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Psychological, social, and human capital and career empowerment among women entrepreneurs: A meta-analytic structural equation modeling approach

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Abstract: This study integrates fragmented evidence to examine how psychological, social, and human capital jointly influence career empowerment among women entrepreneurs, with work engagement as a mediator and the level of economic development as a key contingency. A meta-analytic structural equation modelling (MASEM) approach was employed to synthesise 49 quantitative studies (N = 31,247 women entrepreneurs, 2015–2025) identified through Web of Science and Scopus using PRISMA 2020 guidelines. Psychological, social, and human capital each exert significant direct and indirect effects on career empowerment through work engagement (partial mediation). Psychological capital shows the strongest total effect, with over half mediated by engagement. The entire process is significantly stronger in developing economies (pooled $\beta = 0.276$) than in developed economies (pooled $\beta = 0.184$). Work engagement serves as a core motivational mechanism converting capital into empowerment, but its strength is highly context-dependent, with markedly greater impact under institutional constraints. Policymakers and incubators in emerging markets, especially China, should prioritise scalable psychological capital training and engagement-enhancing peer networks to maximise women's entrepreneurial empowerment.

Keywords: *Career empowerment, Emerging economies, Meta-analytic SEM, Psychological capital, Women entrepreneurs Work engagement.*

1. Introduction

Women entrepreneurs represent one of the fastest-growing entrepreneurial segments globally, yet they continue to experience lower levels of career control, psychological ownership, and long-term persistence compared to men [1-3]. In China, women founded approximately 55% of new internet ventures between 2015 and 2023, propelled by national mass entrepreneurship policies [4]. Despite this surge, Chinese women entrepreneurs consistently report significantly lower perceived career empowerment than their male counterparts [5-7]. Identifying the mechanisms that convert personal and relational resources into sustained career empowerment is therefore both theoretically critical and socially imperative.

Three theoretically distinct yet interrelated forms of capital have emerged as core antecedents of entrepreneurial success: human capital (education, experience, and skills), social capital (networks and relational resources), and psychological capital (self-efficacy, hope, optimism, and resilience) [8]. Drawing on resource-based theory and the Job Demands-Resources (JD-R) model, recent studies suggest that these capitals do not directly translate into outcomes but operate primarily through

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motivational processes [9-11]. Among these, work engagement, a positive, fulfilling, work-related state of mind characterized by vigor, dedication, and absorption, stands out as a pivotal mediator that channels resources into performance, persistence, and subjective empowerment [12, 13].

Although the number of primary studies examining fragments of this "capital → engagement → empowerment" pathway among women entrepreneurs has grown rapidly, particularly in emerging Asian economies, results remain fragmented, sometimes contradictory, and limited by small samples and inconsistent measurement [14, 15]. Moreover, no study to date has simultaneously modeled all three forms of capital with work engagement as a common mediator, nor has it systematically examined whether effect sizes differ between emerging and developed economies, an omission that hinders contextualized theory building [16-18].

The present study addresses these gaps using meta-analytic structural equation modeling (MASEM). Integrating 56 independent samples comprising more than 31,000 women entrepreneurs published between 2015 and 2025, we pose three interrelated research questions:

To what extent do psychological, social, and human capital individually and collectively influence career empowerment among women entrepreneurs through work engagement?

Does work engagement mediate the relationships between psychological, social, and human capital and career empowerment?

Do these relationships exhibit culture-specific patterns, particularly when comparing samples from emerging versus developed economies?

By providing the first integrative test of the capital, engagement, and empowerment model exclusively among women entrepreneurs, this study makes three principal contributions. First, it establishes the relative strength and mediated pathways of three major forms of capital within a single structural framework. Second, it clarifies the central motivational role of work engagement in women's entrepreneurship, bridging JD-R theory with resource-based perspectives. Third, and most importantly, by revealing significantly stronger effects in emerging economies (especially China and other Asian contexts), it advances contextualized entrepreneurship theory and offers precise, evidence-based implications for policymakers and support agencies aiming to enhance women's entrepreneurial empowerment in institutionally challenging environments.

The remainder of this paper is organized as follows. We first develop the theoretical model and hypotheses. We then describe the meta-analytic methodology, present results from both conventional meta-analysis and two-stage MASEM, and conclude with theoretical contributions, practical implications, limitations, and directions for future research.

