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Adolescent psychological resilience and subjective well-being: A meta-analysis

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Abstract: A meta-analysis was conducted to systematically examine the relationship between adolescent psychological resilience and subjective well-being, including its tripartite components and potential moderators. Relevant literature was systematically searched across domestic and international databases, yielding 112 eligible studies comprising 115 independent samples (N = 78,018 adolescents). Significant positive correlations were identified between psychological resilience and both subjective well-being (r = 0.508, p < 0.001) and its components: life satisfaction (r = 0.470, p < 0.001) and positive affect (r = 0.465, p < 0.001). A weak negative correlation emerged with negative affect (r = −0.253, p < 0.001). Heterogeneity analysis revealed substantial between-study variance, suggesting significant moderator effects. Moderator analysis demonstrated significant cultural influences with Western cultural contexts showing stronger associations (r = 0.641, p < 0.001) than Eastern counterparts (r = 0.499, p < 0.001). Psychological resilience measurement instruments also served as significant moderators, particularly for the associations with positive and negative affect. Specifically, the Connor-Davidson Resilience Scale (CD-RISC) demonstrated stronger correlations with positive affect, while the Resilience Trait Scale for Chinese Adolescents (RTSCA) showed stronger inverse correlations with negative affect. These findings elucidate the complex interplay between psychological resilience and subjective well-being while informing targeted intervention strategies.

Keywords: teenagers; subjective well-being; mental resilience; meta-analysis

Introduction

The advent of positive psychology has positioned subjective well-being (SWB) as a pivotal metric in mental health assessment (Seligman et al., 2005). Subjective well-being (SWB) comprises three components: life satisfaction, positive affect, and negative affect (Buecker et al., 2023; Busseri & Sadava, 2011; Şimşek, 2009; Vladisavljević & Mentus, 2019). Elevated SWB correlates with enhanced psychophysiological functioning, reduced maladaptive behavioral patterns, and greater occupational commitment (Diener et al., 1999; Fredrickson & Joiner, 2002; Gan & Cheng, 2021). Over decades, SWB research has demonstrated robust positive associations with occupational performance and social relational quality (Diener et al., 2018).

Emerging evidence identifies psychological resilience as a significant predictor of SWB variance across populations (Chuning et al., 2024). Resilience functions as a protective factor mitigating negative emotional impacts while enhancing SWB (Israelashvili, 2021). As a multidimensional adaptive capacity, resilience enables successful navigation through adversity and stressogenic environments (Masten, 2018; Masten et al., 2021; Troy et al., 2023).

While a general positive association between resilience and SWB is established, the magnitude and consistency of this relationship remain unclear, particularly among adolescents. While existing meta-analytic work has focused on elderly populations (Ye & Zhang, 2021), documented age-specific variations in resilience trajectories (Blanco-García et al., 2021) necessitate targeted investigation of adolescent resilience-SWB dynamics. Crucially, Previous individual studies have reported inconsistent findings, with effects ranging from negligible to exceptionally strong, highlighting significant heterogeneity that remains unexplained.

Despite extensive empirical attention, the resilience-SWB relationship exhibits substantial heterogeneity across studies. While predominant findings report positive correlations (Ma, 2023; Sorrenti et al., 2022; Wan et al., 2023), null associations (Jiang & Chen, 2020) and inverse relationships (Akintunde et al., 2023) have also been documented. Reported effect sizes demonstrate remarkable variability, ranging from negligible (r = 0.001) to exceptionally strong (r = 0.940) across studies (Eldeleklioğlu & Yıldız, 2020; Jiang & Chen, 2020). The potential moderating effects of participant characteristics (e.g., cultural background) and methodological factors (e.g., assessment instruments) remain insufficiently elucidated. To address these knowledge gaps, this meta-analysis employs threefold objectives: (1) quantifying the population-level correlation between adolescent resilience and SWB, (2) identifying salient moderators of this association, and (3) providing empirical foundations for targeted intervention development.

Psychological resilience and subjective well-being

Empirical findings regarding the resilience-SWB association in adolescents are marked by substantial inconsistency, creating a critical need for systematic synthesis and explanation.

As a core construct in positive psychology, psychological resilience has been demonstrated to exert substantial influence on mental health outcomes (Ungar & Theron, 2020). While a general positive association is often reported (Moreira et al., 2021; Sorrenti et al., 2022), the

literature reveals dramatic variability, with effects ranging from negligible (e.g., $r = 0.001$; Jiang & Chen, 2020) to exceptionally strong (e.g., $r = 0.94$; Eldeleklioğlu & Yıldız, 2020). Such divergent findings suggest that the relationship is not monolithic but is likely contingent upon a range of methodological, developmental, and cultural factors. This pronounced variability underscores the complexity of the association and indicates the presence of unidentified moderating factors. Notwithstanding these discrepancies, resilience is widely recognized as a critical determinant of SWB variations. Based on this empirical foundation, Hypothesis 1 (H1) is formulated: Psychological resilience is positively associated with subjective well-being.

Moderating variables influencing the relationship between psychological resilience and subjective well-being

The inconsistencies could be by moderators yet to be examined. We propose that the variability in effect sizes is systematically influenced by cultural, methodological, and developmental factors, which form the theoretical basis for our moderator analyses.

Cultural context may systematically influence resilience-SWB dynamics by shaping the very expression and function of these constructs. Cross-cultural studies demonstrate divergent resilience manifestations, with Spanish populations showing heightened stress sensitivity yet elevated resilience capacities (Palomera et al., 2022; Topçu & Dinç, 2024). SWB exhibits substantial cross-national variability, as evidenced by 30-nation comparisons revealing significant intercountry differences (Moreta-Herrera et al., 2023; Rajkumar, 2023; Suh et al., 1998). Critically, cultural values (e.g., individualism vs. collectivism) may alter how resilience resources translate into well-being outcomes. For instance, in collectivistic cultures, resilience might be more tightly linked to relational harmony and familial support, whereas in individualistic cultures, it may correlate more strongly with personal achievement and autonomy. These fundamental differences provide a compelling theoretical rationale for why the resilience-SWB correlation might vary significantly across cultural contexts. Hypothesis 2 (H2): Cultural typology moderates the resilience-SWB relationship.

Measurement heterogeneity constitutes a critical methodological consideration that may influence observed resilience-SWB associations. Various instruments operationalize psychological resilience through distinct conceptual frameworks and dimensional structures (Table 1). For instance, the Connor-Davidson Resilience Scale (CD-RISC; Connor & Davidson, 2003) assesses domains such as personal competence and stress tolerance, while its Chinese adaptation emphasizes tenacity, strength, and optimism (Yu & Zhang, 2007). The Resilience Scale for Chinese Adolescents (RSCA; Hu & Gan, 2008) focuses on contextually relevant adaptive capacities including goal planning and family support. Comparatively, the Resilience Scale for Adults (RSA; Friborg et al., 2003) measures factors including personal competence and social resources. These instrument-specific conceptualizations are not merely technical differences; they reflect fundamentally different emphases on what constitutes resilience. Consequently, a scale focusing on positive traits (e.g., CD-RISC) might show a stronger correlation with positive affect, while a scale emphasizing coping with distress (e.g., RSCA) might correlate more strongly with negative affect. Furthermore, conceptual overlap between certain resilience dimensions (e.g., optimism) and well-being components can artificially inflate correlations. This theoretical framework directly predicts that the choice of measurement instrument will systematically moderate the observed effect size. These instrument-specific conceptualizations may differentially capture resilience constructs, potentially moderating the observed relationships with SWB components. Hypothesis 3 (H3): Resilience measurement instruments moderate the resilience-SWB relationship.

