Study on the Causal Factors of the Information Cocoon in Secretarial Work from the Perspective of S-O-R Theory

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Abstract: This study analyzes the formation mechanism, causal factors, and resolution paths of the information cocoon in secretarial work from the perspective of S-O-R theory. Through literature review and empirical analysis, it is found that at the Stimulus dimension, information overload, single information channels, and institutional constraints lead to path dependence in secretaries' information input; at the Organism dimension, cognitive biases such as reliance on experience and emotional changes such as information-overload anxiety cause secretaries to depend on information within their comfort zone; at the Response dimension, there is a dual solidification effect of positive behaviors (e.g., channel solidification, reuse of historical data) and negative behaviors (e.g., resistance to heterogeneous information). These interacting factors form a vicious cycle of "environmental stimulus –cognitive solidification – behavioral rigidity." Based on this, three-dimensional strategies to break the cocoon are proposed: building cross-department information-sharing platforms to optimize the stimulus environment; promoting cross-disciplinary learning and psychological incentive mechanisms to enhance individual response capabilities; and facilitating behavioral transformation through cross-departmental information-rotation mechanisms while jointly optimizing the organizational information environment. The findings provide theoretical support and practical guidance for improving secretarial work efficiency and strengthening its role as an information hub in the context of digital transformation.

1. Introduction

According to the 55th Statistical Report on Internet Development in China released in Beijing by the China Internet Network Information Center (CNNIC), as of December 2024, the number of internet users in China reached 1.108 billion, an increase of 16.08 million compared to the same period the previous year, with an internet penetration rate of 78.6%[1]. The rapid increase in internet users and the surge of information have altered traditional information patterns, propelling the transition from the "Information Age" to the "Intelligent Age." The explosion of data brought by internet development has further exacerbated the issue of information overload. Due to users' limited capacity to process information, they tend to selectively focus on content that is interesting or perceived as useful in order to reduce cognitive burden, gradually forming a closed information

environment akin to a silkworm cocoon—known as the information cocoon phenomenon[2]. In the era of big data, the overflow of diverse media information has turned negative phenomena such as information cocoons into focal points of academic research. Since information work lies at the core of secretarial functions, the prominence of the information cocoon phenomenon in secretarial tasks introduces new challenges and adversely affects work quality and efficiency.

This study adopts the Stimulus–Organism–Response (S-O-R) theory as its analytical framework, integrating it into the investigation of information cocoons in secretarial work. It analyzes the causal factors behind the information cocoon from three dimensions: stimulus, organism, and response. The core aim of this inquiry is to provide a theoretical foundation for breaking through the information cocoon and enhancing the efficiency of secretarial work, while also offering a novel theoretical perspective for understanding information processing issues within the secretarial profession.

2. Literature Review

In 2006, the renowned American scholar Cass R. Sunstein posited that in Western political contexts, social phenomena such as information narrowing and group polarization are prone to emerge. He referred to this distinctive social condition as the "information cocoon," and proposed a three-stage evolutionary model comprising information narrowing, group polarization, and the formation of the information cocoon [3]. A review of relevant literature reveals that the information cocoon has become a focal point of scholarly attention in the fields of journalism, communication, and information management. Existing studies primarily concentrate on three dimensions: the causes of the information cocoon, its implications, and strategies for its mitigation. Chen Changfeng argued that the information cocoon is a phenomenon unique to the Western political context, and that many foreign scholars have misinterpreted the concept by taking it at face value, thereby distorting its original meaning [4]. In contrast, Peng Lan maintained that although the information cocoon is a novel concept and research hotspot, the social issues it reflects—such as the narrowing of users' information horizons and group entrenchment—have long existed. She further emphasized that optimizing algorithms and reforming the information supply side are key to dismantling the cocoon effect [5]. Zhang Hai contended that the information cocoon is indeed a real phenomenon whose negative implications outweigh its benefits; although it has some merit in fulfilling users' personalized information needs, it also leads to undesirable social consequences such as information narrowing and group polarization [6]. Through long-term observation and empirical studies, Nadine et al. demonstrated that the information cocoon phenomenon within Western political contexts exerts a significantly detrimental impact on public cognition and democratic politics [7]. Zuiderveen et al., however, expressed skepticism about the existence of the information cocoon, arguing that such a phenomenon requires stringent conditions to materialize and is unlikely to occur in the real world. They asserted that it is virtually impossible for the public to completely avoid exposure to dissenting views [8].In addition, a comparative review of domestic and international literature reveals distinct differences in research foci. Western scholars tend to concentrate on more specific phenomena such as echo chambers, filter bubbles, information narrowing, and selective exposure. In contrast, Chinese scholars directly adopt the concept of the information cocoon as the central object of inquiry, delving into its relationship with social context, algorithmic mechanisms, and informational ecology. The above analysis indicates that the information cocoon has become a prominent research topic for scholars both in China and abroad. However, most of the existing studies adopt a qualitative approach grounded in social phenomena and lack sufficient quantitative empirical evidence. Moreover, discrepancies in how Chinese and Western scholars conceptualize the information cocoon may give rise to communication barriers across academic communities. In light of this, the present study examines how secretarial personnel selectively access information during their work, aiming to

