Postprint: Emotional Mechanisms in Master's Students' Online Academic Information Seeking Behavior

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Abstract

[Purpose/Significance] This study explores the emotional mechanism in master's students' online academic information seeking behavior to deepen research on emotional issues in information seeking behavior. [Method/Process] Through semi-structured interviews, data on the academic information seeking activities of 25 master's students in online environments were collected, and three-level coding was used to analyze the qualitative data and extract emotional and behavioral characteristics in their information seeking behavior. [Results/Conclusion] During the online academic information seeking process, master's students generate different types of emotional valence and emotional arousal; the former includes positive emotions, neutral emotions, and negative emotions, while the latter includes high arousal, medium arousal, and low arousal. Emotional valence and emotional arousal trigger different types of positive behaviors and negative behaviors.

Full Text

The Emotional Mechanism in Postgraduates' Online Academic Information Seeking Behavior

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Abstract: **[Purpose/Significance]** This study explores the emotional mechanism in postgraduates' online academic information seeking behavior to deepen research on emotional issues in information seeking behavior. **[Method/Process]** Through semi-structured interviews, relevant data on academic information seeking activities of 25 postgraduates in the network

environment were collected, and qualitative data were analyzed using three-level coding to extract emotional and behavioral characteristics in their information seeking behavior. **[Result/Conclusion]** Postgraduates generate different types of emotional valence and emotional arousal during the online academic information seeking process. The former includes positive, neutral, and negative emotions, while the latter includes high, medium, and low arousal levels. Emotional valence and arousal trigger different types of positive and negative behaviors.

Keywords: emotional valence; emotional arousal; information behavior; academic information

2 Literature Review

2.1 Emotional Factors in Information Seeking Behavior

Since the 1980s, researchers have recognized that emotion may be a key factor affecting the information seeking process. T.D. Wilson [14] integrated psychological research on human needs with information seeking behavior, proposing an information seeking behavior model based on individual physiological, emotional, and cognitive needs. B. Dervin [17] analyzed the role of emotion and feeling in sense-making. C.C. Kuhlthau's [13] information search process model also revealed the impact of emotion on user information seeking, assigning thoughts and emotions to various stages of information seeking. Subsequently, with the popularization of computer and internet technology, researchers have paid attention to emotional issues in online academic information seeking behavior. Psychology and cognitive science scholar D. Nahl [15] proposed the social-biological information technology model, which includes dynamic interactions among affect, cognition, and sensation [18]. S.R. Fitzgerald [19] explored how scholars' emotions and temperament affect their willingness to conduct literature searches. F. Aghaei et al. [20] studied students' anxiety in information seeking, finding that topic selection factors significantly influence information seeking anxiety. In China, Cha Xianjin et al. [21] focused on users' academic information seeking behavior in Weibo environments, revealing user attitudes from both cognitive and emotional response perspectives. Liang Zidong [22] found that emotional, cognitive, and behavioral characteristics of student users during academic information seeking are influenced by different factors, with emotional characteristics affected by gender. Jiang Tingting et al. [23] discovered that the complexity of academic information seeking tasks affects user emotions primarily in terms of emotional intensity and duration. Han Zhengbiao et al. [24] studied the relationship among user types, emotional control, mental models, and retrieval performance based on analysis of academic users' information retrieval behavior mechanisms. D. Wu et al. [25] found that both emotions and thinking of university students change with information seeking stages during thesis writing.

2.2 Two-Dimensional Emotion Theory and Information Seeking

Regarding individual information activities, scholars have studied emotional valence, suggesting that positive emotions indicate a favorable information environment [26] and can broaden individuals' cognitive scope [27-29]. Based on this, the mood-as-resource hypothesis [30] proposes that positive emotions help individuals effectively obtain information. However, other research suggests that positive emotions can inhibit information seeking, implying that the current situation is good and no additional information is needed, whereas negative emotions suggest problems exist and prompt individuals to obtain information to solve them [31]. Additionally, negative emotions may produce feelings of uncertainty and confusion [32], while information seeking can alleviate these feelings [33]. Some studies also indicate that negative emotions can inhibit information seeking to reduce emotional costs [34].

Research on emotional arousal in information behavior is relatively scarce [35]. U. Schimmack [36] found that, unlike emotional valence, emotional arousal significantly affects subjects' performance in cognitive tasks. M.M. Nielen et al. [37] argued that both emotional valence and arousal jointly affect early brain processing of words. J.K. Stefanucci et al. [38] demonstrated that emotional arousal can modulate height perception, while emotional valence cannot. Gan Tian et al. [39] found that emotions primarily affect time perception through arousal mechanisms, with subjects perceiving time as significantly longer under high arousal emotions than under low arousal emotions.

Some researchers have explored users' emotional manifestations in information seeking behavior based on valence and arousal dimensions. For example, M. Zhou [40] designed 10 basic emotional vocabulary categories for college students' online information seeking emotional changes, identifying six basic emotions: active-positive, neutral-positive, inactive-positive, active-negative, neutral-negative, and inactive-negative. Qiu Jin and Wu Dan [41] comprehensively examined how collaborative ability and task factors affect users' emotional changes during collaborative information retrieval, dividing emotions into positive, neutral, and negative categories, each further divided into high, medium, and general levels to represent intensity.

