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Media Portrayal Construction of Female Scientists in the New Media Era: A Case Study of WeChat Official Accounts

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Abstract. Amidst the growing awareness of gender equality, the media portrayal of female scientists not only concerns the dissemination of their individual professional value but also reflects the interplay between societal gender perceptions and the ecology of science communication. This study analyzes the top 30 most popular articles on WeChat Official Accounts, employing content analysis and discourse analysis to investigate the logic behind the media construction of female scientists' images. It specifically examines dimensions such as reporting tendencies, themes, subjects, sources, textual features, and rhetorical strategies. The aim is to reveal the characteristics, influencing factors, existing problems, and optimization pathways in the current construction of female scientists' media images. Findings indicate that while current coverage is predominantly positive and affirming, it retains implicit gender frameworks and exhibits shortcomings in gender narratives, dimensional richness, and communication synergy. Factors influencing image construction include socio-cultural attitudes, media communication logic, the ecology of the scientific community, and policy and societal environments. The study concludes that shaping a more inclusive and authentic media portrayal of female scientists necessitates balancing narrative focus, deepening image dimensions, optimizing communication synergy, and constructing an ecological system. This research contributes to promoting gender equality in science communication, provides theoretical and practical references for enriching the diverse images of female scientists, and holds significant implications for encouraging women to pursue scientific careers.

Keywords: Female Scientists, Media Portrayal, Science Communication, Gender Equality, Textual Analysis

1. Introduction

Media portrayals of female scientists act as a prism refracting societal gender perceptions and science communication ecology. As gender-equality consciousness awakens, examining these portrayals transcends individual representation to impact science communication equity and socio-cultural evolution [1]. Socially, science communication bears the mission of popularizing scientific knowledge and shaping scientific culture. As vital members of the scientific community, the portrayal of female scientists directly influences public perception of the gender inclusivity within scientific professions. Culturally, the media's representation of female scientists serves as a concrete

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expression of societal gender norms while simultaneously shaping public understanding of the relationship between women and science [2].

This study employs two analytical methods—content analysis and discourse analysis—providing an effective pathway to decode the logic behind the construction of female scientists' media images [3]. It contributes to building a more inclusive, authentic, and dynamic science communication context.

2. Textual analysis of female scientist portrayals

2.1. Reporting tendency: implicit tensions beneath a positive tone

Overall, over 80% of the articles adopt a fundamentally positive and affirming tone, focusing on female scientists' research breakthroughs and professional dedication, conveying the value judgment of women empowering scientific development. These reports center on academic achievements, such as key technological breakthroughs and theoretical innovations, as well as social contributions. They strengthen public recognition of female research capabilities and construct a professional, enterprising, and valuable image framework. However, approximately 15% of the coverage exhibits residual implicit gender frameworks, inappropriately embedding aspects like female scientists' appearance or family roles into the scientific narrative [4]. Only about 5% of reports present neutral or weakly negative tendencies due to events like research controversies or resource allocation issues, but these do not form the mainstream and pose no substantial challenge to the dominant positive tone.

2.2. Reporting themes: interwoven dimensions of scientific and social value

Reporting themes reveal a deep intertwining of scientific achievements and social value, encompassing four core dimensions: Firstly, frontier research breakthroughs focus on female scientists' technical achievements in fields like medicine, engineering, and astronomy, such as new material development or disease prevention system construction, constituting approximately 35% of the sample and highlighting the pioneering nature of scientific exploration. Secondly, career development trajectories narrate stories ranging from academic inspiration, like childhood scientific interests or educational opportunities, to career advancement, such as becoming research leaders or institutional administrators, accounting for 25% of the sample and exploring how personal growth nourishes scientific careers. Thirdly, science communication and education revolve around public outreach efforts like science programs or popular science books, and nurturing future talent through student mentorship or educational platforms, making up 20% of the sample and showcasing the social value of scientific inheritance. Fourthly, scientific contributions from a gender perspective emphasize the significance of women breaking gender barriers in research, depicting transitions from marginal to mainstream roles, accounting for 20% of the sample and echoing societal demands for gender equality [5]. These themes are nested, with 60% of reports integrating scientific achievements with social impact, constructing a multi-dimensional narrative combining professional capability and social significance. This grounds the image of female scientists in scientific essence while extending it into the socio-cultural sphere.