elucidate the underlying causes and operational logic of the information cocoon in the context of secretarial information processing. By adopting a quantitative research paradigm and conducting empirical investigations, this study not only facilitates convergence between Chinese and Western scholarly perspectives on the information cocoon but also helps address the current deficit in empirical research on the topic.

3. S-O-R Theory and the Information Cocoon in Secretarial Work

The Stimulus–Organism–Response (S-O-R) theory, a foundational framework in environmental psychology, offers an effective explanatory lens for understanding phenomena in the field of information behavior. This model comprises three dimensions: the stimulus dimension serves as the triggering mechanism and includes both objective external environmental elements—such as technological features and social context—and subjective internal driving forces—such as emotional states and cognitive patterns. Depending on the research context, scholars have further categorized these into systemic versus situational stimuli, or individual traits versus economic factors. The organism dimension represents the multidimensional internal evolution of an individual in response to external stimuli. This internal transformation encompasses not only fluctuations in emotional attitudes and the restructuring of cognitive schemas, but also complex interactions involving physiological arousal and psychological adjustment. The response dimension captures the final behavioral manifestations that result from the synergistic interplay between the stimulus and organism, typically polarized into two categories: active approach behaviors and passive avoidance behaviors.

By revealing the causal chain of "environmental stimulus – psychological mediation – behavioral output," the S-O-R theory serves as an effective analytical tool for examining system acceptance, user information-seeking patterns, and decision-making mechanisms in crisis contexts. The theory has been widely applied in the field of information management, particularly for interpreting user behavior in information systems and context-specific information activities. Its scope has extended to frontier areas such as social media interaction, intelligent technology adoption, and online information avoidance, thereby deepening our understanding of human information behavior mechanisms in digital environments.

The information cocoon refers to a phenomenon in which an individual's intake of information becomes narrowed and viewpoints become entrenched due to selective exposure, cognitive biases, and environmental constraints during information acquisition and processing. In the context of secretarial work, this phenomenon intersects with the professional characteristics of the role and manifests in complex ways: Stimulus dimension: Due to closed information systems, fixed task requirements, and institutional constraints, secretarial information input channels are prone to forming path dependence, characterized by excessive reliance on commonly used systems by superiors and historical templates, and a lack of motivation to engage with cross-domain information sources. Organism dimension: Long-term exposure to homogeneous information stimuli triggers both cognitive and emotional solidification. On one hand, it fosters an "empiricist cognitive schema," wherein secretaries habitually apply past cases to new problems, suppressing innovation. On the other hand, the pressure of information overload induces passive psychological defense mechanisms—such as filtering unfamiliar sources and simplifying processing procedures—to reduce cognitive burden, thereby reinforcing reliance on the "comfort zone." Response dimension: These internal transformations externally manifest as two types of behavior. Active responses appear as channel fixation and rigid processing modes, forming an implicit "information comfort zone." Passive responses include the active exclusion of heterogeneous information and avoidance of cross-department collaboration, leading to an explicit "information contact gap."

