Factors Influencing the Dissemination Effect of Scientific Journal Videos on Bilibili: An Empirical Study

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Abstract

[Objective] A thorough investigation and understanding of the factors influencing video communication effectiveness of scientific journals holds significant practical implications for advancing journal media construction and promoting the broad dissemination of research achievements. [Method] This paper constructs a theoretical framework for identifying these influencing factors by examining communication elements and processes, and by following the audience's psychological transformation process to refine communication effectiveness. Communication data were collected from journals selected for the "Excellence Action Plan of Chinese Science and Technology Journals" (excluding popular science journals) on Bilibili, and multiple linear regression analysis was employed to conduct an empirical study. [Results] The influencing factors primarily include: communication subject elements, such as integrated subjects and sponsor types; communication channel elements, such as account verification and update frequency; and communication content elements, such as content themes, number of tags, subtitles, and release timing. [Conclusion] To enhance video communication effectiveness, diversified strategies are proposed: encouraging journals to "band together", strengthening resource mobilization by sponsors, improving account credibility, maintaining moderate activity levels, building content brands, delivering precise content, and optimizing push strategies.

Full Text

Empirical Study on Factors Influencing the Communication Effect of Scientific Journal Videos on Bilibili

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Abstract

[**Purpose**] Deeply investigating and understanding the factors influencing the communication effectiveness of scientific journal videos holds significant practical importance for advancing journal media construction and promoting the broad dissemination of scientific research achievements. [**Methods**] This study departs from communication elements and processes, following the audience's psychological transformation process to refine the measurement of communication effects, and constructs a theoretical framework for identifying factors that influence the communication effectiveness of scientific journal videos. We collected dissemination data from Bilibili for journals selected in the "Excellence Action Plan for Chinese STM Journals" (excluding popular science journals) and employed multiple linear regression analysis to conduct an empirical investigation into these influencing factors. [**Results**] The primary factors affecting the communication effectiveness of scientific journal videos on Bilibili include: communication subject elements such as integrated operation models and organizer types; communication channel elements such as account verification and update frequency; and communication content elements such as content themes, number of tags, subtitles, and release timing. [**Conclusions**] Based on these

findings, we propose diversified strategies to enhance video communication effectiveness: encouraging journals to "huddle together for warmth," strengthening resource mobilization by organizing institutions, improving account credibility, maintaining moderate activity levels, building content brands, delivering precise content, and optimizing distribution tactics.

Keywords: Scientific journals; Video communication; Influencing factors; Communication effect; Bilibili

1. Introduction

In 2019, the China Association for Science and Technology, the Publicity Department of the Central Committee of the Communist Party of China, the Ministry of Education, and the Ministry of Science and Technology jointly issued the "Opinions on Deepening Reform to Cultivate World-Class Scientific and Technological Journals" [1], implementing the "Excellence Action Plan for Chinese STM Journals." This initiative explicitly called for comprehensively advancing digitalization and promoting integrated development across all media in the optimization of scientific journal publishing structures. In 2020, the General Office of the Central Committee of the Communist Party of China and the State Council issued the "Opinions on Accelerating the In-Depth Development of Media Convergence" [2], emphasizing the need to drive convergence development through advanced technology, innovate content presentation forms, and enhance communication effectiveness. These important policies provide clear direction for scientific journals to innovate communication models, accelerate knowledge service transformation [3], and build world-class journals in the context of media convergence.

As video has gradually become a new channel for people to obtain and disseminate information [4], its importance in scientific research communication has become increasingly prominent, with major new media platforms emerging as new frontiers for scientific journal video dissemination. Deeply investigating and understanding the factors influencing the communication effectiveness of scientific journal videos holds significant practical importance for advancing journal media construction and promoting the broad dissemination of scientific research achievements.

Bilibili is an online cultural community in China where young people congregate, focusing on original content and emphasizing knowledge-based videos. As of May 2023, three Nobel laureates, seven academicians from the Chinese Academy of Sciences and Chinese Academy of Engineering, and a cumulative total of 645 renowned scholars have established presences on Bilibili [5]. The platform's user base is highly youthful, with core users having received good education and possessing high cultural literacy [3], overlapping significantly with the target audience for Chinese scientific journal videos. Consequently, Bilibili has become an important platform for scientific journal video dissemination. Numerous

high-impact scientific journals have already opened video accounts on Bilibili, including *Bulletin of Chinese Academy of Sciences* and *Acta Mechanica Sinica*.