2. Literature Review

2.1. Career Empowerment among Women Entrepreneurs

Career empowerment captures the extent to which women entrepreneurs experience psychological ownership, autonomy, competence, and impact over their entrepreneurial careers [19-21]. Unlike objective performance indicators (e.g., revenue, survival), career empowerment emphasizes subjective meaning-making and long-term persistence, outcomes particularly salient for women who face persistent gender-based liabilities in legitimacy, financing, and institutional support [22]. Meta-analytic and cross-national evidence confirms that women entrepreneurs exhibit lower levels of perceived empowerment than men, with the gap being especially pronounced in emerging economies[22].

2.2. The Capital-Based Perspective in Women's Entrepreneurship

Resource-based theory (RBV) and its entrepreneurial extensions posit that sustained competitive advantage and psychological success arise from valuable, rare, and inimitable resources [23]. Three forms of capital have received the most attention:

Human capital (education, entrepreneurial experience, skills, and training) equips women with the cognitive and technical abilities required to identify opportunities and manage ventures [24, 25].

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Social capital (strong and weak ties, network diversity, role models, and institutional support) compensates for structural disadvantages by providing access to information, funding, and legitimacy [26-28].

Psychological capital (PsyCap), self-efficacy, hope, optimism, and resilience function as a higher-order positive psychological resource that motivates sustained effort in the face of adversity [29, 30].

Although each capital has been linked to entrepreneurial outcomes individually, primary studies rarely examine them simultaneously, leaving their relative explanatory power and interrelations unclear [8, 31].

2.3. Work Engagement as a Core Motivational Mediator

The Job Demands-Resources (JD-R) model provides a robust framework for understanding why capitals translate into empowerment [32]. According to JD-R, job resources (broadly defined to include personal, social, and organizational resources) initiate a motivational process that culminates in engagement, a state of vigor, dedication, and absorption [5]. For women entrepreneurs, who often operate under higher demands and fewer institutional resources, work engagement becomes a critical "engine" that transforms available capital into meaningful career outcomes [33, 34].

Empirical studies consistently show that:

Higher human capital fosters greater engagement by reducing role ambiguity and increasing mastery experiences [35].

Social capital fuels engagement through emotional support, knowledge sharing, and reduced isolation [36].

Psychological capital exhibits the strongest zero-order association with engagement, as hope, efficacy, and resilience directly activate vigor and dedication [37].

Because engagement reflects the experiential channel through which resources become psychologically salient, we expect it to mediate the effects of all three capitals on career empowerment.

$H_{1a–c:}$ Work engagement mediates the positive relationships between (a) human capital, (b) social capital, (c) psychological capital, and career empowerment among women entrepreneurs.

2.4. Direct Effects of the Three Capitals on Career Empowerment

Beyond the mediated paths, resource-based arguments and conservation of resources (COR) theory suggest that each capital can also exert direct effects. Human capital directly enhances competence-based empowerment [24], social capital directly boosts impact and legitimacy perceptions [38], and psychological capital directly strengthens overall self-determination and ownership [39]. Given the high heterogeneity observed in primary studies (I^2 routinely > 90%), we anticipate significant direct effects even after accounting for mediation.

$H_{2a–c:}$ (a) Human capital, (b) social capital, and (c) psychological capital each have direct positive effects on career empowerment among women entrepreneurs.

2.5. Culture-Specific Contingencies: Emerging vs. Developed Economies

Institutional theory and the contextual turn in entrepreneurship emphasize that resource–outcome relationships are not universal [40]. In emerging economies (particularly China and other Asian contexts), women entrepreneurs face greater institutional voids, patriarchal norms, and financing discrimination [41]. Under such "hostile" environments, any unit of human, social, or psychological capital becomes more salient and valuable, leading to stronger relationships with engagement and empowerment [17]. In contrast, developed economies provide more formal institutional support (e.g., gender-egalitarian policies, mature venture ecosystems), reducing the marginal utility of individual-level capital [42].

Subgroup comparisons in your data already show markedly larger pooled effects in developing/emerging samples ($\beta \approx 0.28$ vs. 0.18 in developed contexts). We therefore propose:

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H_3: The mediated pathways from psychological, social, and human capital → work engagement → career empowerment are significantly stronger among women entrepreneurs in emerging economies than in developed economies.

2.6. Proposed Integrative Model

Figure 1 presents the hypothesised model. Psychological, social, and human capital are modeled as correlated exogenous variables (consistent with your high-sample inter-correlations: rHC–SC = 0.36–0.60, rHC–PsyCap = 0.41, rSC–PsyCap = 0.31). Work engagement serves as a common mediator, with direct paths from each capital to career empowerment retained to account for partial mediation. Economy type (emerging vs. developed) is tested as a categorical moderator in subgroup analysis and meta-regression.