These manifestations can trap secretarial work in a cycle of transactional repetition, where excessive time is spent handling similar documents and the frequency of proposing innovative suggestions declines markedly compared to the initial stages of employment. More seriously, this may introduce systemic risks in decision support. For instance, when 70% of decision references stem from leadership directives, a secretary's sensitivity to changes in industry policies and competitor trends is diminished, resulting in "blind spots" in information judgment. One illustrative case involves a secretary in a large enterprise who overlooked anomalies in cross-departmental data and delayed a major risk warning by three weeks, leading to financial losses exceeding ten million yuan—an incident that underscores this dynamic. Ultimately, the vicious cycle of "information narrowing – cognitive solidification – behavioral rigidity" arises from the long-term interaction between the information hub function and the service-execution nature of the secretarial role. Breaking this cycle requires multidimensional interventions, including optimizing system architecture, enhancing cognitive capacities, and refining incentive mechanisms.

4. Indicator System Construction and Research Design

4.1 Indicator System Construction

Drawing on the Stimulus–Organism–Response (S-O-R) theoretical framework and incorporating the key characteristics of information behavior in secretarial work, this study constructs an indicator system for analyzing the causal factors of information cocoon formation in the secretarial context, as detailed in Table 1.

The Information Environment Trigger Mechanism (S) refers to factors that promote or hinder secretaries' selective exposure to information in the workplace. Generally, these factors are divided into internal and external stimuli. Based on existing multidimensional classification systems in the literature—such as systemic vs. situational stimuli or individual traits vs. economic factors—and in light of the typical features of secretarial information behavior, this study selects three indicators: objective external environment, task scenario elements, and internal driving forces. These are used to explore how stimulus factors influence the formation of information cocoons in secretarial work, considering the characteristics of both the information environment and the cocoon effect. The Individual Response Mechanism (O) refers to the changes that occur within an individual under the influence of stimulus factors. This internal transformation involves not only fluctuations in emotional attitudes and the restructuring of cognitive schemas, but also complex interactions between physiological arousal and psychological adjustment. In the formation process of the information cocoon, secretaries typically experience changes across emotional, cognitive, and psychophysiological dimensions. Therefore, this study selects three corresponding indicators: evolution of emotional attitude, reconstruction of cognitive schemas, and psychophysiological interaction, to analyze the impact of organism-related factors on the cocoon formation process in secretarial work. The External Behavioral Manifestation of the Cocoon Effect (R) refers to the actions taken by individuals under the combined influence of stimulus and organism factors. These behaviors are generally categorized into two types: active approach behaviors and passive avoidance behaviors. Approach behaviors reflect positive adoption and sustained action, leading to implicit cocoon formation; avoidance behaviors reflect passive usage or disengagement, resulting in explicit cocoon expression. In secretarial work, the formation of the information cocoon results from the combined effect of both types—approach behavior as the latent construction process, and avoidance behavior as its overt manifestation. Centering on the S-O-R theory and aligning with the specific characteristics of information processing, task scenarios, and professional requirements in secretarial work, this study systematically constructs an evaluation framework for the information cocoon. The research design and analysis are carried out around the dual behavioral categories of approach and avoidance.

Table 1　Indicator System for Analyzing the Causal Factors of Information Cocoon Formation in Secretarial Work

Primary Indicator	Secondary Indicator	Indicator Description
Information Environment Trigger Mechanism (S)	Systemic Triggers (Objective External Environment)	Singularity of Information Channels (Dependence on internal systems / Coverage of external information sources)
		Information System Closure (Platform compatibility / Data interoperability rate)
		Information Overload Pressure (Average Daily Document Processing Volume / Frequency of Emergency Information Response)
	Situational Triggers (Task Scenario Elements)	Degree of Task Specialization (Proportion of specialized tasks / Volume of integrated coordination tasks)
		Physical Space Closure (Rate of independent office settings / Frequency of cross-departmental collaboration)
		Confidentiality Requirements (Exposure to sensitive information / Restrictions on access to public information)
	Individual Trait Triggers (Subjective Internal Drives)	Experience Reliance (Reuse rate of historical cases / Frequency of applying critical thinking)
		Information Risk Aversion (Aversion to unfamiliar sources / Adherence to familiar domains)
		Service Orientation Bias (Response speed to leadership demands / Attention to global information)
Secretary's Individual Response Mechanism (O)	Emotional Attitude Evolution	Information Overload Anxiety (Pressure from unread email handling/Irritation caused by redundant information)
		Cognitive Fatigue Index (Rate of attention decline after continuous information processing)
		Information Filtering Preference (Dependence on text documents / Rejection of multimedia information)
	Cognitive Schema Reconstruction	Professional Domain Rigidity (Depth of core business knowledge / Investment in interdisciplinary learning)
		Reliance on Linear Thinking (Proportion of procedural processing / Deficiency in systematic analysis)
		Blind Spot in Crisis Anticipation (Sensitivity to peripheral information / Delay in identifying potential risks)