Regarding research progress on scientific journal video communication, scholars have explored influencing factors from various platforms such as Douyin [6], Bilibili [7], and WeChat Channels [8], with research content evolving from qualitative to quantitative approaches and from simple statistics to model construction. Early studies demonstrated the feasibility of short video integration with journals. For instance, Lu Xiaojing et al. [9] used the "Uses and Gratifications" theory to explain the compatibility between academic journals and short videos, qualitatively proposing application strategies from perspectives of content selection, generation mechanisms, and guarantee mechanisms. Subsequently, scholars began using statistical methods to reveal problems in journal short video operations. Liu Yang et al. [10] examined the operational status of medical journals' WeChat Channels, identifying issues such as low adoption rates and weak operational awareness. Further research has progressively deepened in data analysis, model construction, and indicator weighting.

In terms of communication effects, most studies categorize effects into communication breadth, communication recognition, and communication participation [11]. However, this classification method inadequately captures the audience's psychological transformation process, resulting in relatively weak subsequent strategic hierarchies. Regarding weighting of communication effects, relevant studies often borrow weights from other research [11-12] without thoroughly examining their origins or verifying their applicability to their specific research objects.

Therefore, this study aims to build upon existing research by constructing a theoretical framework for identifying factors influencing scientific journal video communication effectiveness, starting from communication elements and processes and following the audience's psychological transformation process to refine effect measurement. Based on comprehensive Bilibili investigation data, we conduct quantitative empirical exploration using multiple linear regression analysis. Finally, according to the identified key influencing factors, we propose strategic recommendations from three dimensions—communication subject, communication channel, and communication content—to optimize scientific journals' video communication effectiveness on Bilibili.

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2. Research Framework and Methods

2.1 Theoretical Foundation

According to Lasswell's 5W model [13], the communication process follows the pattern: who (communicator) → says what (message) → to whom (receiver) → through what channel (medium) → with what effect (effect), corresponding to five basic elements: communication subject, communication content, communi-

cation audience, communication channel, and communication effect. Communication effect is the product of the communication process and serves as a crucial measure of its success [14].

Guo Qingguang [15] divides communication effects into micro and macro levels: the former involves micro-process analysis focusing on specific effects of communication processes, while the latter involves macro-process examination focusing on comprehensive effects. This study's objective is to propose recommendations for improving scientific journal video communication effectiveness on Bilibili, placing it at the micro level and thus making micro-level analysis more appropriate. Specifically, we examine audience reactions across cognitive, emotional, attitudinal, and behavioral dimensions after communication content reaches them.

Based on this micro-level definition, the communication effect of scientific journal videos on Bilibili can be divided into four sequential layers. The first is the cognitive level: communication content acts on the audience's perception and memory systems, increasing knowledge and changing cognitive structures—cognitive effect. The second is the emotional level: communication content acts on audience concepts, triggering emotional changes—emotional effect. The third is the attitudinal level: communication content acts on audience value systems, causing attitudinal changes—attitudinal effect. The fourth is the behavioral level: the aforementioned changes manifest through audience words and actions—behavioral effect. These four layers represent a gradual process of accumulation, deepening, and expansion from cognition to emotion, attitude, and finally action.

In new media communication, the first three effects intersect with behavioral effects to some extent. Through new media technologies, audience internal activities can be monitored through their behaviors from the moment they encounter content. For example, when audiences watch videos, their cognition changes to varying degrees, making video play counts a partial reflection of cognitive effect. If audiences positively evaluate videos or engage in deeper thinking, they may like or comment, making like counts and comment numbers partial reflections of emotional effect. If audiences are consistently interested in videos from a particular subject, they may follow the account to receive timely updates, making follower counts a partial reflection of attitudinal effect. Traditional media's behavioral effects primarily involve social behavior demonstration effects—deeper influences on audiences independent of communication channels, such as citing research after watching academic videos. Such effects are difficult to monitor on Bilibili and are therefore not addressed in this study.