Developmental stages may moderate adolescent resilience-SWB associations due to normative changes in

Table 1. Representative scales of psychological resilience

Author	Scale name	Dimensions
Connor and Davidson (2003)	The Connor-Davidson Resilience Scale (CD-RISC)	Personal competence, High standards, and Tenacity; Trust in one's instincts, tolerance of negative affect, and strengthening effects of stress; Positive acceptance of change and secure relationships; Control; Spiritual influences
Hu and Gan (2008)	Resilience Scale for Chinese Adolescents (RSCA)	Goal planning; Help-seeking; Family support; Affect control; Positive thinking
Friborg et al. (2003)	The Resilience Scale for Adults (RSA)	Personal capability, Social capability, Family cohesion, Social support, Personal structure
Liang and Cheng (2012)	Resilient Trait Scale for Chinese Adults (RTSCA)	Internal locus of control; Coping style focused on problem-solving; Optimism; Predisposition of accepting and utilizing social supports; Acceptance
Windle et al. (2008)	The Psychological Resilience (PRS)	Self-esteem; Personal capability; Interpersonal control
Wagnild and Young (1993)	The Resilience Scale (RS)	Calmness; Persistence; Self-confidence; Sense of well-being; Meaningful life experiences

psychological capacities and social demands. Enhanced social-cognitive maturation in older adolescents may strengthen these correlations (Wo, 2019). Positive age-resilience gradients have been documented, with older cohorts demonstrating superior resilience (Lim et al., 2025). Comparative studies reveal higher SWB levels in junior high students vs. university populations (Wu et al., 2020). Theoretically, the link between resilience and SWB might strengthen with age as adolescents develop more sophisticated emotion regulation and cognitive reframing skills. Conversely, the specific developmental challenges faced at different stages (e.g., identity formation in late adolescence vs. academic pressure in mid-adolescence) might alter how resilience manifests and connects to well-being. These developmental differences provide a clear rationale for expecting the strength of the association to vary across educational stages. SWB trajectories exhibit distinct developmental patterns across the lifespan (Blanchflower & Oswald, 2008). Hypothesis 4 (H4): Adolescent developmental stage moderates the resilience-SWB relationship.

Methods

Literature search and selection

Meta-analysis represents a quantitative approach that systematically combines results from multiple independent studies to derive more precise estimates of effects and examine sources of heterogeneity. This study adhered to PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines throughout the research process (Page et al., 2021).

First, a systematic literature search was conducted across eight English databases (Web of Science, Elsevier SD, Medline, EBSCO-ERIC, SAGE Online Journals, PsycINFO, PsycArticles, and ProQuest Dissertations and Theses) using title/abstract keywords related to psychological resilience and subjective well-being. The search strategy employed the following Boolean operators: ("resilience" or "psychological resilience" or "mental toughness") for psychological resilience concepts, and ("subjective well-being" or "well-being" or "happiness" or "positive emotions" or "negative emotions") for subjective well-being components. Subsequently, complementary searches were performed in three Chinese databases: China National Knowledge Infrastructure (CNKI), Wanfang Data, and VIP Chinese Journal Database, encompassing both journal articles and dissertation repositories. A combined search matrix was created by systematically pairing resilience-related terms with well-being indicators across all databases. The search encompassed publications up to October 2024, yielding an initial pool of 30,683 records after duplicate removal.

All records were imported into Zotero reference management software and screened against eight inclusion criteria: (1) empirical studies excluding theoretical/review papers; (2) quantitative measurement of both constructs with reportable correlation coefficients (r-values) or convertible statistics; (3) exclusion of non-questionnaire methodologies; (4) explicit sample size reporting; (5) inclusion of multiple publication types; (6) removal of duplicate datasets; (7) adolescent samples ($\geq$12 years) without clinical conditions; (8) exclusion of alternative well-being constructs. The final meta-analysis incorporated 112 qualified publications containing 115 independent studies, with a combined sample size of 78,018 participants meeting all inclusion criteria (see Figure 1 for PRISMA flow diagram).

Literature quality assessment and coding

Study quality was assessed using an adapted Jadad scale (Zhang et al., 2019), which was selected for its comprehensive coverage of methodological rigor domains relevant to observational studies in psychological research. The Jadad scale was preferred over other quality assessment tools because it provides a balanced evaluation across multiple dimensions including sampling methodology, psychometric properties, and publication standards, making it particularly suitable for assessing the quality of correlation studies included in this meta-analysis.

Quality assessment was conducted across four domains: (1) Participant selection: Randomized sampling (2 points), non-randomized (1 point), unreported (0 points); (2) Data validity ratio: $\geq$0.90 (2 points), 0.80–0.89 (1 point), $<$0.80/unreported (0 points); (3) Instrument reliability: Cronbach's $\alpha \geq 0.80$ (2 points), 0.70–0.79 (1 point), $<$0.70/unreported (0 points); (4) Publication tier: CSSCI/SSCI journals (2 points), Peking University core journals (1 point), non-peer-reviewed publications (0 points). Total scores ranged 0–10, with higher scores indicating superior methodological rigor.

Systematic coding was performed for: authorship, publication year, cultural context, correlation coefficients, sample size, female proportion, study quality scores, and resilience instrumentation (see Table 1). Pearson's r served as the effect size metric, extracted under five protocols: (1) Independent samples from multi-sample studies were coded separately; (2) Subgroup analyses (e.g., gender-specific) were extracted individually; (3) Baseline data prioritized for longitudinal designs; (4) Dimension-level correlations were aggregated via Fisher's z-transformation; (5) Alternative statistics (t, χ^2, F, β) were converted to r values using established formulae (Peterson & Brown, 2005).

When studies reported multiple effect sizes for different SWB components (life satisfaction, positive affect, negative affect) or multiple independent samples, we employed the following approach:

(1) For studies reporting correlations between resilience and different SWB components, each correlation was treated as an independent effect size to preserve the specificity of relationships with distinct well-being dimensions.
(2) For studies with multiple independent samples (e.g., different participant groups), each sample was coded separately.
(3) For studies reporting both overall SWB scores and component scores, we prioritized the component scores to maintain analytical precision, while the overall scores were included in supplementary analyses to ensure comprehensive coverage.