2.3. Featured subjects: a diverse scientific landscape

The featured subjects span 12 disciplinary fields, including medicine, engineering, and astronomy, vertically covering career stages from academicians and university professors to key research team

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members, and horizontally encompassing women of different ages and regional backgrounds. Among them, 40% are senior scientists, such as academicians or discipline founders, who, with their profound academic accumulation and industry influence, become symbols of scientific spirit transmission. 35% focus on mid-career and young research leaders like laboratory heads or project leaders, showcasing innovative vitality within the research relay. 25% spotlight emerging scholars such as postdoctoral researchers and young investigators, uncovering the growth potential of the next scientific generation. This coverage breaks the stereotype of women being active only in soft sciences, demonstrating female competitiveness in fields like basic research and applied sciences [6]. It constructs a picture of a scientific community characterized by intergenerational legacy and disciplinary diversity, conveying the idea that science has no gender boundaries.

2.4. Reporting sources: synergy and contention among diverse actors

Communication sources exhibit characteristics of multi-actor synergy: University official platforms comprise 30% of the sample, focusing on academic legacy and emphasizing institutional research environments like laboratory development and discipline advancement, thereby strengthening institutional branding and academic orthodoxy [7]. However, they often exhibit a promotional narrative tendency, leaning towards listing achievements with insufficient storytelling. Science media, comprising 40% of the sample, leverage their scientific expertise to focus on industry trends (e.g., interpreting research developments or discussing academic controversies), while pursuing content depth and maintaining scientific rigor. Yet, their high professional threshold can weaken dissemination breadth. General media constitute 30%, balancing social relevance and adeptness at uncovering stories involving gender and humanistic dimensions, such as the growth challenges or social role conflicts faced by female scientists, enhancing relatability. However, excessive storytelling can lead to distortion of scientific content.

2.5. Textual features and rhetorical strategies: image shaping through discourse construction

Text serves as the core carrier for the media's presentation of female scientists' images. Its linguistic choices, narrative structures, and rhetorical applications collectively constitute the discourse system shaping the image, reflecting both media perceptions of female scientists and subtly guiding public understanding.

In terms of narrative structure, most texts adopt a three-part framework: personal experience—research achievement—social impact, connecting content chronologically or logically. The opening often starts with personal growth stories, such as childhood scientific inspiration or educational choices, to build reader connection. The middle section focuses on specific research outcomes, using data and cases to enhance professionalism. The conclusion extends to the impact on the field or society, elevating the image's social value. While this structure balances storytelling and professionalism, it can also lead to an overemphasis on overcoming gender barriers or the use of contrastive narratives that may reinforce gender binary opposition.

Overall, two implicit gender frameworks exist in the current texts: Firstly, the "contrast framework," using expressions like "breaking through in a male domain" or "shattering male monopolies," positions female scientists' achievements within a context of gender opposition. While affirming breakthroughs, it reinforces the notion that "scientific fields have inherent gender attributes." Secondly, the "correction framework," operating on the logic that "women can also excel at research," positions the image of the female scientist as a "corrective tool" against the "women are

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unsuited for science" stereotype, perpetually placing them in a passive position of needing to "prove" themselves.

3. Factors influencing image construction

3.1. Socio-cultural attitudes: deep-seated contestation of gender perceptions

Within socio-cultural contexts, the contestation between traditional gender norms and equality consciousness profoundly influences image construction [8]. On one hand, the persistent stereotype of male dominance in science affects approximately 40% of the coverage. This leads to attributing female scientists' success to overcoming gender barriers rather than professional merit. This narrative construct science as a domain of female adversity and breakthrough, thereby reinforcing public perceptions of inherent gender disparities in research – a cycle that perpetuates systemic bias. On the other hand, the awakening of gender equality consciousness drives about 60% of the coverage back towards a professional focus, centering on scientific contributions and innovation logic, attempting to erase gender labels.