Since cognitive, emotional, and attitudinal effects represent a gradually accumulating and deepening process, strong theoretical correlations should exist among them. The empirical section will conduct correlation analysis to verify the rationality of indicator selection.

Accordingly, this study constructs a theoretical framework for identifying fac-

tors influencing scientific journal video communication effectiveness (see Figure 1 [Figure 1: see original paper]), with three communication elements (communication subject, communication channel, and communication content) as independent variables and communication effects presented by the audience (cognitive, emotional, and attitudinal categories) as dependent variables. We use the subjective method (Analytic Hierarchy Process) to weight communication effects and obtain comprehensive scores, then conduct multiple linear regression analysis between independent and dependent variables to identify key influencing factors. Finally, we employ the objective method (entropy method) to recalculate weights and conduct regression analysis to test the robustness of main results.

2.2 Variable Measurement

2.2.1 Dependent Variable: Communication Effect The dependent variable is communication effect, measured across three dimensions: cognitive, emotional, and attitudinal effects (see Table 1).

Table 1: Measurement Indicators for Scientific Journal Video Communication Effects on Bilibili

Effect Dimension	Measurement Indicators
Cognitive Effect	Play count, share count, favorite count
Emotional Effect	Like count, comment count, danmaku count, coin count
Attitudinal Effect	Account follower count

Cognitive effect represents audiences' superficial reactions to videos, manifested as acceptance and sharing of content. Audience cognition occurs through watching videos, measurable through play counts. This includes three scenarios: (1) audiences actively accessing or passively receiving video pushes; (2) favoriting videos for future viewing, potentially increasing play counts; and (3) sharing videos to expand audience reach and increase play counts.

Emotional effect represents audiences' deeper reactions to video content, involving affective analysis, judgment, and selection. Bilibili provides multiple ways to express emotions, such as liking, commenting, sending danmaku [3], and giving coins to express agreement, disagreement, or neutrality. For operational feasibility, this study does not identify sentiment orientation in comment and danmaku texts, considering only quantitative characteristics.

Attitudinal effect builds upon cognition and emotion, forming habitual responses to specific emotional stimuli. When audiences develop trust toward scientific journal Bilibili accounts, they follow the accounts to receive timely updates, making follower counts a partial reflection of attitudinal effect.

2.2.2 Independent Variables: Communication Subject, Channel, and Content Independent variables include communication subject, communication channel, and communication content, with specific measurement indicators shown in Table 2 .

Table 2: Measurement Indicators for Scientific Journal Video Communication Factors

Factor Category	Indicator	Description
Communication Subject	Integrated Operation	Whether the Bilibili video account operates in an integrated model with multiple journals
	Organizer Type	Type of organizing institution: government agency, enterprise, academic society, university, or research institute
Communication Channel	Account Verification	Whether the account has obtained institutional verification badge through platform review
	Update Frequency	Average monthly video updates per account
Communication Content	Content Theme	Video themes: science popularization, journal promotion, conference clips, or paper recommendations
	Paper Bibliographic Info	Whether video includes paper bibliographic information (title, authors, etc.)
	Number of Tags	Number of tags assigned by publishers to videos
	Self-produced	Whether videos are self-produced
	Subtitles	Whether videos include subtitles
	Video Length	Total duration of videos

Factor Category	Indicator	Description
	Specific Release Time	Specific release time period: morning, afternoon, or evening
	Weekday Release	Whether videos are released on weekdays

The communication subject is the starting point of communication behavior, primarily responsible for content collection, organization, selection, processing, and dissemination [16]. In the narrow sense, the subject is the journal itself; in the broad sense, it is the journal's organizing institution. This study characterizes subject features through "integrated operation" and "organizer type" indicators.

Communication channels are the specific means through which communication activities are realized [16]. Macro channels refer to communication platforms (Bilibili in this study), while micro channels refer to specific intermediaries within platforms, such as journal video accounts. This study focuses on journal account characteristics, including official verification status and video update frequency.

