in ways that correspond to socially valued standards, and this pressure can be particularly pronounced in environments where identity and appearance are continuously visible to peers. Qualitative work has suggested that performing socially expected forms of femininity can be associated with lower well-being among adolescent girls (Hensler & Emmott, 2025). Longitudinal research has also shown that appearance-related social-media use can be linked with body dissatisfaction and competitive anxiety among adolescents (Zhang et al., 2026). These studies support the broader interpretation that when adolescents' self-evaluation becomes dependent on meeting socially visible standards, anxiety may intensify because self-worth becomes vulnerable to perceived discrepancies, criticism, or insufficient validation. The present study extends this reasoning beyond appearance alone by showing that a more general externally contingent sense of self-worth is associated with anxiety in the context of online peer validation.

The third major finding concerned the moderating role of social comparison. Social comparison significantly strengthened the association between contingent self-worth and anxiety, such that the relationship was weakest among adolescents with relatively low comparison orientation and strongest among those with relatively high comparison orientation. This finding provides an important explanation for why contingent self-worth may not affect all adolescents equally. Adolescents who frequently compare themselves with peers are more likely to interpret external approval in relative rather than absolute terms. Receiving positive feedback may therefore provide limited reassurance if peers appear to receive more recognition, attention, or approval.

Conversely, low levels of feedback may become particularly threatening when adolescents are simultaneously exposed to curated representations of others' popularity, appearance, achievements, or social relationships. This interpretation aligns with research indicating that the effects of social media vary according to the specific content and social processes involved in online activity (Yang et al., 2025). It is also consistent with evidence that adolescent social-media experiences influence peer-related perceptions and fear of missing out (Ngo et al., 2024). The present results therefore suggest that social comparison acts as an amplifier that increases the emotional cost of basing self-worth on external validation.

The moderation effect is also compatible with research emphasizing the importance of referents in adolescent social cognition. Judgments about trust, acceptance, adequacy, and social position are often referent-specific, meaning that adolescents evaluate themselves differently depending on whom they use as a comparison standard (Mo et al., 2024). In digital settings, the pool of available comparison targets is greatly expanded, and adolescents can compare themselves not only with close friends but also with acquaintances, popular peers, influencers, and idealized online identities. This environment can make unfavorable comparisons more frequent and can increase the perceived instability of social standing. Digital stress research increasingly recognizes such processes as distinct forms of psychological burden, with measures capturing pressures related to availability, evaluation, overload, and social monitoring (Geckalan, 2026; Nagel & Kruse, 2026). The present findings add to this literature by showing that comparison orientation has a specific moderating function: it intensifies the link between contingent self-worth and anxiety rather than merely operating as another independent risk factor.

The conditional indirect effects provided particularly strong support for the hypothesized model. Online peer validation was associated with anxiety through contingent self-worth at all three examined levels of social comparison, but the magnitude of the indirect effect increased from low to average to high comparison orientation. This pattern indicates that contingent self-worth serves as a meaningful explanatory mechanism even among adolescents who do not strongly compare themselves with others, but that the pathway becomes considerably more powerful among those who engage in frequent comparison. The significant index of moderated mediation confirmed that this difference was statistically reliable. This result is conceptually consistent

with prior moderated mediation research showing that peer-related adversity can influence adolescent emotional outcomes through intervening mechanisms whose strength depends on individual or contextual moderators (Hui et al., 2026). More broadly, it supports the argument that adolescent mental health outcomes are rarely produced by single direct pathways and are better understood through conditional process models that account for both mechanisms and susceptibility factors.

The persistence of a direct association between online peer validation and anxiety after contingent self-worth was included is also noteworthy. This finding indicates partial mediation and suggests that contingent self-worth explains only one part of the relationship between online peer validation and anxiety. Other mechanisms may include fear of exclusion, emotional dependence on social feedback, social vigilance, co-rumination, cybervictimization, or difficulty disengaging from digital environments. Online support seeking, for example, can sometimes coexist with co-rumination and psychological distress rather than functioning as a uniformly protective process (Mackenzie et al., 2023). Similarly, systematic evidence indicates that digital experiences may have different consequences depending on whether they involve supportive connection, conflict, comparison, or social threat (Kostyrka-Allchome et al., 2022; Prochnow et al., 2025). Cyberbullying studies further demonstrate that harmful digital interactions are associated with social anxiety and broader mental health difficulties (Cañas et al., 2026; Mohedo et al., 2026). Accordingly, online peer validation may affect anxiety through several overlapping pathways, of which contingent self-worth is an important but not exclusive component.

The findings also need to be interpreted within the broader context of elevated adolescent mental health vulnerability. Research conducted during and after the COVID-19 pandemic has demonstrated sustained increases in anxiety and depressive symptoms among adolescents and has highlighted the importance of interpersonal disruption, family support, and social isolation (Barbieri et al., 2022; Cochran et al., 2023; Silk et al., 2021; Skinner et al., 2023). Qualitative evidence has similarly documented adolescents' experiences of stress and anxiety within changing family and social environments (Çetin & Ata, 2022). These studies demonstrate that adolescent anxiety is shaped by multiple interacting environments, and digital social life should therefore be understood as one component of a broader psychosocial ecology. The present study contributes to this literature by identifying a specific pathway through which

everyday online peer dynamics may become linked with anxiety, particularly when adolescents' self-worth is externally contingent and their tendency toward social comparison is high.