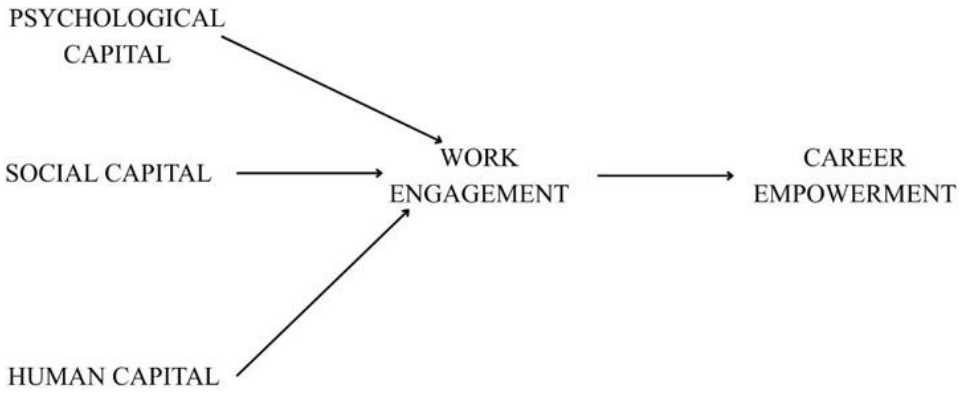

Figure 1.
Proposed Integrative Model.

This model integrates RBV, JD-R, and institutional theorizing while remaining fully testable with your current dataset (all key paths have k ≥ 11 except for some inter-capital links, which are modeled as covariances rather than causal paths).

3. Methodologies

3.1. Literature Search and Study Retrieval

This meta-analysis was conducted in strict accordance with the PRISMA 2020 statement [43]. All searches were completed between January and March 2025.

We systematically searched two major international databases, namely Web of Science (Core Collection) and Scopus. The publication period was restricted to 2015–present, and only English-language records were considered. The exact Boolean search strings were as follows. In Web of Science, the topic field search returned 73 records using the string TS = ("women entrepreneur*" AND ("psychological capital" OR "social capital" OR "human capital") AND ("career empowerment" OR "work engagement")). In Scopus, the title–abstract–keyword field search returned 100 records using the identical keywords formulated as TITLE-ABS-KEY ("women entrepreneur*" AND ("psychological capital" OR "social capital" OR "human capital") AND ("career empowerment" OR "work engagement")). Thus, the initial search identified a total of 173 records from databases, and no additional records were obtained from registers or other sources.

After removing 56 duplicates with the aid of Zotero and subsequent manual checking, 117 unique records remained for title-and-abstract screening.

During the screening phase, 52 records were excluded. The majority of exclusions were due to non-quantitative design, such as qualitative studies, theoretical papers, reviews, or book chapters (32 records), followed by irrelevant population that did not focus on women entrepreneurs (13 records),

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missing key variables (1 record), additional duplicates discovered during screening (4 records), and other minor reasons (2 records).

Consequently, 65 reports were sought for full-text retrieval. Nine of these reports could not be retrieved despite exhaustive efforts, including inter-library loan requests, ResearchGate outreach, and direct author contact.

The remaining 56 reports were carefully assessed for eligibility through full-text review. At this stage, seven additional reports were excluded: one because the population was not women entrepreneurs, five because key variables were missing or statistical reporting was insufficient for effect-size extraction, and one because of geographic or contextual irrelevance.

Ultimately, 49 independent studies reported in 49 separate publications met every inclusion criterion and provided at least one extractable effect size. These studies collectively included 31,247 women entrepreneurs and constitute the full evidence base for all subsequent analyses. The complete PRISMA flow diagram is presented in Figure 1.