Communication content is the center of communication activities [16], encompassing content features, format features, and release features. Content features include content theme, paper bibliographic information, and number of tags. Format features include self-production, subtitles, and video length. Release features include specific release time and weekday release.

2.3 Sample Selection and Empirical Model

2.3.1 Sample Selection and Data Collection This study selected journals from the "Excellence Action Plan for Chinese STM Journals" (excluding popular science journals) as the research sample. These journals represent high academic quality, significant field influence, and excellent publication standards, serving as outstanding representatives of domestic scientific journals. Using them as a sample not only allows analysis of the current state of video communication among high-level Chinese scientific journals but also provides recommendations for optimizing communication strategies based on revealed influencing factors, thereby further leveraging the leading and demonstrative role of high-quality journal clusters in new media construction.

We conducted individual searches on Bilibili using journal Chinese and English names, verified results, and limited retrieval to "users." After identifying accounts, we used Python and Octoparse to scrape account information and all published video data, including fields such as journal video account name, opening date, follower count, verification badge, total videos in account, video release time, video duration, video tags, play count, danmaku count, like count, coin

count, favorite count, share count, and comment count. Missing data were manually supplemented, ultimately yielding 684 usable video data points from 17 video accounts covering 32 academic journals. Data collection concluded on October 10, 2023.

2.3.2 Empirical Model Before regression, we tested correlations among cognitive, emotional, and attitudinal effects, finding pairwise correlation coefficients all exceeding 0.6. This strong correlation confirms their theoretically gradual accumulation and deepening process, validating indicator selection rationality. We then used the Analytic Hierarchy Process and expert consultation to weight the three effect indicators: cognitive effect (0.48), emotional effect (0.25), and attitudinal effect (0.27)[1]. Based on these weights, we calculated comprehensive communication effect scores as the dependent variable in our regression model. Finally, we employed multiple linear regression to analyze how communication subject, channel, and content affect communication effects[2]. Multiple linear regression, based on rigorous mathematical and statistical theory, is a mature analytical method capable of revealing relationships between dependent and multiple independent variables.

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3. Results

3.1 Descriptive Statistics

3.1.1 Dependent Variable Characteristics The 684 data points in this study involve 17 video accounts and 32 scientific journals, detailed in Table 3 .

Table 3: Basic Information of Scientific Journal Bilibili Accounts

Bilibili Account Name	Journals Covered	Video Count
China Laser Press	6	...
Science China Press	10	...
Acta Automatica Sinica JAS	2	...
Bulletin of Chinese Academy of Sciences	1	...
...	...	...

Descriptive statistics for the 684 videos across cognitive, emotional, and attitudinal effect indicators reveal the communication effectiveness of scientific journal videos on Bilibili (see Table 4). At the cognitive level, play counts are relatively substantial, mostly distributed between 10 and 1,000, while share and favorite counts concentrate at 10 or fewer. At the emotional level, most videos receive fewer than 10 likes, comments, danmaku, and coins. At the attitudinal level, over half of the accounts have more than 1,000 followers. Overall, scientific

journal video audiences are receptive to content and show tendencies for continued attention, but are reluctant to express emotions openly on social media platforms, particularly regarding speech publication.

Table 4: Characteristics of Scientific Journal Video Communication Effects (N=684)

Indicator	Distribution
Play count	10-1000: X%, >1000: Y%
Share count	$ $10: X%, 10-100: Y%
...	...

3.1.2 Independent Variable Characteristics Based on previous discussion, independent variables for scientific journal video communication effects include communication subject, channel, and content. Table 5 presents statistical results for the 684 videos across these three dimensions.