3.2. Media communication logic: balancing attention and professionalism

Driven by the attention economy, media communication logic involves multiple trade-offs: Firstly, a storytelling tendency is evident, with approximately 55% of reports selecting narrative materials like overcoming adversity or juggling multiple roles to enhance appeal and meet audience demand for human-interest stories. However, these risks diminishing the professionalism of scientific content through excessive dramatization [9]. Secondly, the imperative is to strike a judicious balance between scholarly rigor and public accessibility. Science media pursue rigor through expertise but reduce reach through technical jargon. General media simplify content for accessibility but risk scientific distortion, affecting accurate public understanding of female scientists' professional capabilities. Thirdly, topic selection bias occurs, influenced by social hotspots and policy direction. Media disproportionately focus on female scientists in prominent fields like medicine and engineering, providing insufficient coverage of fundamental disciplines such as mathematics or theoretical physics, leading to imbalanced representation.

3.3. Policy and societal environment: macro-contextual drivers and constraints

Policy and societal environments constitute the macro-context for image construction: Firstly, policy benefits. Policies supporting female scientific talent, such as targeted research funding or career development guarantees, provide a positive material base for approximately 70% of reports. Examples include achievements emerging under policy support and career advancement cases, reinforcing signals that women can grow and contribute significantly in science. Secondly, societal attention focus. The convergence of national strategies for scientific advancement and societal demands for gender equality drives increased media investment in coverage, with about 30% of the sample explicitly echoing policy directions and raising its communication priority. Thirdly, regional and disciplinary disparities. Patchy policy rollout—richer resources and stronger incentives in tier-one cities—and discipline-biased funding that privileges applied over basic sciences skew both geography and field, yielding denser, more lavish portrayals of female scientists in the nation’s top metropolises. These interconnected factors—socio-cultural attitudes, media logic, and policy environment—collectively shape the media image of female scientists, creating a complex landscape of representation that is both driven and constrained by broader societal forces.

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4. Reflection on media portrayal construction of female scientists

4.1. Existing problems

4.1.1. Imbalanced gender narrative

Approximately 20% of reports overemphasize gender identity, framing women's engagement in science as an anomaly that breaks gender conventions. This constructs a stereotypical perception of gender abnormality in scientific fields. Such coverage focuses on gender breakthroughs rather than scientific contributions, burdening the image of female scientists with excessive gender labels. It fails to achieve gender-neutral professional communication, essentially representing a residue of traditional perspectives in the contestation of gender norms, undermining the objectivity of science communication.

4.1.2. Limited dimensionality of image

Over 30% of reports fall into a templated narrative of "achievements plus inspirational story." They inadequately explore the uniqueness of female scientists' research thinking—such as interdisciplinary innovation logic or problem-solving perspectives—and their contributions to cross-disciplinary integration, like the fusion of art and science or collaboration across different fields. The portrayal concentrates on showcasing results and personal struggle, struggling to reflect the complexity, innovativeness, and diverse values inherent in scientific work. This leads to a flattened image that cannot fully demonstrate the professional depth and career substance of female scientists.

4.1.3. Insufficient communication synergy

Communication synergy faces three dilemmas: Firstly, the conflict between professionalism and accessibility. 40% of reports weaken professional depth through excessive simplification of scientific content, while 25% reduce readability in pursuit of rigor, hindering public comprehension. Secondly, imbalance in fields and regions. Coverage concentrates on female scientists in prominent fields like medicine and engineering and in advantaged regions, providing insufficient coverage of fundamental disciplines and peripheral regions, causing bias in representation. Thirdly, fragmentation among communication actors. Universities, science media, and general media, due to differing orientations, struggle to align their narrative logics. Consequently, portrayals fragment: universities spotlight academic pedigree while mainstream media foreground gender narratives, diluting the coherence of the message.