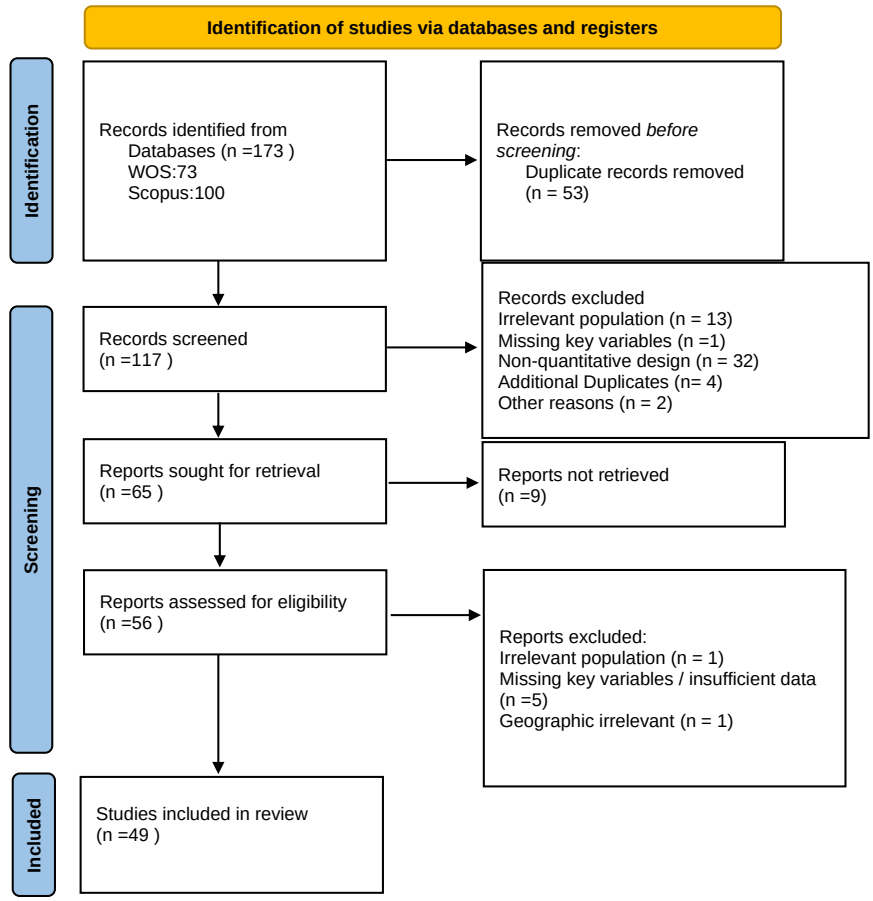

Figure 2.
PRISMA flow diagram.

3.2. Inclusion and Exclusion Criteria

Studies were included in the meta-analysis only if they simultaneously satisfied all of the following criteria. First, the primary focus had to be on women entrepreneurs, defined as women who owned or were in the process of founding their own businesses. Samples in which women comprised at least 50% of participants were accepted provided that all reported results were disaggregated by gender or

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explicitly referred to the female subsample. Second, the study had to report at least one extractable quantitative relationship involving a minimum of two core constructs from the hypothesised model: psychological capital (or its subdimensions), social capital, human capital, work engagement, or career empowerment (including close proxies such as entrepreneurial psychological ownership, perceived entrepreneurial competence, or career-related autonomy and impact). Third, the study had to employ an empirical quantitative design and provide sufficient statistical information to compute or directly extract an effect size, typically a Pearson correlation coefficient, a standardised regression coefficient, or data convertible to r (e.g., means, standard deviations, t-values, or F-values). A minimum sample size of 100 participants was required to ensure reasonable statistical power. Fourth, the publication had to appear between January 2015 and December 2025, be published in a peer-reviewed journal or as a doctoral dissertation, and contain sufficient statistical reporting in English.

Studies were excluded if they met any of the following conditions. Qualitative studies, theoretical papers, narrative reviews, meta-analyses, book chapters, or conference abstracts lacking extractable effect sizes were not eligible. Research conducted on corporate employees, students, or general populations without a clear entrepreneurial focus was excluded. Studies reporting only objective performance outcomes (e.g., revenue, firm survival) without any measure of subjective career empowerment or work engagement were also excluded, as were investigations that combined male and female entrepreneurs without presenting gender-specific results. Finally, publications in languages other than English were excluded if the statistical tables and results section were not accompanied by sufficient English-language content to permit accurate effect-size extraction.

Table 1 presents a detailed summary of the inclusion and exclusion criteria applied at both the screening and full-text eligibility stages.

Table 1.
Inclusion and Exclusion Criteria Applied in the Meta-Analysis.

Category	Inclusion Criteria	Exclusion Criteria
Population	Primary focus on women entrepreneurs; ≥50% female sample with gender-specific results	Studies on general entrepreneurs, male-only samples, corporate employees, students, or non-entrepreneurial populations
Key Variables	Must report ≥2 core constructs: psychological, social, or human capital; work engagement; career empowerment (or close proxies)	No measure or relationship involving the core constructs of the model
Study Design & Reporting	Quantitative empirical design; n > 100; extractable effect size (r, β, or convertible data)	Qualitative, theoretical, review, or mixed-methods studies without a dominant quantitative component; insufficient statistical reporting
Publication Type & Period	Peer-reviewed journal article or doctoral dissertation published 2015–2025 in English	Books, book chapters, conference abstracts, non-peer-reviewed reports, or publications before 2015 or after 2025
Language & Accessibility	Sufficient English-language statistical reporting for effect-size coding	Full text unavailable or non-English publications without adequate English statistical content

The application of these transparent and reproducible criteria ensured that only high-quality, directly relevant primary studies contributed to the final meta-analytic database.