Table 5: Characteristics of Scientific Journal Video Communication Factors (N=684)

Factor	Category	Percentage
Communication Subject	Integrated operation	X%
	Organizer type: Government	X%
	Organizer type: Enterprise	X%
	Organizer type: Society	X%
	Organizer type: University	X%
	Organizer type: Research institute	X%
Communication Channel	Account verified	X%
	Update frequency: <1/month	X%
	Update frequency: 1-5/month	X%
	Update frequency: >5/month	X%
Communication Content	Theme: Science popularization	X%
	Theme: Journal promotion	X%
	Theme: Conference clips	X%
	Theme: Paper recommendation	X%
	Includes bibliographic info	X%
	Tags: $ $10	X%
	Self-produced	X%
	Has subtitles	X%
	Length: <10 min	X%
	Length: 10-120 min	X%
	Length: $ $120 min	X%
	Release time: Morning	X%
	Release time: Afternoon	X%

Factor	Category	Percentage
	Release time: Evening	X%
	Weekday release	X%

Regarding communication subject, most video accounts operate under integrated models, and the vast majority of videos belong to journals organized by research institutes, followed by universities. For communication channels, most accounts have obtained Bilibili institutional verification, with nearly half updating between 1-5 videos monthly. For communication content, most videos focus on paper recommendations, followed by academic conference clips, journal promotion, and science popularization. Over half include specific bibliographic information. More than half have 10 or fewer tags. Self-produced and non-self-produced (screen recording) videos are roughly equal. Most videos lack subtitles and are under 10 minutes long. Nearly half are released in the afternoon, followed by morning releases, with the vast majority published on weekdays.

3.2 Regression Analysis Results

We conducted multiple linear regression analysis using Stata. Variance inflation factor (VIF) tests yielded values all below 5, indicating no high multicollinearity. Considering potential heteroskedasticity, we used robust standard error estimation for more reliable results [17]. Regression results appear in Table 6 .

Table 6: Regression Results for Factors Influencing Scientific Journal Video Communication Effects on Bilibili

Variable	Coefficient (Robust SE)
Integrated operation	0.072*** (0.013)
Organizer type = Enterprise (ref: Government)	-0.120*** (0.017)
Organizer type = Society	0.085*** (0.019)
Organizer type = University	-0.076*** (0.016)
Organizer type = Research institute	-0.084*** (0.016)
Content theme = Journal promotion (ref: Science popularization)	0.077*** (0.014)
Content theme = Conference clips	0.033*** (0.002)

Variable	Coefficient (Robust SE)
Content theme = Paper recommendation	0.034** (0.012)
Includes bibliographic info	(0.010)
Number of tags	-0.002** (0.006)
Self-produced	(0.001)
Has subtitles	0.013*** (0.004)
Video length	(0.000)
Release time = Afternoon (ref: Morning)	(0.004)
Release time = Evening	0.035*** (0.007)
Weekday release	-0.043* (0.017)
Constant	
Adjusted R^2	

Note: p<0.05, ** p<0.01, *** p<0.001.*

(1) Impact of Communication Subject

Table 6 shows that integrated operation significantly positively affects journal communication effectiveness, indicating advantages in multi-joint journal video account operation. Integrated operation enables resource sharing, allowing different journals to collaboratively plan, produce, and promote videos, collectively improving content quality and expanding user reach through joint promotion.

Organizer type results show that society-organized journals achieve the best video communication effectiveness. As professional organizations in specific disciplines, societies possess deep academic influence, excellent resource integration capabilities, and extensive information exchange networks, significantly enhancing journal video promotion effectiveness.

(2) Impact of Communication Channel

Results show that obtaining Bilibili verification significantly positively affects communication effectiveness. Verified accounts enjoy comprehensive services in copyright protection and search optimization [18]. Enhanced authority and credibility, increased recommendation weights, and greater exposure opportunities all contribute to improved video communication effectiveness.

Increased video update frequency also significantly positively affects communication effectiveness. High-frequency updates not only maintain account activity and satisfy user demand for fresh content but also align with platform recommendation algorithms, effectively increasing user stickiness and promoting video

communication effectiveness.

(3) Impact of Communication Content

Regarding content themes, conference clip videos demonstrate significantly superior communication effectiveness compared to science popularization, journal promotion, and paper recommendation themes. Conferences gather the latest field developments and trends, with related clips possessing strong timeliness, interactivity, and live presence. This barrier-free conference experience attracts numerous users interested in professional fields on Bilibili.

Increased video tag numbers significantly negatively affect communication effectiveness. Excessive tags may hinder platform recommendation algorithms from accurately judging video content, reducing recommendation precision and affecting video exposure rates. Videos with subtitles show significantly better communication effectiveness. Compared to audio and visual information alone, text assists in content expression, enhances communication accuracy and comprehensibility, and optimizes user viewing experience.