		Neural Stress Indicator (Amplitude of heart rate fluctuation during high-frequency information processing)
	Psychophysiological Interaction	Motivational Decline Rate (Decrease in willingness to process innovative information as tenure increases)
		Cognitive Dissonance Recovery (Time needed to revise judgments when encountering conflicting information)
External Behavioral Manifestation of the Cocoon Effect (R)	Positive Approach Behaviors (Implicit Cocoon Formation)	Biased Information Filtering (Frequent attention to high-focus domains / Neglect of peripheral information)
		Historical Data Reuse Rate (Frequency of referencing past documents / Speed of assimilating new regulations)
		Channel Locking Effect (Duration of use on a single platform / Frequency of multi-channel switching)
	Negative Avoidance Behaviors (Explicit Cocoon Manifestation)	Complex Information Rejection (Aversion to multi-source data integration tasks / Preference for simplified processing)
		Feedback Path Rigidity (Use of fixed reporting templates / Lack of personalized analytical content)
		Decline in Learning Willingness (Participation rate in training programs / Delay in adopting new technologies)

4.2 Research Design

The questionnaire design adopts the S-O-R (Stimulus–Organism–Response) theory as its conceptual framework. According to this theory, individual behavior constitutes the terminal response of the organism to external stimuli. Within the context of information cocoon research, S-O-R theory provides a logical pathway for analyzing the formation mechanisms of the information cocoon in secretarial work—namely, the external information environment constitutes the "stimulus," the internal changes within secretaries constitute the "organism response," and the observable behavioral patterns form the "response." According to Uses and Gratifications Theory, individuals' behavior is goal-directed, with a tendency to choose stimuli that satisfy their intrinsic needs. Therefore, this questionnaire is structured around the three dimensions of the S-O-R model, deconstructing behavioral logic and layering question items to enable a systematic assessment of the information cocoon phenomenon.

In the Stimulus Dimension (Information Environment Trigger Mechanism), items such as "information system closure" and "confidentiality requirements" are used to quantify how objective environmental constraints (e.g., technical limitations, task attributes) and subjective internal factors (e.g., experience reliance, service-orientation bias) restrict the scope of information accessible to secretarial staff. This design aligns with the theoretical positioning of stimulus as the initiating factor of behavior. In the Organism Dimension (Secretary's Individual Response Mechanism), items such as "information overload anxiety" and "cognitive schema reconstruction" are employed to assess

internal changes in secretaries at the emotional, cognitive, and psychophysiological levels. These responses reflect the processing and transformation of external stimuli by the organism. In the Response Dimension (External Behavioral Manifestation of the Cocoon Effect), items such as "channel locking effect" and "complex information rejection" record both positive approach behaviors (e.g., reliance on fixed information channels) and negative avoidance behaviors (e.g., filtering out unfamiliar information), corresponding to the theory's concept of behavioral valence polarization.

Peng Lan and Zhang Hai have previously noted that information interest preferences may lead to "information dietary bias" among users[9]. Building on this insight, the present design expands the analytical scope by incorporating question items that span all dimensions of the S-O-R model. These items not only capture explicit manifestations of the information cocoon (e.g., "filtering unknown senders") but also uncover latent formation processes (e.g., "historical data reuse rate"). The diversity of question formats enables the integration of data analysis and causal exploration, thereby validating the theoretical hypothesis that "stimuli trigger cocoon behaviors through organismal response." At the same time, the design provides empirical support for identifying unique causes of the information cocoon in secretarial work—such as confidentiality constraints and service orientation toward leadership—and lays a practical foundation for intervention strategies, including information system optimization and the realignment of training programs.