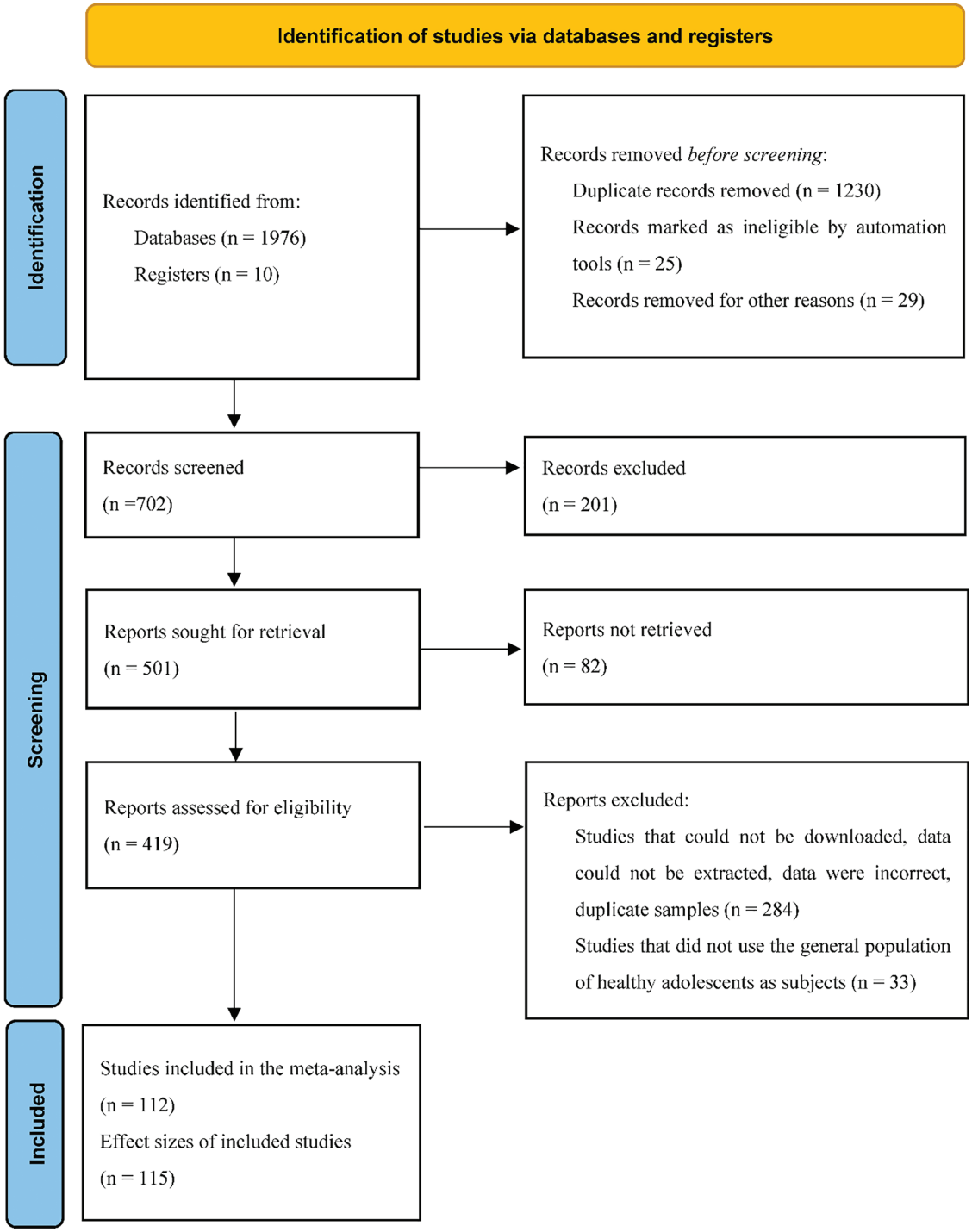

Figure 1. PRISMA flow diagram of literature search and inclusion process

This approach allowed us to examine the nuanced relationships between resilience and specific well-being components while maintaining statistical independence of effect sizes. The random-effects model used in our analyses inherently accommodates some degree of dependence through its variance components structure.

A dual independent coding procedure was implemented for study characteristics (participant demographics, female ratio, etc.). Intercoder reliability was high (Cohen's $\kappa = 0.92$), and inter-coder discrepancies were resolved through consensus-based reconciliation with source materials, with final coded data presented in Table 2.

Publication bias control and testing

Publication bias, characterized by the preferential publication of studies with statistically significant results, poses a significant threat to the validity of meta-analytic findings due to the systematic exclusion of non-significant outcomes. To address this bias, the current study incorporated both peer-reviewed publications (journal articles and conference proceedings) and gray literature, including unpublished dissertations, to broaden the scope of included research. A multi-method approach was employed to assess publication bias: funnel plot symmetry analysis (Light & Pillemer, 1984), where visual inspection of plot

Table 2. Coding list of original literature

First author (Date of publication)	Sample size	Subject group	Cultural back-ground	Psychological resilience measurement tool	Outcome variables	Correlation coefficient	Literature quality
Wo (2019)	698	University students	E	CD-RISC	LS & PE & NE	0.420 & 0.515 & −0.321	6
Peng (2023)	759	Secondary school students	E	RSCA	SWB	0.44	8
Zhu (2020)	487	Secondary school students	E	RSCA	SWB	0.72	7
Miao (2019)	290	Secondary school students	E	RSCA	SWB	0.63	6
Du (2024)	786	Secondary school students	E	RSCA	SWB & LS & PE & NE	0.78 & 0.60 & 0.61 & −0.58	6
Xiang (2020)	605	Secondary school students	E	RSCA	SWB	0.36	6
Ma (2023)	218	Secondary school students	E	RSCA	SWB	0.195	5
Zeng (2017)	621	Secondary school students	E	RSCA	LS & PE & NE	0.587 & 0.384 & −0.288	5
Deng (2023)	491	Secondary school students	E	RSCA	SWB	0.736	7
Wang (2020)	2141	University students	E	CD-RISC	SWB & LS	0.169 & 0.314	8
Wang (2017)	382	University students	E	ERS	SWB	0.27	4
Zhang (2024)	974	University students	E	CD-RISC	SWB	0.39	9
Li (2015)	623	University students	E	Other	LS & PE & NE	0.296 & 0.373 & −0.233	6
Tuyen (2017)	500	University students	E	RSA	SWB & LS & PE & NE	0.444 & 0.388 & 0.387 & −0.435	7
Wang (2023)	803	University students	E	CD-RISC	SWB	0.48	8
Li (2012)	1006	University students	E	ERS	SWB	0.47	8
Wang (2014)	556	University students	E	RSCA	SWB	0.05	8
Wen (2019)	983	University students	E	RTSCA	SWB	0.27	7
Chen (2020)	322	University students	E	CD-RISC	SWB & LS & PE & NE	0.701 & 0.616 & 0.610 & −0.359	8
Sun (2014)	232	University students	E	Other	SWB & LS	0.299 & 0.112	7
Guo (2023)	291	University students	E	CD-RISC	SWB	0.565	6
Nie (2014)	721	University students	E	CD-RISC	SWB	0.45	8

(Continued)

Table 2. (Continued)

First author (Date of publication)	Sample size	Subject group	Cultural back-ground	Psychological resilience measurement tool	Outcome variables	Correlation coefficient	Literature quality
Jiang (2023)	217	University students	E	CD-RISC	SWB & LS & PE & NE	0.406 & 0.345 & 0.353 & −0.127	2
Cao (2013)	625	University students	E	RSCA	SWB	0.357	2
Wo (2019)	583	University students	E	CD-RISC	SWB & LS	0.700 & 0.730	8
Guo (2011)	664	University students	E	Other	SWB	0.221	8
Liu (2020)	921	University students	E	RSCA	SWB	0.038	9
Huang (2016)	742	University students	E	CD-RISC	LS & PE & NE	0.41 & 0.22 & 0.26	7
Wang (2018)	478	University students	E	CD-RISC	SWB	0.408	8
Song (2023)	266	University students	E	CD-RISC	SWB	0.61	7
Liu et al. (2015)	448	University students	E	CD-RISC	SWB & LS	0.376 & 0.898	9
Ye et al. (2018)	418	University students	E	Other	SWB	0.43	8
Yao (2015)	994	University students	E	CD-RISC	SWB	0.38	7
Li (2023)	742	University students	E	CD-RISC	SWB	0.621	8
Yang (2012)	492	University students	E	CD-RISC	LS & PE & NE	0.324 & 0.384 & −0.125	8
Xie (2021)	430	Secondary school students	E	RSCA	SWB	0.66	6
Yang (2015)	340	Secondary school students	E	CD-RISC	SWB	0.322	9
Chen (2021)	2152	University students	E	RSCA	SWB	0.599	8
Zhu (2021)	120	University students	E	CD-RISC	SWB	0.551	8
Liang et al. (2018)	276	University students	E	CD-RISC	SWB	0.582	9
Tang (2013)	714	University students	E	Other	SWB	0.217	7
Hong (2022)	426	Secondary school students	E	CD-RISC	SWB	0.79	7
Li (2021)	473	Secondary school students	E	RSCA	SWB	0.51	8
Zhao (2014)	284	Secondary school students	E	RSCA	SWB	0.637	8
Ge (2023)	980	Secondary school students	E	CD-RISC	SWB	0.552	7
Xia (2016)	331	Secondary school students	E	CD-RISC	SWB & LS & PE & NE	0.48 & 0.29 & 0.67 & −0.15	5

(Continued)

Table 2. (Continued)