4.2. Pathways for shaping portrayal

4.2.1. Balance narrative focus: return to professional core

Media need to strip away excessive gender labels and refocus on the core professional identity of scientists. Gender should serve as supplementary context, with emphasis placed on innovative research methods, the logic of theoretical breakthroughs, and contributions to disciplinary development, rather than deliberately dramatizing gender breakthroughs. For example, reports should reduce narratives on how female researchers overcome gender obstacles and increase content on the uniqueness of their scientific thinking and the social value of technological innovation. Anchoring communication in professional competence enables objective presentation within a

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gender equality context, allowing the public to first recognize scientific contributions before naturally perceiving gender significance.

4.2.2. Deepen image dimensions: uncover diverse value

Enhance deep collaboration between media and the scientific community to uncover diverse value in three aspects: Firstly, research thinking: Showcase female scientists' unique perspectives in interdisciplinary integration and problem deconstruction, such as innovations at the art-science intersection. Secondly, professional ecology: Present roles across the full academic-industry-popularization spectrum, like transitioning from basic research to technology transfer and public outreach, highlighting career diversity. Thirdly, individual personality: Capture interests and values beyond research, such as reflections on scientific ethics or support for junior scholars, shaping a multi-dimensional image combining professionalism and personality. By surfacing a spectrum of personal and professional values, we can dismantle the “achievement-plus-inspiration” formula and craft narratives that mirror the true complexity of the research ecosystem.

4.2.3. Optimize communication synergy: enhance professional dissemination efficacy

Build mechanisms for professional-communication synergy: Cultivate teams with both scientific literacy and communication skills, or establish deep collaboration with the scientific community through measures like appointing science communication advisors or co-building popular science content libraries. In reporting, use accessible language to explain professional content. Employ methods like case analogies or narrative scene-setting—for instance, using the daily application of BeiDou navigation to explain the technological value of a female scientist's work—to help the public understand the value and process of research while preserving scientific rigor. This both demonstrates the professional strength of female scientists and achieves effective communication.

4.2.4. Construct ecosystem: multi-actor collaborative governance

Promote collaborative governance involving government, media, the scientific community, and the public: Governments should improve policy guarantees, such as equitable resource distribution and gender-neutral research evaluation, optimizing the macro-environment for image construction. Media must fulfill responsibilities for professional communication and social guidance, balancing narratives and deepening content. The scientific community should strengthen self-presentation awareness, proactively providing diverse materials like research process documentation or short science videos. The public needs to enhance scientific literacy and gender equality awareness, forming a positive cycle of understanding, recognition, and dissemination. Through multi-actor collaboration, a healthy and inclusive communication ecosystem can be built, ensuring the diverse images of female scientists accurately reach the public and advancing the gender equality process in science communication.

5. Conclusion

This study examines the media portrayal of female scientists through an analysis of 30 popular articles from WeChat Official Accounts, employing content and discourse analysis to identify key characteristics, influencing factors, and optimization paths. The findings reveal that while current coverage is predominantly positive—highlighting female scientists’ academic breakthroughs, professional dedication, and social contributions—it retains implicit gender frameworks. These

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frameworks, such as overemphasizing “balancing family and career” or framing success as “breaking male dominance,” reflect underlying tensions between traditional gender norms and evolving equality consciousness [10].

The construction of these media images is shaped by multiple interconnected factors: socio-cultural attitudes, which drive contests over gender perceptions; media communication logic, marked by trade-offs between professionalism and audience appeal under the attention economy; and policy and societal environments, which provide macro-level support and constraints. Three core issues are identified: imbalanced gender narratives that prioritize gender identity over professional contributions, limited image dimensionality trapped in “achievement-plus-inspiration” templates, and insufficient communication synergy among diverse media actors. Correspondingly, optimization pathways include refocusing on the professional core, deepening image diversity, enhancing collaborative dissemination, and building a multi-actor governance ecosystem.

Future research should expand sample diversity, incorporate qualitative insights from scientists and audiences, and adopt longitudinal or cross-cultural comparisons to further advance gender-equitable science communication.

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