Videos released on weekdays show significantly better communication effectiveness. Users have higher demand for scientific journal video content on weekdays and are more likely to watch professional knowledge content. Additionally, whether videos include paper bibliographic information, are self-produced, video length, and specific release time periods show no significant effects on communication effectiveness.

To test robustness, we recalculated communication effect weights using the entropy method, obtaining new weights of 0.37, 0.36, and 0.27 for cognitive, emotional, and attitudinal effects[3]. Using these weights to recalculate comprehensive scores and re-running regression analysis yielded results largely consistent with main regression results, confirming robustness.

Based on these findings, we summarize the influencing factor model for journal video communication effectiveness in Figure 2 [Figure 2: see original paper], providing clear and powerful guidance for discussing improvement strategies in the following section.

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4. Strategies for Improving Communication Effectiveness

4.1 Communication Subject: Collaborative Operation and Resource Mobilization

(1) Encourage Scientific Journals to "Huddle Together for Warmth"

Among our sample, integrated operation accounts include Acta Automatica Sinica JAS, China Laser Press, and Science China Press. Acta Automatica Sinica JAS integrates 2 journals, China Laser Press integrates 6 journals, and

Science China Press integrates 10 journals. Empirical findings show that integrated accounts achieve better communication effectiveness, indicating that clustering advantages exist in video communication. Therefore, for journals with existing but poorly performing video accounts, we recommend adopting a "huddle together for warmth" strategy by appropriately abandoning poorly performing accounts and collaborating with other journals in the same field to build and operate new shared accounts, collectively improving video content quality and leveraging broad, stable audience group advantages to enhance account influence. For journals currently without video accounts, we recommend initial collaborative models, jointly creating and operating video accounts with other journals under the same organizer to avoid initial "solo struggle."

(2) Strengthen Resource Mobilization by Organizing Institutions

Communication effectiveness varies across different organizer types, with society-organized journals performing best. In our sample, the Chinese Society of Theoretical and Applied Mechanics and the Chinese Society for Electrical Engineering performed excellently, with their video accounts (Acta Mechanica Sinica and *Proceedings of the CSEE*) each having approximately 20,000 followers on Bilibili, with average play counts of 13,300 and 2,700 respectively. As academic organizations, societies gather experts and scholars in specific fields and build academic exchange platforms. Their advantage lies in aggregating domain researchers who are potential high-quality followers for journal Bilibili accounts. Organizing institutions should coordinate communication strategies [19] and fully mobilize internal and external resources to support journal video communication, such as inviting enterprise video operation experts for training, conducting video production workshops, and promoting video accounts at academic events to effectively convert expert resources into journal video followers.

4.2 Communication Channel: Credibility and Activity

(1) Enhance Account Credibility

Verified institutional accounts achieve better communication effectiveness. In our sample, verified accounts such as *Bulletin of Chinese Academy of Sciences* and Acta Mechanica Sinica (English edition) demonstrate stronger credibility and better communication effectiveness. Therefore, we recommend journals upload institutional qualification materials to complete verification during account registration, establishing a foundation for broad audience recognition. For verified accounts, this status can be highlighted in video descriptions to emphasize official identity and enhance audience trust. Additionally, Bilibili account links can be provided on other platforms and occasions such as institutional websites, WeChat official accounts, and academic conferences to further consolidate and publicize the official status of video accounts.

(2) Maintain Moderate Activity Levels

Increased video update frequency promotes communication effectiveness. We

recommend scientific journals regularly update video content after opening accounts to maintain activity. Journals can develop video update plans including dates and content to ensure both frequency and quality. These plans can be released in advance to enhance audience anticipation and cultivate stable follower groups. Update plans should be adjusted according to academic dynamics to launch videos related to current academic hotspots, increasing content timeliness.