First author (Date of publication)	Sample size	Subject group	Cultural back-ground	Psychological resilience measurement tool	Outcome variables	Correlation coefficient	Literature quality
Jiang (2011)	426	Secondary school students	E	RSCA	SWB	0.645	3
Liu (2016)	416	University students	E	CD-RISC	SWB	0.422	3
Song (2015)	612	University students	E	CD-RISC	SWB	0.102	4
Hao (2022)	472	Secondary school students	E	RSCA	SWB	0.81	7
Liu (2022)	477	University students	E	CD-RISC	SWB & LS & PE & NE	0.67 & 0.61 & 0.67 & 0.28	7
Wang (2015)	346	University students	E	RSCA	SWB & LS	0.330 & 0.213	4
Wang (2019)	478	University students	E	CD-RISC	SWB & LS & PE & NE	0.61 & 0.78 & 0.71 & −0.62	8
Liu et al. (2015)	574	University students	E	CD-RISC	SWB	0.351	9
Zhang (2018)	369	University students	E	RSCA	SWB	0.289	4
Li (2021)	613	Secondary school students	E	CD-RISC	SWB	0.44	9
He (2024)	875	University students	E	CD-RISC	SWB	0.732	8
Huang (2024)	1481	University students	E	CD-RISC	SWB	0.729	4
Huang (2024)	1187	University students	E	RS	SWB	0.186	4
Hami Ti (2023)	718	University students	E	CD-RISC	SWB & LS & PE & NE	0.716 & 0.508 & 0.705 & −0.451	6
Meng (2024)	746	University students	E	BRS	SWB	0.566	8
Liu et al. (2023)	1086	University students	E	RSCA	SWB & LS & PE & NE	0.478 & 0.405 & 0.449 & −0.256	8
Zhou and Zhou (2022)	722	University students	E	BRS	LS & PE	0.357 & 0.324	7
Li (2023)	964	University students	E	CD-RISC	SWB & LS & PE & NE	0.564 & 0.333 & 0.323 & −0.334	8
Shang (2017)	640	Secondary school students	E	RSCA	LS & PE & NE	0.71 & 0.45 & −0.45	6
Liu (2017)	161	Secondary school students	E	RSCA	SWB	0.344	6
Wang (2017)	568	University students	E	CD-RISC	LS & PE & NE	0.131 & 0.158 & −0.140	6
Han (2016)	879	University students	E	RSCA	SWB	0.441	9

(Continued)

Table 2. (Continued)

First author (Date of publication)	Sample size	Subject group	Cultural back-ground	Psychological resilience measurement tool	Outcome variables	Correlation coefficient	Literature quality
Jiang (2020a)	403	University students	E	RSCA	SWB	0.001	6
Jiang (2020b)	402	University students	E	RSCA	SWB	0.458	6
Cao (2014)	467	University students	E	RTSCA	SWB & LS & PE & NE	0.480 & 0.450 & 0.456 & −0.469	8
Zhou (2020)	742	University students	E	CD-RISC	SWB	0.342	8
Wu (2018)	1260	University students	E	RSCA	SWB	0.366	8
Zhang (2024)	337	University students	E	CD-RISC	SWB	0.396	8
Wang (2022)	444	University students	E	CD-RISC	SWB	0.736	8
Song (2023)	664	University students	E	RSCA	SWB	0.701	6
Zhang (2020)	1452	University students	E	CD-RISC	SWB	0.36	3
Chen (2023)	2043	Secondary school students	E	RSCA	LS	0.768	8
Shi (2021)	598	Secondary school students	E	CD-RISC	SWB	0.866	8
Cheng (2023)	811	Secondary school students	E	RSCA	SWB	0.211	7
Yang (2023)	270	Secondary school students	E	RSCA	LS	0.72	6
Wang (2021)	996	Secondary school students	E	RSCA	SWB	0.715	7
Wang (2016)	280	Secondary school students	E	RSCA	SWB	0.575	8
Yin (2023)	304	University students	E	CD-RISC	SWB	0.564	9
Rodríguez-Fernández (2016)	1250	Secondary school students	W	CD-RISC	LS & PE & NE	0.50 & 0.53 & 0.17	5
Eldeleklioğlu and Yıldız (2020)	217	University students	E	RSA	SWB	0.94	6
Orines (2023)	213	University students	E	CD-RISC	SWB	0.23	6
Kong et al. (2021)	1445	Secondary school students	E	CD-RISC	SWB	0.23	8
Bajaj (2016)	327	University students	E	CD-RISC	LS & PE & NE	0.29 & 0.44 & −0.29	4
Zubair (2018)	496	University students	W	ERS	SWB	0.52	6
Bajaj (2016)	589	University students	E	CD-RISC	LS & PE & NE	0.29 & 0.44 & −0.29	8
Hao (2024)	947	University students	E	RTSCA	SWB	0.553	8
Xiang (2024)	213	University students	E	CD-RISC	SWB	0.6	7

(Continued)

Table 2. (Continued)

First author (Date of publication)	Sample size	Subject group	Cultural back-ground	Psychological resilience measurement tool	Outcome variables	Correlation coefficient	Literature quality
Chuning (2024a)	236	University students	W	CD-RISC	SWB	0.71	8
Chuning (2024b)	196	University students	W	CD-RISC	SWB	0.71	8
Satici (2016)	332	University students	W	BRS	LS & PE & NE	0.19 & 0.31 & −0.34	8
Shek (2018)	3328	Secondary school students	E	Other	LS	0.315	8
Víllora (2020)	1430	University students	W	Other	SWB	0.592	8
Wu (2022)	550	University students	E	CD-RISC	SWB	0.501	10
Su (2023)	3349	University students	E	CD-RISC	SWB	0.456	10
Liu (2013)	263	University students	E	CD-RISC	LS	0.2	7
Lu (2014)	289	University students	E	CD-RISC	SWB & PE & NE	0.5 & 0.52 & −0.12	8
Etherton et al. (2022)	141	University students	W	CD-RISC	LS	0.36	8
Miranda and Cruz (2022)	300	University students	E	CD-RISC	LS & PE & NE	0.39 & 0.50 & −0.22	7
An et al. (2023)	443	Secondary school students	E	CD-RISC	SWB & LS	0.46 & 0.53	8
Yu (2024)	1537	Secondary school students	E	Other	LS	0.65	10
Yıldırım (2021)	202	University students	W	BRS	LS	0.43	6
Asanjarani et al. (2023)	629	Secondary school students	E	CD-RISC	SWB	0.444	8
Zhao (2016a)	426	University students	E	RS	SWB	0.293	10
Zhao (2016b)	336	University students	E	RS	SWB	0.413	10
Ma, 2023	331	University students	E	CD-RISC	SWB	0.36	8
Wan et al. (2023)	683	University students	E	CD-RISC	SWB	0.373	10
Sorrenti et al. (2022)	1094	University students	W	RS	SWB	0.67	6
Chen (2016)	239	University students	E	CD-RISC	LS & PE & NE	0.41 & 0.54 & −0.33	10

(Continued)

Table 2. Coding list of original literature

First author (Date of publication)	Sample size	Subject group	Cultural background	Psychological resilience measurement tool	Outcome variables	Correlation coefficient	Literature quality
Meng (2024)	1099	Secondary school students	E	CD-RISC	LS & PE & NE	0.179 & 0.172 & −0.066	6

Note. To conserve space, references are cited by first author and publication year. The adolescent cohort encompasses junior high, senior high, and vocational high school students, while university populations include undergraduates, postgraduates, and higher vocational college students. Cultural contexts are dichotomously coded (E = Eastern, W = Western). Resilience measurement instruments comprise: the Connor-Davidson Resilience Scale (CD-RISC; Chinese adaptation measuring tenacity, strength, optimism), Resilience Scale for Chinese Adolescents (RSCA), Resilience Scale for Adults (RSA; personal competence, social competence, structured style, family cohesion, social resources), Resilience Trait Scale for Chinese Adults (RTSCA), Resilience Scale (RS; equanimity, perseverance, self-reliance, meaningfulness, existential aloneness), Brief Resilience Scale (BRS), Ego-Resilience Scale (ERS), and supplementary instruments including the Asian Resilience Scale, Resiliency Scale of University Students, Chinese Positive Youth Development Scale, Mental Toughness Inventory (MTI), and Scale of Protective Factors-24 (SPF-24). Subjective Well-Being (SWB) is operationalized as a tripartite construct incorporating Life Satisfaction (LS), Positive Emotions (PE), and Negative Emotions (NE). Multiple independent samples within single studies are differentiated through alphabetical suffixes appended to publication years (e.g., 2020a, 2020b).

asymmetry provides preliminary evidence of bias; the fail-safe N coefficient (Rosenthal, 1995), which quantifies the number of additional null studies required to overturn the observed effect (with a threshold of $5k + 10$, where k represents the number of included studies); Egger's regression test (Egger et al., 1997), where a non-significant intercept ($p > 0.05$) indicates minimal bias; and the trim-and-fill method (Liu et al., 2023), an iterative algorithm that estimates the potential impact of missing studies by imputing hypothetical effect sizes and recalculating adjusted estimates. These complementary techniques collectively evaluate the robustness of the meta-analytic conclusions against publication bias.