The results also have implications for understanding why generalized measures of social-media use often produce inconsistent associations with mental health. Simply measuring hours spent online may obscure the psychological processes that determine whether digital engagement becomes beneficial, neutral, or harmful. The present findings suggest that the meaning of engagement is critical. An adolescent who uses social media primarily for communication or entertainment may experience very different consequences from one who continually monitors peer reactions and interprets them as indicators of personal value. This interpretation accords with evidence that different social-media activities have distinct relationships with mental health (Yang et al., 2025). It is also consistent with broader reviews concluding that digital experiences are heterogeneous and that researchers should move beyond simplistic exposure models (Marano et al., 2025; Prochnow et al., 2025). Advances in digital mental health intervention design similarly emphasize the importance of understanding adolescents' actual experiences, needs, and preferences rather than treating digital engagement as a uniform phenomenon (Kornfield et al., 2024). Thus, the present study supports a shift from screen-time-centered explanations toward process-oriented models focusing on validation, self-evaluation, and comparison.

5. Conclusion

The study contributes to the broader literature on adolescent assessment and mental health by demonstrating the value of distinguishing specific psychological processes within general anxiety. Anxiety in adolescents can manifest in relation to different domains, including school tasks, social evaluation, peer relationships, and broader worry, and measurement research has emphasized the importance of construct specificity (Jones et al., 2025). Research on fear of negative evaluation likewise suggests that socially evaluative processes may predict specific anxiety responses more strongly than undifferentiated global anxiety (Niu et al., 2023). Ecological approaches have also emphasized that adolescents' emotional experiences fluctuate across daily contexts and interpersonal situations (Murray et al., 2023). Although the present study used a cross-sectional design, the supported model suggests a plausible everyday process in

which online feedback influences contingent self-evaluation and, under conditions of high social comparison, contributes to anxious affect. Future work examining these processes in real time may therefore provide an even more detailed account of their temporal dynamics.

6. Limitations & Suggestions

The present study has several limitations that should be considered when interpreting the findings. First, the cross-sectional design prevents firm conclusions regarding temporal ordering or causality; although the hypothesized model treated online peer validation as a predictor of contingent self-worth and anxiety, reciprocal or bidirectional relationships are also possible. Second, all principal variables were assessed using self-report measures, which may introduce shared-method variance, recall bias, social desirability, and individual differences in interpretation of questionnaire items. Third, the sample was drawn from public secondary schools in Ontario and British Columbia, and although it included adolescents across several grade levels, the findings may not generalize to all Canadian adolescents, particularly those attending private schools, living in rural or northern communities, or belonging to cultural and socioeconomic groups underrepresented in the sample. Fourth, the measure of online peer validation was developed for the present study and, despite preliminary content and psychometric evaluation, requires further validation across independent samples. Fifth, social-media platforms differ considerably in their feedback structures and norms, and the study did not test whether the model varied across specific platforms or types of digital interaction. Finally, the study focused on generalized anxiety symptoms and did not distinguish social anxiety, appearance-related anxiety, fear of negative evaluation, or other potentially relevant forms of internalizing distress.

Future research should employ longitudinal, experimental, and intensive repeated-measures designs to clarify the temporal relationships among online peer validation, contingent self-worth, social comparison, and anxiety. Multi-wave studies could determine whether repeated dependence on online validation predicts subsequent increases in contingent self-worth and whether these changes prospectively contribute to anxiety. Ecological momentary assessment could examine how daily fluctuations in peer feedback, comparison, and self-evaluation correspond with momentary anxious affect. Future studies should also test alternative moderated

mediation configurations, including whether social comparison moderates the first stage of the indirect pathway or whether contingent self-worth itself moderates responses to online validation. Greater attention should be given to platform-specific processes, including public like counts, follower metrics, image-based posting, algorithmic recommendations, and disappearing content. Researchers should also examine developmental, gender, cultural, socioeconomic, and personality differences in susceptibility to these processes. Replication with clinical samples and adolescents with elevated social anxiety would help determine whether the model is especially relevant to high-risk populations. Finally, future studies should validate the online peer validation construct using confirmatory factor analysis, measurement invariance testing, informant reports, and behavioral or digital trace indicators where ethically appropriate.

In practice, the findings suggest that adolescent mental health interventions should address not only the amount of time young people spend online but also the psychological meaning they assign to digital peer feedback. School counselors, psychologists, educators, and parents may benefit from helping adolescents recognize when likes, comments, views, and follower responses are becoming central indicators of personal worth. Interventions could incorporate psychoeducation about the instability of externally contingent self-esteem, exercises that strengthen more autonomous and multidimensional sources of self-worth, and strategies for identifying and challenging unhelpful comparison habits. Digital literacy programs should teach adolescents how curated online content can distort perceptions of peers' success, popularity, appearance, and emotional well-being. Counseling approaches may also encourage adolescents to diversify sources of belonging and competence across family, friendships, school, hobbies, physical activity, creativity, and community participation. For adolescents who are highly comparison oriented, targeted cognitive and behavioral strategies may be especially useful in reducing repetitive monitoring of peer metrics and strengthening tolerance for ambiguous or limited online feedback. At the institutional level, schools and youth services could integrate discussions of validation seeking, social comparison, and digital self-worth into broader prevention programs addressing anxiety and healthy social-media use.

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Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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Authors' Contributions

All authors equally contributed to this article.

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