5. Data Collection and Analysis

The questionnaire for investigating the causal factors of information cocoon formation in secretarial work was developed with reference to well-established scales and empirical studies both domestically and internationally. The instrument is structured into three sections: The first section provides an introduction to the research content and outlines the basic information about the questionnaire; the second section collects respondents' demographic data, including gender, age, educational attainment, and other relevant indicators; the third section constitutes the main body of the survey, focusing on the formation mechanisms and influencing factors of the information cocoon specific to secretarial work. This section was tailored to reflect the characteristics of information behavior in secretarial roles and includes three core dimensions, twelve secondary indicators, and twenty-six tertiary measurement items, of which four are open-ended questions. The scale employs a five-point Likert format, with responses ranging from 1 ("strongly disagree") to 5 ("strongly agree"), where higher scores indicate a greater level of agreement.

After conducting a preliminary survey, ambiguous or potentially misleading statements in the scale were revised based on reliability and validity testing, leading to the finalization of the formal questionnaire. Due to practical constraints, the survey was administered in online format via the Wenjuanxing platform. Only respondents with verified secretarial work experience were permitted to complete the survey. Questionnaires that were completed in an unrealistically short amount of time, exhibited internal inconsistencies, or demonstrated response homogeneity were excluded from the dataset, ensuring that only valid responses were retained for analysis.

5.1 Reliability Analysis of the Scale

The scale validation process includes both reliability and validity analyses. Reliability analysis is conducted to assess the internal consistency and stability of the scale items. In this study, Cronbach's α coefficient was used as the reliability metric. As shown in Table 2, the α coefficients for all dimensions exceed the threshold of 0.7, with the "Emotional Attitude Evolution" dimension surpassing 0.8, indicating high reliability. Several other dimensions exhibit α values approaching 0.7. After item refinement, reliability further improved, demonstrating strong internal consistency among

the scale items and confirming that the measurement results are stable and trustworthy.

The reliability coefficients for all core variables reached acceptable levels, indicating that the scale is suitable for quantitative research on the information cocoon phenomenon in secretarial work. Notably, the "Cognitive Schema Reconstruction" dimension displayed particularly high stability.

Table 2 Reliability Analysis of the Scale

Variable Dimension	Cronbach's α	Reliability Evaluation
Systemic Triggers (Objective Environment)	0.75	Good (0.7 < α < 0.8)
Situational Triggers (Task Context)	0.71	Good (0.7 < α < 0.8)
Individual Trait Triggers (Subjective)	0.76	Good (0.7 < α < 0.8)
Emotional Attitude Evolution	0.83	High (α > 0.8)
Cognitive Schema Reconstruction	0.79	Good (0.7 < α < 0.8)
Psychophysiological Interaction	0.71	Acceptable (α > 0.7)
Positive Approach Behaviors (Implicit)	0.73	Acceptable (α > 0.7)
Negative Avoidance Behaviors (Explicit)	0.74	Acceptable (α > 0.7)

5.2 Discussion and Analysis

Table 3 Questionnaire Data Summary

Question Description	Data Summary
Dependence on internal systems (e.g., OA, secretary platforms) (1–10, 10 = extreme dependence)	High dependence (≥7 points): 75%
Stress caused by daily information processing (1–9, 9 = extreme stress)	Moderate to high stress (≥6 points): 70%
Avoidance of external information due to confidentiality requirements (1–9, 9 = always)	Avoidance score ≥7: 68%
Frequency of fatigue from information processing (1–9, 9 = frequent fatigue)	Fatigue score ≥7: 68%
Degree of reliance on templates/past cases (1–10, 10 = full reliance)	Reliance score ≥7: 78.3%
Frequency of prioritizing leadership needs over overall information (1–9, 9 = always)	Priority score ≥8: 80%
Daily working hours on a fixed platform (scale: ≤2h, 2–4h, 4–6h, 6–8h, ≥8h)	≥4 hours (5–9 points): 63%
Willingness to handle multi-source integration tasks (1 = very willing, 9 = strongly unwilling)	Rejection score ≥7: 38%
Instances of delayed risk warnings due to cocooning in the past year (scale: 0, 1–2, 3–5, ≥6 times)	Delay ≥3 times (5–7 points): 45%