Model selection

The choice between fixed-effect and random-effects models hinges on assumptions about the underlying distribution of effect sizes. The fixed-effect model presumes homogeneity across studies, attributing observed variations solely to sampling error, while the random-effects model acknowledges heterogeneity in true effect sizes due to systematic differences in study characteristics such as participant selection and measurement tools (Schmidt et al., 2009). Given the substantial variability in measurement instruments (e.g., CD-RISC, RSA) and demographic characteristics (e.g., cultural backgrounds, educational stages) observed across the included studies, the random-effects model was selected to account for both within-study and between-study variance, thereby providing more conservative and generalizable estimates of the population effect size.

Heterogeneity testing

Heterogeneity testing was conducted to determine the suitability of the chosen analytic model. Two primary metrics were utilized: the Q-statistic, which evaluates total variance across studies under a chi-square distribution (with $p < 0.05$ indicating significant heterogeneity), and the I^2 index, quantifying the proportion of true heterogeneity relative to total observed variance, classified as low (25%), moderate (50%), or high (75%) (Higgins et al., 2002). These analyses not only informed model selection but also guided the interpretation of variability in effect sizes. Consistent with contemporary meta-analytic practices, the random-effects model was retained regardless of heterogeneity levels to ensure methodological rigor and accommodate potential unobserved moderators.

Data processing

Analyses were performed using Comprehensive Meta-Analysis Version 3.0 software. The primary analysis computed weighted mean effect sizes (Pearson's r) under the random-effects framework. Moderator analyses were conducted through subgroup analyses for categorical variables (cultural context, resilience measurement instruments, population type). Statistical significance was assessed using maximum likelihood estimation with Knapp-Hartung adjustments to mitigate type I error inflation. Three moderators were systematically evaluated: cultural background (Eastern/Western), resilience measurement tools (e.g., CD-RISC, RSA) and population characteristics (adolescents vs. university students).

This integrated methodological framework adheres to PRISMA guidelines while preserving the original study's theoretical intent, ensuring both statistical robustness and clinical interpretability. Full reproducibility is facilitated through transparent reporting of analytic decisions and effect size conversion protocols (Peterson & Brown, 2005).

Results

Heterogeneity analysis

A heterogeneity test was conducted on the included effect sizes to validate the use of a random-effects model. As summarized in Table 3, the Q statistics for psychological

Table 3. Results of heterogeneity test

Outcome variables	*k*	*p*	I^2
Subjective well-being	93	0.000	97.912
Life satisfaction	39	0.000	98.218
Positive emotions	27	0.000	95.903
Negative emotions	26	0.000	97.540

Note. *k* represents the number of independent effect sizes, as follows.

resilience and its associations with subjective well-being, life satisfaction, positive emotions, and negative emotions were 4406.274, 2132.129, 634.646, and 1016.136, respectively. All Q values reached statistical significance ($p < 0.001$), confirming substantial heterogeneity among effect sizes. Furthermore, the I^2 values for these associations exceeded 75% (97.912, 98.218, 95.903, and 97.540), indicating exceptionally high heterogeneity according to conventional benchmarks (Higgins et al., 2002). These I^2 values signify that over 95% of the observed variance in effect sizes reflects genuine differences in study-level effects rather than sampling error. These findings necessitated the adoption of a random-effects model for analysis. The observed heterogeneity suggests that variations in effect estimates across studies may arise from methodological or contextual factors beyond those examined in the current moderator analyses, underscoring the presence of substantial unexplained variance and cautioning against over-interpretation of the pooled effect sizes. Complete heterogeneity statistics (Q, df, T^2) are presented in Supplementary Table S1.

Publication bias evaluation

Publication bias was assessed through four methods: funnel plots, the fail-safe N statistic, Egger's regression, and the Trim and Fill method (Figures 2–5; Table 4). First, funnel plot symmetry for all examined relationships—psychological resilience with subjective well-being and its components—suggested minimal publication bias, as effect sizes clustered evenly around the mean. Second, the fail-safe N values for these associations (10,858; 5312; 5718; 6082) substantially exceeded the critical threshold of $5k + 10$ (k = number of studies), further supporting the robustness of the findings. Third, non-significant Egger's regression results ($p = 0.193$, 0.934, 0.291, 0.348) provided additional evidence against publication bias. Finally, Trim and Fill adjustments revealed no meaningful changes in overall effect magnitudes. Collectively, these analyses confirm that publication bias is unlikely to distort the reported relationships.

Main effects analysis

The results of the main effects analysis examining the relationship between psychological resilience and subjective well-being (SWB), including its three components, are presented in Table 5. According to the criteria proposed by Cohen (1988), correlation coefficients (r) are interpreted as follows: negligible ($r = 0.00$–0.09), weak ($r = 0.10$–0.29), moderate ($r = 0.30$–0.49), and strong ($r = 0.50$–1.00). The results indicate a statistically significant strong positive correlation between psychological resilience and overall SWB ($r = 0.508$, $p < 0.001$). Moderate correlations were observed between psychological resilience and life satisfaction ($r = 0.470$, $p < 0.001$) as well as positive emotions ($r = 0.465$,

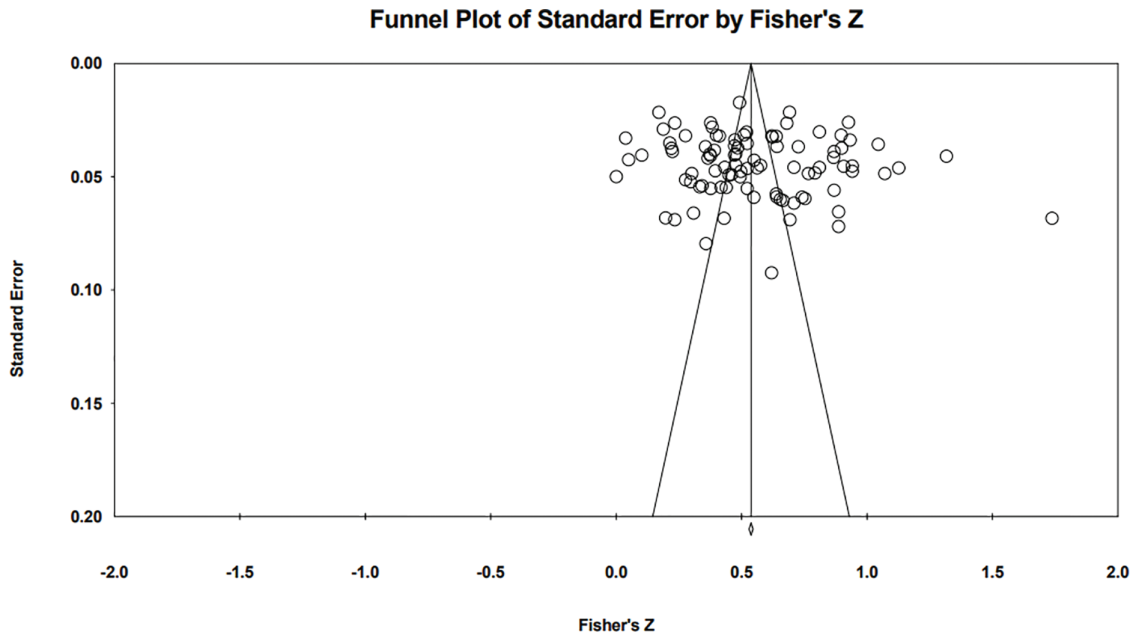

Figure 2. Funnel plot of the distribution of the relationship between psychological resilience and subjective well-being