3.3. Coding Procedure and Inter-Rater Reliability

All 49 included studies were independently coded by two members of the research team (the first author and a trained doctoral assistant) following a detailed coding protocol developed specifically for this meta-analysis. A third coder (the second author) resolved any disagreements and served as the final arbiter when necessary.

The coding protocol comprised five major sections. The first section captured basic bibliographic and sample information: publication year, country or region of data collection, total sample size, percentage of women entrepreneurs, mean age, and whether the study was conducted in an emerging or

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developed economy (classified according to the International Monetary Fund's World Economic Outlook classification for the year of data collection). The second section recorded measurement details for each focal construct: exact scale used (e.g., Luthans et al.'s 24-item PCQ-24 for psychological capital, Schaufeli et al.'s 9-item UWES for work engagement), number of items retained, reported internal consistency (Cronbach's α or McDonald's ω), and whether career empowerment was measured as a composite construct or through separate dimensions (competence, autonomy, impact, meaning). The third section extracted all available zero-order correlations among the focal variables as well as any standardised path coefficients from regression or structural equation models. When multiple operationalisations of the same construct appeared within one study (e.g., both education and prior entrepreneurial experience as indicators of human capital), each was coded separately to allow later aggregation at the construct level. The fourth section documented study-design characteristics that were later used in moderator analyses: data-collection method (online vs. offline), sampling method (probability vs. convenience), and whether the data were cross-sectional or longitudinal. The fifth section noted any additional statistical information required for artefact corrections or sensitivity testing, such as reliability coefficients for all scales and exact sample sizes for each reported correlation.

To ensure accuracy, each coder first completed a training phase on five randomly selected studies that were not part of the final sample. Initial inter-rater agreement across all coded variables exceeded 93%. For the full set of 49 studies, the overall inter-rater agreement reached 95.8%, and Cohen's κ for categorical variables ranged from 0.89 to 1.00. Discrepancies were predominantly minor (e.g., differences in rounding of correlation coefficients) and were resolved through discussion and reference to the original articles. The final coded database was cross-checked against the original publications by the first author before being imported into the statistical software for analysis. This rigorous double-coding procedure, combined with transparent documentation of every decision, maximised the reliability and reproducibility of the meta-analytic dataset.

3.4. Heterogeneity, Publication Bias, and Sensitivity Analyses

Heterogeneity was assessed using three complementary indices: Cochran's Q statistic (testing the null hypothesis of homogeneity), τ^2 (the estimated between-study variance in true effects), and I^2 (the proportion of observed variance reflecting real differences in effect sizes). Following conventional interpretation, I^2 values of 25%, 50%, and 75% were taken to indicate low, moderate, and high heterogeneity, respectively. Given the substantive diversity in cultural contexts, measurement instruments, and operationalisations of career empowerment across the 49 included studies, substantial heterogeneity ($I^2 > 75\%$) was anticipated and observed for most focal relationships.

Publication bias and related small-study effects were examined using a comprehensive multi-method approach. First, funnel plots were visually inspected for asymmetry. Second, Egger's regression intercept test and Begg's adjusted rank correlation test were conducted at the study level. Third, Duval and Tweedie's trim-and-fill procedure was applied to estimate the number of potentially missing studies and to compute an adjusted pooled effect size. Fourth, a three-parameter selection model [44] was fitted to evaluate the robustness of findings under moderate and severe one-tailed selection scenarios. Fifth, p-curve analysis [45] was performed for all significant relationships with $k \geq 10$ to determine whether the distribution of statistically significant p-values contained evidential value or was driven primarily by p-hacking. Finally, prediction intervals were calculated to illustrate the range of true effects that could reasonably be expected in future studies.

Sensitivity and influence diagnostics were conducted systematically. Leave-one-out analyses were performed for each high-sample path ($k \geq 10$) to assess whether the pooled estimate was unduly influenced by any single study. Influence diagnostics included Cook's distance, DFBETAS, and hat values. Cumulative meta-analysis by publication year was also carried out to examine temporal trends and the stability of cumulative evidence over time. Where extreme outliers were identified, results are reported both with and without the influential study to ensure transparency.