4.3 Communication Content: Branding, Precision, and Tactical Optimization

(1) Build Content Brands

Different content themes yield varying communication effectiveness, with conference clips performing best. We recommend scientific journals focus on this advantageous theme to build distinctive academic conference video brands. Actively excavate exciting conference content such as expert panel discussions and frontier trend interpretations, transforming them into high-quality videos through secondary planning and meticulous production for broad online dissemination. To optimize user experience, interactive modules such as Q&A and discussion sections can be set up below videos to encourage user participation, forming a virtuous cycle of knowledge sharing and feedback. Additionally, small online academic conferences can be organized for Bilibili users, inviting renowned experts for live streaming and in-depth interaction to optimize online academic conference experiences.

(2) Deliver Precise Content

Empirical findings show that increased tag numbers negatively affect communication effectiveness, while adding subtitles positively affects it—both related to precise content delivery. Regarding tags, our sample shows journal video tag counts ranging from 3 to 25. More tags typically indicate broader themes. However, for academic journal video users with specific domain knowledge, thematic precision often matters more than breadth. Therefore, we recommend scientific journals appropriately control tag numbers when uploading videos to Bilibili, selecting tags highly relevant to content that accurately describe video themes to improve search probability by target users and matching with algorithm-recommended users. Journals can reference tag cases from outstanding similar videos or understand user search habits and preferences through surveys and comment interactions to comprehensively optimize tag selection strategies. Regarding subtitles, we recommend adding subtitles during video production through professional software for speech-to-text conversion or manual input to assist user comprehension, reduce misunderstandings, and optimize viewing experience.

(3) Optimize Distribution Tactics

Empirical findings show that videos released on weekdays achieve better com-

munication effectiveness. We recommend journals optimize distribution tactics according to user browsing habits. First, establish fixed release schedules, such as releasing new videos at specific times on weekdays, to cultivate user viewing habits and anticipation. Second, adopt preview models by releasing preview information through social media platforms before video publication to guide audience attention and increase initial play counts. Third, implement cross-platform distribution by simultaneously promoting videos across major social media platforms including Bilibili, WeChat Channels, Toutiao, Weibo, and Douyin to broaden communication reach. Finally, regularly analyze video viewing data to evaluate strategy effectiveness and make timely adjustments for continuous communication improvement.

5. Conclusion

Scientific journal video communication represents both an innovation need in the media convergence era and a necessary measure for building world-class journals [20]. This study conducted in-depth investigation of scientific journals' communication data on Bilibili, empirically examining influencing factors based on a constructed theoretical framework. We identified multiple specific factors across communication subject, channel, and content dimensions, proposing actionable strategic recommendations to support Chinese scientific journals' new media convergence and knowledge service effectiveness improvement.

This study has several limitations. First, the sample includes only Excellence Action Plan journals, which may not fully represent the overall situation of Chinese scientific journal videos. Second, all communication effect and influencing factor indicators are selected based on Bilibili characteristics, requiring new indicators when applying this research framework to other video platforms. Finally, platform features and audience groups vary across platforms, so our conclusions apply specifically to scientific journals operating Bilibili accounts. Future research will expand journal sample sizes, broaden social media platform investigation scope, and conduct comparative analysis and in-depth exploration of communication effects and influencing factors across different platforms.

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Author Contributions

Ying Zhang: Conceptualized the research, analyzed data, wrote and revised the manuscript.
Guoyuan Tang: Proposed the research topic, designed the framework, wrote and revised the manuscript.
Liangping Ding: Data cleaning.
Hejia Xie: Data collection.
Nan Zhou: Data collection.
Wei Wang: Data collection.

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Conflict of Interest: The authors declare no conflict of interest.

Notes:

[1] We invited seven experts to pairwise compare the importance of cognitive, emotional, and attitudinal effects. Consistency ratios (CR) were 0.063, 0.097, 0.071, 0.003, 0.063, 0.013, and 0.069, all $ $0.1, passing consistency tests and confirming result acceptability.

[2] We controlled for Excellence Action Plan funding amounts and days since video publication to eliminate interference with research objectives.

[3] Using the entropy method, cognitive, emotional, and attitudinal effects yielded entropy values of 0.633, 0.642, and 0.731, with difference coefficients of 0.367, 0.357, and 0.269, respectively.

Note: Figure translations are in progress. See original paper for figures.