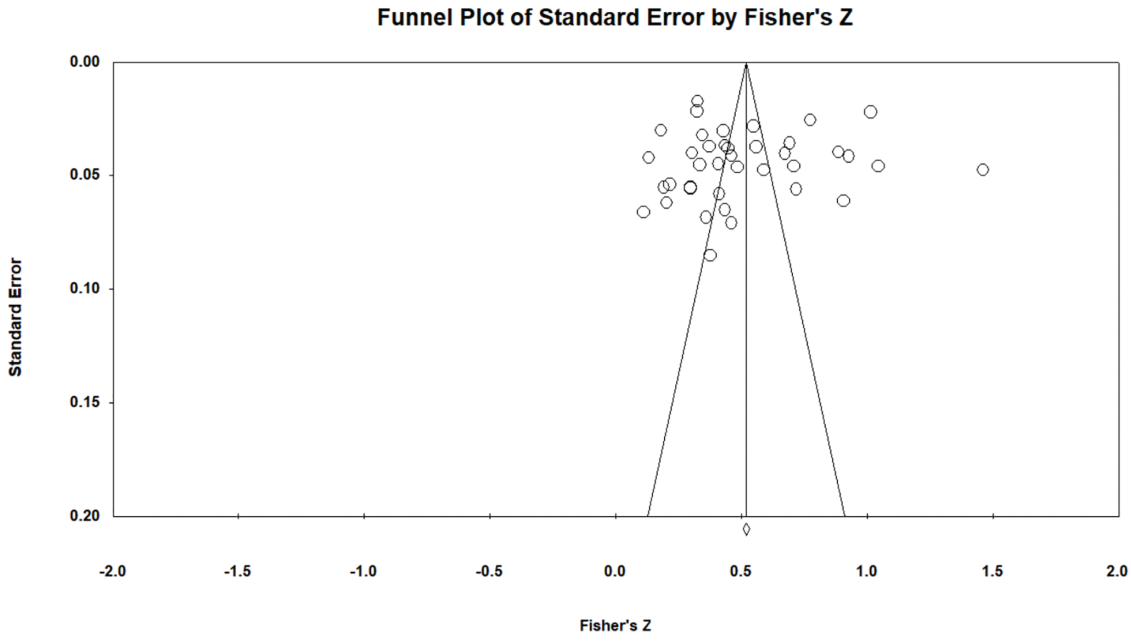

Figure 3. Funnel plot of the distribution of the relationship between psychological resilience and life satisfaction

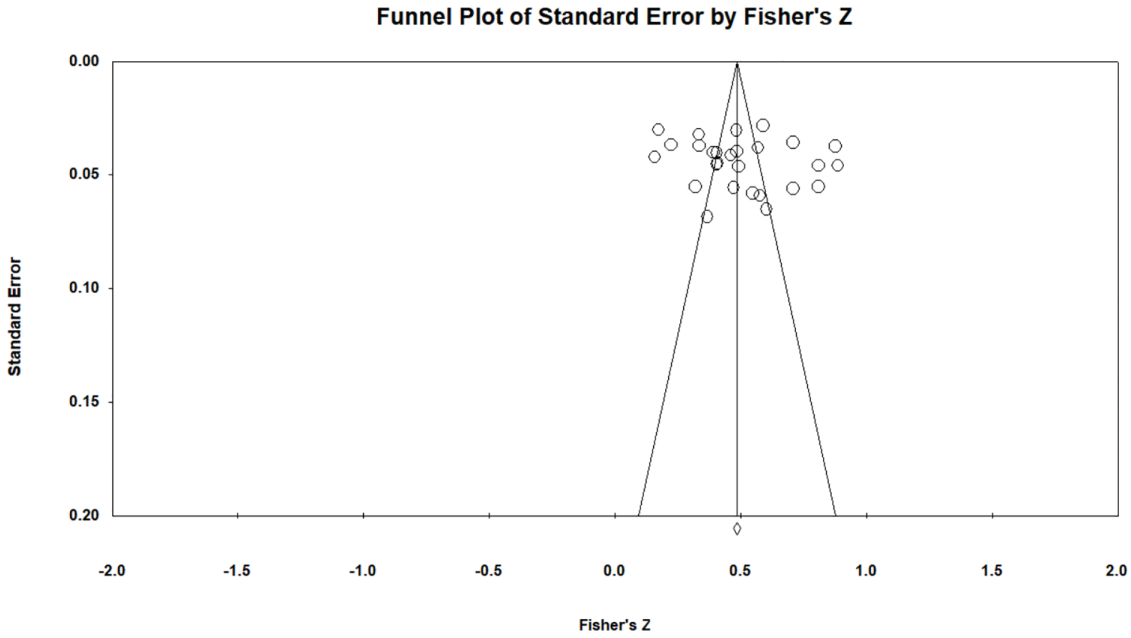

Figure 4. Funnel plot of the distribution of the relationship between psychological resilience and positive emotions

$p < 0.001$). In contrast, psychological resilience showed a weak but significant negative correlation with negative emotions ($r = -0.253$, $p < 0.001$). These findings collectively demonstrate that psychological resilience is robustly associated with subjective well-being and its constituent dimensions, with varying magnitudes of correlation across components.

Moderator analyses

The heterogeneity test results revealed substantial heterogeneity among the included studies, necessitating further exploration of potential moderating factors. Subgroup analyses were conducted for categorical moderators (cultural background, psychological resilience measurement instruments, and adolescent participant groups; Tables 6–8). Comprehensive results for all moderators, including full heterogeneity statistics and subgroup details, are provided in Supplementary Tables S3–S5.

Cultural Background (Table 6). Cultural background significantly moderated the relationship between psychological resilience and subjective well-being ($Q_B = 11.905$, $p < 0.01$). Specifically, the correlation coefficient was stronger in Western contexts ($r = 0.641$, $p < 0.001$) compared to Eastern contexts ($r = 0.499$, $p < 0.001$). No moderating effects were observed for life satisfaction ($Q_B = 1.424$, $p > 0.05$), positive emotions ($Q_B = 0.113$, $p > 0.05$), or negative emotions ($Q_B = 0.473$, $p > 0.05$).

Measurement Instruments (Table 7). Psychological resilience measurement tools significantly moderated the associations with positive emotions ($Q_B = 17.202$,

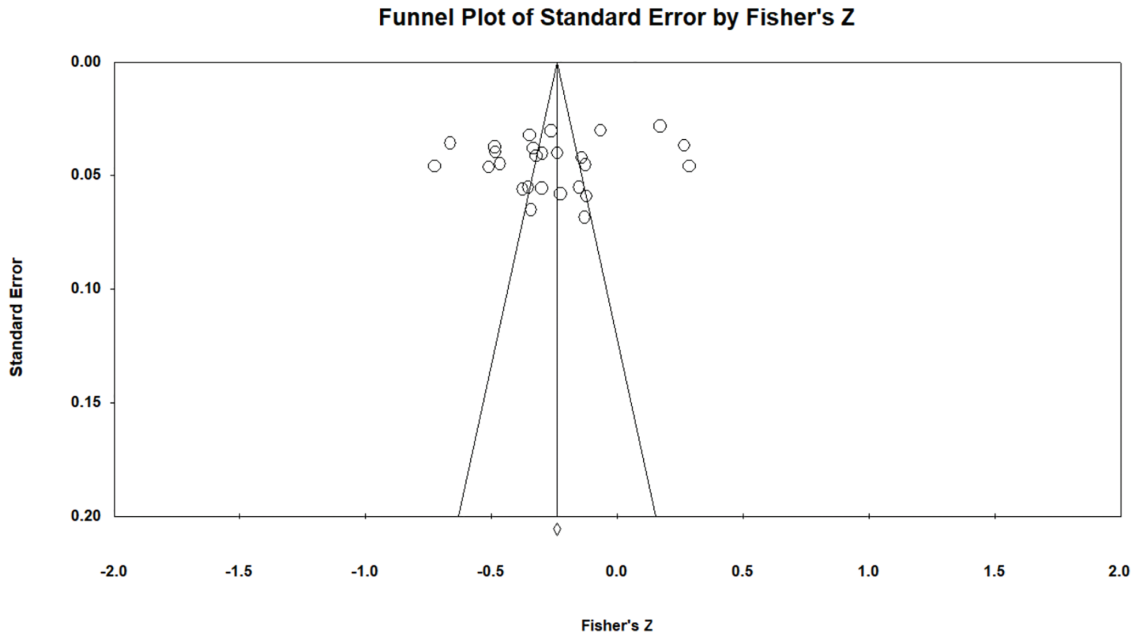

Figure 5. Funnel plot of the distribution of the relationship between psychological resilience and negative affectivity

Table 4. Results of publication bias test

Outcome variables	*k*	Classic fail-safe *N*	Egger's intercept	*SE*	95% CI		*p*	Trill and fill
					LL	UL		
Subjective well-being	93	10,858	3.015	2.301	−1.556	7.585	0.193	[0.508, 0.563]
Life satisfaction	39	5312	−0.280	3.384	−7.137	6.576	0.934	[0.470, 0.523]
Positive emotions	27	5718	4.517	4.192	−4.116	13.150	0.291	[0.465, 0.475]
Negative emotions	26	6082	−5.212	5.448	−16.456	6.032	0.348	[−0.253, −0.168]

Table 5. Main effects test results

Outcome Variables	*k*	*r*	95% CI		*p*
			LL	UL	
Subjective well-being	93	0.508	0.466	0.548	0.000
Life satisfaction	39	0.470	0.397	0.537	0.000
Positive emotions	27	0.465	0.402	0.523	0.000
Negative emotions	26	−0.253	−0.346	−0.155	0.000

Note. A detailed version of this table, including *z*-values and full confidence interval bounds, is available in Supplementary Table S2.