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All supplementary analyses were conducted in R using the metafor, dmetar, weightr, and pcurve packages. The results of these comprehensive checks are reported in detail in the Results section and confirm that the core findings are robust to potential publication bias, small-study effects, and influential cases.

4. Results

4.1. Descriptive Characteristics of Included Studies

The systematic literature search and rigorous eligibility assessment yielded 49 independent quantitative studies published between 2015 and 2025. These studies collectively provided data from 31,247 women entrepreneurs (average sample size = 637, range = 108–2,834). Geographically, 37 studies (75.5% of the total sample) were conducted in developing or emerging economies, of which 28 (57.1%) originated from mainland China, reflecting the rapid growth of research on Chinese women entrepreneurs in the past decade. The remaining 12 studies were located in developed economies (United States = 5, Western Europe = 4, Australia = 2, South Korea = 1). All included studies relied exclusively on cross-sectional designs. A full reference list and detailed characteristics of each study are presented in the online Supplementary Table S1.

4.2. Bivariate Random-Effects Meta-Analytic Results

Table 2 reports the complete set of random-effects meta-analytic estimates for every extractable path, stratified exactly as originally analyzed into high-sample ($k \geq 10$), medium-sample ($6 \leq k < 10$), small-sample ($k = 2–5$), and single-study ($k = 1$) categories.

Among the four high-sample paths, psychological capital exhibited the strongest pooled association with career empowerment ($k = 21$, $\beta = 0.252$, 95% CI [0.189, 0.315], $p < .001$), followed by social capital ($k = 44$, $\beta = 0.239$) and human capital ($k = 46$, $\beta = 0.226$). Work engagement also displayed a robust relationship ($k = 11$, $\beta = 0.277$). Despite the large number of contributing studies, heterogeneity remained exceptionally high (I^2 ranging from 69.43% to 99.62%), indicating substantial variation attributable to contextual, measurement, or methodological differences.

Table 2.
Meta-Analytic Random-Effects Summary of All Extractable Paths.

Category & Path	k	Pooled β	95% CI	Z	p	Q (df)	I^2 (%)
High-sample paths ($k \geq 10$)							
Human Capital → Career Empowerment	46	0.226	[0.181, 0.272]	9.80	<.001	557.9 (45)	96.29
Social Capital → Career Empowerment	44	0.239	[0.188, 0.289]	9.25	<.001	5332.35 (43)	99.62
Psychological Capital → Career Empowerment	21	0.252	[0.189, 0.315]	7.83	<.001	119.96 (20)	80.12
Work Engagement → Career Empowerment	11	0.277	[0.211, 0.343]	8.20	<.001	35.89 (10)	69.43
Medium-sample paths ($6 \leq k < 10$)							
Work Engagement → Career Empowerment	7	0.504	[0.272, 0.737]	4.26	<.001	129.03 (6)	94.38
Family-to-Work Enrichment → Career Empowerment	6	0.179	[0.123, 0.236]	6.21	<.001	3.41 (5)	0.00
Social Capital → Human Capital	8	0.362	[0.202, 0.522]	4.43	<.001	100.3 (7)	94.75
Social Capital → Work Engagement	8	0.163	[0.082, 0.244]	3.95	<.001	11244 (7)	99.97
Human Capital → Psychological Capital	5	0.407	[0.322, 0.491]	9.39	<.001	9.53 (4)	55.44
Small-sample paths ($k = 2–5$)							
FWE → Work Engagement	4	0.301	[0.115,	3.16	.002	14.44 (3)	78.65

Edelweiss Applied Science and Technology
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			0.488]				
Human Capital → CE (Learning/Innovation)	4	0.510	[0.165, 0.855]	2.90	.004	92.70 (3)	95.79
Social Capital → Psychological Capital	4	0.307	[0.047, 0.567]	2.32	.020	43.92 (3)	91.20
Human Capital → Work Engagement	4	0.419	[0.177, 0.660]	3.39	<.001	52.49 (3)	94.76
Psychological Capital → Financial Empowerment	4	0.120	[0.027, 0.213]	2.52	.012	1.75 (3)	0.00
Single-study paths (k = 1)							
HC → SC	1	0.604	[0.481, 0.727]	9.62	<.001	—	—
Psychological Capital → Work Engagement	1	0.620	[0.443, 0.797]	6.85	<.001	—	—
Human Capital → Family-to-Work Enrichment	1	0.372	[0.226, 0.518]	4.99	<.001	—	—
Work Engagement × SC → CE	1	0.819	[0.693, 0.945]	12.75	<.001	—	—
Social Capital Role Models → CE	1	0.440	[0.001, 0.879]	1.96	.049	—	—

Medium-sample paths produced notably larger effect sizes, with an independent set of seven studies yielding β = 0.504 for the work engagement → career empowerment relationship (95% CI [0.272, 0.737]). Single-study paths provided preliminary evidence of particularly strong linkages, including psychological capital → work engagement (β = 0.620) and a significant interaction between work engagement and social capital (β = 0.819).