Based on the data in Table 3, the key role of the Stimulus Dimension (S) is reflected as follows: survey results indicate that "singularity of information channels", characterized by a high dependence on internal systems, and "information overload pressure" are the primary triggering factors. This aligns with previous literature findings, which suggest that "technological closure" and "information explosion" drive the narrowing of information exposure. In addition, "confidentiality requirements" lead secretaries to proactively avoid external information sources. This finding expands the traditional understanding of institutional constraints in the formation of information cocoons by revealing an occupationally specific dynamic unique to the secretarial profession.

The Organism Dimension (O) serves as a mediating mechanism: data show that the "cognitive

fatigue index" of secretaries is strongly associated with "information overload anxiety." Prolonged exposure to information-processing pressure increases reliance on past experience, resulting in a tendency toward template-based processing—a pattern observed in 78.3% of respondents—gradually forming an "information comfort zone." This conclusion supports Peng Lan's theory that "cognitive bias accelerates cocoon formation." Moreover, the study identifies a secretarial-specific cognitive driver of cocooning: a pronounced "service orientation bias" wherein secretaries prioritize meeting leadership needs over acquiring holistic or strategic information.

The Response Dimension (R) reveals pronounced behavioral rigidity: more than 60% of secretaries work over four hours daily on the same digital platform, and nearly 40% reject tasks involving multi-source data integration. These behaviors reflect both positive dependence on fixed information channels and negative avoidance of complex information. An illustrative case—where a secretary in a corporate setting delayed a risk warning due to a rigid feedback mechanism—corroborates the data findings and clearly demonstrates the evolutionary trajectory of the information cocoon: from the narrowing of information reception to decision-making errors. Compared with the general population, the formation of the information cocoon among secretaries is more strongly influenced by the high degree of specialization inherent in their professional tasks.

6. Conclusion and Coping Strategies

Based on the S-O-R theoretical framework, the formation of information cocoons among secretarial personnel can be analyzed across three dimensions: At the environmental (stimulus) level, factors such as information overload, channel singularity, and institutional constraints lead secretaries to adopt habitual and fixed patterns of information intake. At the individual (organism) level, cognitive biases and emotional fluctuations cause secretaries to prefer familiar information while exhibiting reluctance to explore unfamiliar domains. At the behavioral (response) level, the coexistence of positive behaviors—such as reliance on historical data and fixed channels—and negative behaviors—such as resistance to complex information and ineffective feedback—jointly reinforces the information cocoon. These factors form a cyclical pattern in which environmental stimuli shape cognition, and cognition in turn leads to behavioral rigidity. The root cause lies in the dual nature of the secretarial role, which demands both intensive information processing and the execution of concrete administrative tasks.

Therefore, intervention strategies should be advanced along the three dimensions of the S-O-R framework: At the stimulus level, establishing cross-departmental information-sharing platforms can reduce reliance on single-source systems and help mitigate information overload. At the organism level, fostering interdisciplinary knowledge learning can break through professional silos, while the development of psychological adjustment and incentive mechanisms can enhance secretaries' cognitive capacity for information processing. At the response level, promoting proactive information-handling behaviors can prevent the implicit formation of information cocoons. Additionally, implementing rotational assignments across departments can alter passive avoidance behaviors and facilitate interdepartmental information flow. Moreover, it is imperative to optimize the organizational information environment by clearly delineating the boundaries between public and sensitive information. Under the condition of regulatory compliance, access to external information in non-confidential domains should be appropriately expanded. Collectively, these strategies aim to disrupt the fixed "stimulus–organism–response" cycle, strengthen the secretarial role as an information hub in organizational digital transformation, and effectively dismantle the information cocoon phenomenon.

Acknowledgments

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