Table 6. Moderating effect test results of cultural background

Moderating variable	Outcome variable	Category	*k*	*N*	*r*	95% CI	
						LL	UL
Cultural background	Subjective well-being	E	88	57,540	0.499	0.455	0.541
		W	5	3452	0.641	0.575	0.699
	Life satisfaction	E	35	25,640	0.480	0.402	0.552
		W	4	1925	0.377	0.211	0.523
	Positive emotions	E	25	14,295	0.468	0.400	0.530
		W	2	1582	0.430	0.193	0.619
	Negative emotions	E	24	13,573	−0.267	−0.356	−0.172
		W	2	1582	−0.089	−0.540	0.402

Note. *N* stands for sample size, same below.

Table 7. Results of the moderated effects test of the psychological elasticity measurement instrument

Moderating variable	Outcome variable	Category	*k*	*N*	*r*	95% CI	
						LL	UL
Psychological resilience measurement tools	Subjective well-being	BRS	1	746	0.566	0.515	0.613
		CD-RISC	47	31,115	0.526	0.470	0.578
		ERS	3	1884	0.428	0.293	0.546
		RS	4	3043	0.410	0.107	0.643
		RSA	2	717	0.803	−0.128	0.982
		RSCA	28	17,632	0.499	0.410	0.579
		RTSCA	3	2397	0.441	0.244	0.603
		Other	5	3458	0.363	0.162	0.534
	Life satisfaction	BRS	3	1256	0.326	0.196	0.445
		CD-RISC	23	13,830	0.466	0.370	0.553
		RSA	1	500	0.388	0.311	0.460
		RSCA	7	5792	0.598	0.443	0.718
		RTSCA	1	467	0.450	0.375	0.520
		Other	4	5720	0.365	0.110	0.575
	Positive emotions	BRS	2	1054	0.320	0.264	0.373
		CD-RISC	18	10,100	0.487	0.395	0.568
		RSA	1	500	0.387	0.310	0.459
		RSCA	4	3133	0.478	0.375	0.570
		RTSCA	1	467	0.456	0.381	0.525
		Other	1	623	0.373	0.303	0.439
	Negative emotions	BRS	1	332	−0.340	−0.432	−0.241
		CD-RISC	18	10,100	−0.189	−0.309	−0.064
		RSA	1	500	−0.435	−0.503	−0.361
		RSCA	4	3133	−0.402	−0.548	−0.233
		RTSCA	1	467	−0.469	−0.537	−0.395
		Other	1	623	−0.233	−0.306	−0.157

Table 8. Moderating effect test results for the subject group

Moderating variable	Outcome variable	Category	*k*	*N*	*r*	95% CI	
						LL	UL
Subject group	Subjective well-being	University students	68	47,218	0.482	0.434	0.526
		Secondary school students	25	13,774	0.575	0.484	0.653
	Life satisfaction	University students	28	15,217	0.434	0.349	0.511
		Secondary school students	11	12,348	0.556	0.420	0.667
	Positive emotions	University students	21	11,150	0.459	0.388	0.526
		Secondary school students	6	4727	0.483	0.331	0.611
	Negative emotions	University students	20	10,428	−0.256	−0.354	−0.153
		Secondary school students	6	4727	−0.243	−0.472	0.017

$p < 0.01$) and negative emotions ($Q_B = 32.329$, $p < 0.001$). The Connor-Davidson Resilience Scale (CD-RISC) demonstrated the strongest correlation between psychological resilience and positive emotions ($r = 0.487$, $p < 0.001$), surpassing results from the Brief Resilience Scale (BRS) and Resilience Scale for Chinese Adolescents (RSCA). Conversely, the Resilience Trait Scale for Chinese Adolescents (RTSCA) exhibited the strongest inverse correlation with negative emotions ($r = -0.409$, $p < 0.001$), outperforming BRS and CD-RISC. No moderation was detected for subjective well-being ($Q_B = 11.110$, $p > 0.05$) or life satisfaction ($Q_B = 9.693$, $p > 0.05$).

Participant Groups (Table 8). Participant type (e.g., age, educational stage) did not moderate the relationships between psychological resilience and subjective well-being ($Q_B = 3.321$, $p > 0.05$), life satisfaction ($Q_B = 2.404$, $p > 0.05$), positive emotions ($Q_B = 0.087$, $p > 0.05$), or negative emotions ($Q_B = 0.010$, $p > 0.05$).

Discussion

The relationship between psychological resilience and subjective well-being

A systematic review of 112 domestic and international studies was conducted to investigate the internal mechanisms through which psychological resilience influences is associated with subjective well-being (SWB) and its three components, along with potential moderating variables affecting these relationships. The results revealed significant associations between psychological resilience and all SWB dimensions in adolescents: strong positive correlations with overall SWB ($r = 0.508$, $p < 0.001$), moderate correlations with life satisfaction ($r = 0.470$, $p < 0.001$) and positive emotions ($r = 0.465$, $p < 0.001$), and a weak negative correlation with negative emotions ($r = -0.253$, $p < 0.001$), consistent with prior findings (Asanjarani et al., 2023; Satici, 2016), thereby confirming Hypothesis 1. From an emotional regulation perspective, resilience is linked to enhanced stress management capabilities, associated with reduced negative emotional responses while amplified positive affective experiences (Etherton et al., 2022; Kong et al., 2021). Individuals with higher resilience demonstrate emotional stability during adversity, which may mitigate the detrimental impact of emotional volatility on SWB (Chuning et al., 2024; Huang et al., 2016). Cognitively, resilience is associated with adaptive appraisal patterns that may enhance SWB. Optimistic cognitive reappraisal of life events is facilitated by associated with resilience, and may promote life satisfaction and well-being (Jiang & Chen, 2020; Liu et al., 2015). Intrinsic psychological mechanisms of resilience involve the accumulation of psychological resources, which may sustain positivity during adversity and stress (Zhou & Zhou, 2022). Resilience is associated with enhanced adaptive capacity, which may facilitate effective responses to life challenges and transitions (Ye et al., 2018). Higher resilience is associated with greater psychological resources, and the maintenance of positive affect during difficulties (Liang et al., 2018). The stress-buffering model posits that resilience may reduce stress-induced emotional distress through proactive coping strategies (Miranda & Cruz, 2022). For instance, under sleep deprivation or academic stress, highly resilient individuals tend to reframe challenges as growth opportunities rather than threats, which is associated with reduced negative affect and heightened positive emotional experiences (An et al., 2023). Neurobiological evidence has linked resilience to optimized dopaminergic functioning, which may enhance reward sensitivity and positive emotional processing (An et al., 2023). Experience-sampling studies demonstrate that high-resilience university students exhibit more frequent and intense positive emotions, often expressed through overt affective displays that reinforce well-being; conversely, low-resilience individuals engage in maladaptive cognitive rumination, exacerbating negative emotional states (Lv et al., 2017).

These findings support specific, actionable steps for enhancing adolescent well-being. In schools, this includes implementing resilience training programs that teach cognitive reappraisal and emotion regulation skills. For practitioners, integrating brief resilience assessments into well-being screenings can help identify at-risk youth for targeted counseling. At a broader level, embedding resilience-building principles into curricula and teacher training can serve as a universal prevention strategy.