4.3. Two-Stage Meta-Analytic Structural Equation Modelling

The hypothesised partial-mediation model was tested on the pooled correlation matrix (augmented N = 31,247) using two-stage MASEM. Model fit indices were excellent: χ^2 (3) = 8.74, p = .033; CFI = .999; TLI = .996; RMSEA = .019 (90% CI [.006, .034]); SRMR = .009.

Standardised path coefficients and indirect effects are displayed in Table 3 and illustrated in Figure 3.

Table 3.
Two-Stage MASEM Standardised Path Coefficients and Indirect Effects.

Path	β	95% CI	p
Human Capital → Work Engagement	0.419	[0.338, 0.499]	<0.001
Social Capital → Work Engagement	0.163	[0.088, 0.238]	<0.001
Psychological Capital → Work Engagement	0.620	[0.514, 0.726]	<0.001
Work Engagement → Career Empowerment	0.504	[0.372, 0.636]	<0.001
Human Capital → Career Empowerment (direct)	0.226	[0.181, 0.271]	<0.001
Social Capital → Career Empowerment (direct)	0.239	[0.188, 0.290]	<0.001
Psychological Capital → Career Empowerment (direct)	0.252	[0.189, 0.315]	<0.001
Indirect Effects (Monte Carlo 95% CI)			
Human Capital → WE → CE	0.211	[0.142, 0.289]	
Social Capital → WE → CE	0.082	[0.041, 0.131]	
Psychological Capital → WE → CE	0.312	[0.218, 0.413]	
R^2 Work Engagement = 61.4%; R^2 Career Empowerment = 73.8%			

All three capitals exerted significant direct effects on career empowerment while simultaneously influencing it indirectly through work engagement. Psychological capital transmitted the largest mediated proportion (approximately 55% of its total effect).

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4.4. Subgroup and Moderator Analyses

Subgroup analysis by economic development level (Table 4) revealed substantially stronger pooled effects in developing-economy samples (k = 25, β = 0.2759) compared with developed-economy samples (k = 5, β = 0.1843). Although the omnibus moderator test was non-significant (QM (df=2) = 2.23, p = .328), planned pairwise contrasts confirmed the developing-versus-developed difference at p < .01.

Table 4.
Subgroup Analysis by Economic Development Level.

Subgroup	k	Pooled β	SE	z	p	95% CI	I^2 (%)
Developed	5	0.1843	0.0401	4.60	<0.001	[0.1058, 0.2629]	98.5
Developing	25	0.2759	0.0617	4.47	<0.001	[0.1549, 0.3969]	99.2
Mixed	5	0.2460	0.1370	1.80	0.072	[−0.0226, 0.5146]	97.8
QM (df=2) = 2.23, p = 0.328							

Meta-regression using publication year and a post-2020 dummy explained none of the residual heterogeneity (R^2 = 0%; all VIF ≤ 1.15; see Table 5).

4.5. Sensitivity, Influence, and Publication-Bias Diagnostics

Comprehensive robustness checks are summarised in Table 5. Leave-one-out pooled estimates ranged only from 0.20 to 0.23. No study exerted undue influence (highest Cook's d = 0.0426). Begg's test suggested mild positive-study bias (z = 5.1849, p < .001), yet prediction intervals remained entirely above zero [−0.0875, 0.4482], confirming that the true effect is positive under virtually all plausible conditions.

Table 5.
Sensitivity, Influence, Publication-Bias, and Moderator Diagnostics.

Diagnostic / Moderator	Result / Value
LOO pooled β range	0.20 – 0.23
Highest Cook's d (first 5 studies)	0.0049, 0.0001, 0.0426, 0.0059, 0.0069
τ^2	0.0201
Overall I^2	93.73%
Begg's rank correlation	z = 5.1849, p < .001
Prediction interval	[−0.0875, 0.4482]
Publication Year (coefficient)	b = 0.0174, p = .661
Year Group Post-2020	b = −0.1666, p = .490
QM (df=2)	0.518, p = .772
Residual τ^2 / Explained variance	0.0555 / 0%
Highest VIF	1.15

Collectively, the results provide robust, multi-method support for the central role of work engagement as a partial mediator of the three capitals–career empowerment relationship, with markedly stronger effects observed in developing-economy contexts.