Moderating factors affecting the relationship between psychological resilience and subjective well-being

The moderating effect of cultural type

Meta-analytic results indicated that cultural background significantly moderated the relationship between psychological resilience and subjective well-being (SWB), partially validating Hypothesis 2. Specifically, the correlation coefficient between psychological resilience and SWB was significantly higher in Western cultural contexts than in Eastern contexts. This divergence may stem from culturally embedded value orientations. A cross-national survey across 19 countries demonstrated stronger associations between hedonic pursuits and well-being in individualistic cultures (Joshanloo & Jarden, 2016). Western cultures, emphasizing individualism and personal autonomy (Cohen et al., 2016), may promote resilience through self-regulation and self-efficacy, thereby amplifying resilience's positive association with SWB (Krys et al., 2019). In contrast, Eastern cultures prioritize collectivism and relational harmony, where resilience is shaped not only by intrapersonal factors but also by external systems—social support (Huang et al., 2016), familial bonds (Masten & Motti-Stefanidi, 2020), and community cohesion (Hall & Zautra, 2010)—as theorized in ecological resilience frameworks (Ungar, 2008). Within these cultural contexts, the mechanisms linking resilience to SWB enhancement are comparatively multifaceted. Furthermore, Western studies frequently employ scales incorporating dimensions such as "spiritual faith" or "perceived control" (e.g., CD-RISC), which align more closely with individualistic conceptualizations of resilience, potentially amplifying observed resilience-SWB associations. However, cultural background did not significantly moderate life satisfaction, positive affect, or negative affect, likely because affective components (positive/negative emotions) and cognitive components (life satisfaction) of SWB operate through distinct pathways (Campbell, 1976; Garcia et al., 2017; Lazić et al., 2021). Cultural influences may thus manifest more prominently in global SWB evaluations rather than specific subcomponents.

The moderating effect of psychological resilience measurement tools

Meta-analytic results revealed that psychological resilience measurement instruments significantly moderated the relationships between resilience and both positive and negative affect. This heterogeneity underscores the conceptual and operational diversity inherent in resilience assessment, as detailed in Table 1.

Notably, resilience measured by the Connor-Davidson Resilience Scale (CD-RISC) demonstrated significantly stronger correlations with positive affect compared to other instruments, whereas the Resilience Trait Scale for Chinese Adolescents (RTSCA) showed stronger inverse

correlations with negative affect. These differential associations can be understood by examining the core dimensions emphasized by each scale (see Table 1).

The CD-RISC's stronger linkage with positive affect aligns with its comprehensive focus on positive adaptive traits, including personal competence, tenacity, and optimism (Connor & Davidson, 2003). Conversely, the RTSCA's pronounced role in negative affect regulation corresponds to its conceptual grounding in stress-coping mechanisms, internal locus of control, and problem-solving orientation (Liang & Cheng, 2012). These instrument-specific conceptual foci provide a compelling explanation for the observed differential associations with SWB components.

Beyond conceptual differences, methodological characteristics of the instruments also contribute to the observed heterogeneity. Variations in instrument reliability and validity may systematically influence observed resilience-SWB relationships, as instruments with superior psychometric properties more accurately capture the true construct (Lau, 2022). The tabular overview (Table 1) illustrates the multidimensional nature of resilience, explaining why scales with differing dimensional emphases (e.g., the RSA's focus on social resources vs. the RS's emphasis on existential meaningfulness) demonstrate varying predictive validity for specific well-being components. The Brief Resilience Scale (BRS), while practical for large-scale surveys due to its brevity, has limited capacity to assess the full spectrum of this complex construct (Smith et al., 2008).

A critical methodological consideration is the stability of these moderator findings. It must be noted that estimates for certain scales were derived from a limited number of studies (e.g., $k = 2$ for the Resilience Scale for Adults, RSA). While these results contribute to the pattern of measurement heterogeneity, their precision is limited, and they should be interpreted as preliminary evidence requiring confirmation through future research with larger samples.

The moderating role of participant groups

Subgroup analyses indicated no significant moderating effect of participant group on the resilience-SWB association, contradicting Hypothesis 4. Despite greater social experience among older adolescents, no significant differences in resilience-SWB correlation strength were observed between groups. This null finding may reflect developmental continuity during adolescence, as both middle school and university students occupy critical periods of identity formation, face comparable academic-social stressors, and exhibit minimal age-related divergence. Methodological convergence in measurement instruments and study designs across groups may have attenuated observable differences, thus limiting divergence in association magnitudes. Future investigations should stratify adolescent subgroups (e.g., junior high, senior high, vocational students) to examine stage-specific mechanisms linking resilience to SWB.

Limitations and future directions

Several limitations should be acknowledged. First, the predominantly cross-sectional nature of included studies precludes causal inferences about the resilience-SWB relationship. Future research should employ longitudinal or experimental designs to establish temporal precedence and causality.

Second, the dichotomous East-West cultural classification may overlook important within-culture variations and sociopolitical differences. Future research should incorporate more nuanced cultural indicators such as individualism-collectivism dimensions.

Third, while measurement heterogeneity for resilience constructs was identified as a significant moderator, a parallel concern involves the operationalization and measurement of subjective well-being. The construct of SWB was measured using various instruments across studies, with differing emphases on its cognitive (life satisfaction) and affective (positive and negative affect) components, as well as the use of composite scores vs. separate dimensions. This methodological heterogeneity may contribute to variance in the observed effects, and future meta-analyses would benefit from conducting sensitivity analyses based on SWB measurement instruments.

Fourth, the high heterogeneity ($I^2 > 95\%$), while addressed through moderator analyses, remains largely unexplained and may affect the precision of aggregate estimates. The exceptionally high heterogeneity suggests that the pooled correlation should be interpreted as a summary of a highly diverse literature rather than a precise estimate of a single, stable population parameter, which consequently lowers the confidence in the accuracy of the aggregate effect size. Future work should explore additional moderators (e.g., socioeconomic status, specific life stressors) to account for this variance.

Fifth, reliance on self-report measures introduces potential common method variance. Future research should incorporate objective or multi-informant measures of well-being.

Sixth, and relatedly, there is potential conceptual and operational overlap between measures of psychological resilience and subjective well-being. Some dimensions of resilience scales (e.g., optimism, emotional regulation) may conceptually overlap with components of well-being scales (e.g., positive affect, life satisfaction). This shared methodological variance might inflate the observed correlations beyond the true underlying relationship between the distinct constructs.

Seventh, as noted in the discussion of moderator effects, several subgroup analyses were conducted with a limited number of studies, particularly for specific resilience measurement instruments (e.g., RSA, RTSCA) and Western cultural samples. The effect size estimates for these subgroups, while informative, may lack stability and require replication in future meta-analyses with a broader evidence base.

Notwithstanding these limitations, the findings have clear practical implications. Evidence-based resilience programs such as the Penn Resilience Program (PRP) and the Resilience Doughnut model, which incorporate cognitive-behavioral techniques, emotion regulation skills,

and social support building, are strongly recommended for implementation in school settings. The cultural differences identified suggest that interventions should be adapted, with Western approaches emphasizing individual strengths and Eastern approaches incorporating familial and community resources. The growing association between resilience and well-being over time, potentially amplified by contemporary challenges such as the COVID-19 pandemic and increased digitalization, underscores the urgent relevance of embedding these resilience-focused interventions in educational and mental health frameworks.

Conclusion

This meta-analysis provides the first large-scale synthesis specifically examining the relationship between psychological resilience and subjective well-being in adolescent populations while comprehensively investigating cultural, methodological, and developmental moderators. The results revealed significant correlations between psychological resilience and SWB across its core components—life satisfaction, positive affect, and negative affect. Critically, cultural context and measurement instruments were identified as significant moderators of these associations, providing crucial insights into the boundary conditions of the resilience-SWB relationship.

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Availability of Data and Materials: The data will be provided upon request to the corresponding author.

Ethics Approval: Not applicable.

Conflicts of Interest: The authors declare no conflicts of interest to report regarding the present study.

Registration and Protocol: The systematic review protocol was registered with the International Prospective Register of Systematic Reviews (PROSPERO) (registration number: CRD420251161399). The full protocol can be accessed at: https://www.crd.york.ac.uk/PROSPERO/view/CRD420251161399 (accessed on 01 January 2025). No amendments were made to the information provided at registration.

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