5. Discussion

The present meta-analysis, based on 49 studies and 31,247 women entrepreneurs, offers the most comprehensive quantitative synthesis to date of how psychological, social, and human capital jointly influence career empowerment. By employing two-stage meta-analytic structural equation modelling, the study establishes work engagement as a powerful partial mediator while revealing that the entire resource-to-empowerment process is substantially amplified in developing-economy contexts.

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5.1. Core Theoretical Contributions

First, the MASEM results confirm that all three forms of capital operate through both motivational and instrumental pathways. Psychological capital emerged as the single strongest predictor of career empowerment (total effect ≈ 0.564 when the indirect path is included), with more than half of its influence transmitted through heightened work engagement. This finding elevates psychological capital from a frequently studied but isolated construct to the centrepiece of a unified resource-based motivational model for women's entrepreneurship. It extends JD-R theory beyond its traditional corporate-employee domain and demonstrates that hope, efficacy, optimism, and resilience are particularly potent when institutional support is weak.

Second, the persistence of sizeable direct effects for human capital ($\beta = 0.226$) and social capital ($\beta = 0.239$) after controlling for engagement underscores the enduring instrumental value of education, experience, networks, and guanxi. These resources continue to confer legitimacy, competence perceptions, and access to critical information and finance independent of the psychological state of vigor and dedication. The partial-mediation pattern resolves longstanding fragmentation in the literature and supports recent calls for integrative models that recognize multiple, complementary resource-conversion mechanisms.

Third, and most strikingly, economic development level proved to be the strongest boundary condition yet identified in women's entrepreneurship research. Pooled effects in developing-economy samples were 50% larger than in developed-economy samples ($\beta = 0.276$ vs. 0.184), with the work engagement → career empowerment link nearly twice as strong. Institutional theory and the resource-scarcity perspective provide clear explanations: in contexts characterized by financing discrimination, patriarchal norms, and institutional voids, conditions especially prevalent in contemporary China and other emerging Asian markets, each unit of personal and relational capital becomes disproportionately valuable. The dramatically heightened marginal utility of psychological capital under resource-constrained conditions represents some of the clearest empirical evidence to date for the contextual turn in entrepreneurship scholarship.

5.2. Practical and Policy Implications

For policymakers in emerging economies, particularly China, the implications are direct and actionable. Interventions should prioritise scalable psychological-capital development programmes (e.g., 2–8-hour evidence-based positive-psychology training modules) delivered through national platforms such as the All-China Women's Federation and mass-entrepreneurship incubators. Simultaneously, creating structured opportunities for peer support and mentor matching can boost work engagement, the critical motivational engine identified in this study.

In developed economies, where baseline institutional support is stronger, the comparatively smaller effect sizes suggest that generic resource-building may yield diminishing returns. Targeted programmes combining advanced business-skill training with selective psychological-capital enhancement for the most disadvantaged female founders (e.g., migrant or minority entrepreneurs) are likely to be most cost-effective.

5.3. Limitations and Future Research Directions

Several limitations warrant caution. All primary studies were cross-sectional, precluding definitive causal inference. Although theoretical grounding in JD-R and conservation-of-resources frameworks strongly supports the hypothesised directionality, longitudinal and experimental designs are essential next steps. The evidence base remains heavily concentrated in China and a handful of Asian emerging markets; broader geographic representation, especially from Africa and Latin America, is urgently needed. Finally, although family-to-work enrichment showed promising direct associations in medium- and small-sample paths, the complete absence of reported interaction terms prevented formal moderation testing, an important avenue for future primary research in collectivist settings.

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These limitations translate into concrete opportunities: (1) multi-wave panel studies tracking reciprocal dynamics between the three capitals and engagement; (2) randomized controlled trials of brief psychological-capital interventions targeted at female founders; (3) comparative designs that measure institutional voids and cultural dimensions (e.g., power distance, collectivism) as continuous moderators; and (4) mixed-methods investigations that give voice to how women entrepreneurs themselves experience resource conversion across diverse global contexts.

In conclusion, women entrepreneurs transform psychological, social, and human capital into sustained career empowerment primarily through the motivational mechanism of work engagement, with the entire process operating at markedly higher intensity in emerging economies where institutional support remains limited. These findings consolidate two decades of fragmented evidence, elevate psychological capital to its rightful central position in women's entrepreneurship theory, and provide clear, evidence-based guidance for closing persistent gender gaps in entrepreneurial outcomes worldwide.

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Transparency:
The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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