2.3 Summary

Existing research has identified the influence of emotional factors on online academic information seeking behavior and integrated emotional factors into online academic information seeking behavior models. However, these studies mostly describe emotions and rarely reveal the specific mechanisms of how emotional factors affect online academic information seeking behavior. Additionally, research on emotional arousal in online academic information seeking behavior is also limited [35]. Therefore, this study combines two-dimensional emotion theory and selects postgraduate students to analyze emotional factors in their online academic information seeking behavior, aiming to more comprehensively

reveal the mechanism of emotional factors in this context.

Specifically, this study focuses on the following research questions: In postgraduates' online academic information seeking behavior, do individuals exhibit different types of emotional valence and emotional arousal? Do different types of emotional valence and arousal affect their online academic information seeking behavior? If so, what effects do emotional valence and arousal have on online academic information seeking behavior?

3 Research Design

3.1 Research Method

This study aims to deeply explore the mechanism of emotional valence and arousal in postgraduates' online academic information seeking behavior and construct a model of postgraduates' online academic information seeking behavior. While quantitative research offers objectivity, rigor, and generalizability, information seeking behavior research ultimately concerns people. The complexity of human behavior and thinking makes many issues impossible to measure clearly through quantitative methods. In contrast, qualitative research's open and flexible stance throughout the research process is more conducive to discovering emotional factors. Therefore, this study selected semi-structured interviews to collect and analyze data from the bottom up, drawing conclusions through three-level coding.

3.2 Research Sample

Regarding data collection, qualitative research emphasizes the richness of research sample data rather than quantity. Therefore, this study focused on diversity in sample data sources, selecting interviewees to cover different dimensions as much as possible (see Table 1). A total of 25 postgraduates were interviewed (four for theoretical saturation testing). Interviews were conducted in June 2018 and January 2019, with samples from Southwest University, Chongqing University, Sichuan University, etc.

One-on-one face-to-face interviews were conducted with 25 postgraduates, averaging about 20 minutes each (interview outline see Table 2). With consent, interviews were recorded and transcribed into text materials. The transcripts and organized materials were returned to respondents for verification to correct errors and omissions.

3.3 Reliability and Validity

This study employed the following methods to ensure reliability: Triangulation (different data collection locations such as Southwest University, Chongqing University, etc.) to ensure data diversity; Using scientific equipment (voice recorders) to record interview data; Confirming recorded content with respondents to clarify their interpretations; Inviting respondents to review synthe-

sized raw materials; Using falsification methods to test new categories developed from coding with other passages from original texts to improve interpretation reliability.

The following methods ensured validity: Constant reflection: Using reflective notes (memos) to maintain sensitivity to existing theories and theories emerging from raw data, capturing new clues to build theory; External review: Sharing research processes and preliminary conclusions with peers and friends to hear their opinions; Participant feedback: Submitting the final theoretical framework to respondents for examination, respecting their opinions, and making necessary modifications; Purposeful sampling: Selecting the most appropriate samples for investigation from research purposes and questions to ensure external validity.

4 Data Analysis

This study analyzed relevant data through three-level coding to extract emotional and behavioral characteristics in postgraduates' online academic information seeking processes. Two researchers completed the entire coding process independently, using constant comparison methods to compare emerging codes and categories with data, testing these codes and categories based on new data, especially data collected according to research purposes. The two coders then discussed different categories until all coding classifications reached agreement. The specific data analysis process was as follows:

4.1 Open Coding

Through open coding, categories developed from coding were constantly compared with other text passages in raw materials to verify interpretation credibility. Since emotional valence, arousal, and seeking behavior characteristics from three different dimensions might coexist in the same data entry, multidimensional information reflected in interview materials (i.e., emotional valence, arousal, and seeking behavior involved in certain data) was simultaneously coded. After multiple rounds of analysis, 55 open codes were formed, and each code was initially conceptualized and summarized into 12 categories (see Table 3), laying the foundation for axial coding.

4.2 Axial Coding

Through axial coding, this study categorized the 12 categories formed by open coding into higher dimensions, ultimately forming four main categories: emotional valence, emotional arousal, positive behavior, and negative behavior. Each main category and its corresponding subcategories are shown in Table 4.

4.3 Selective Coding

Axial coding results showed that the above four main categories were related to postgraduates' academic information seeking behavior, meaning these four main categories could summarize a relatively important core. Therefore, in selective coding, the core category was defined as "postgraduates' academic information seeking behavior." Among them, emotional valence and emotional arousal are internal influencing factors of postgraduates' academic information seeking behavior, affecting their academic information seeking behavior patterns; positive behavior and negative behavior are external manifestations of how emotional valence and arousal affect postgraduates' academic information seeking behavior.

4.4 Theoretical Saturation Testing

Using initially generated theory from materials as further sampling criteria, four additional postgraduates were interviewed after collecting data from 21 respondents to test theoretical saturation. Following the procedural three-level coding approach, these four interview records were randomly selected and coded. Results still conformed to contexts and relationships presented in original theory. Testing revealed no new categories formed, thus determining that research sample saturation had been reached.

4.5 Model Construction and Analysis

Based on Kuhlthau's information search process model and combined with qualitative data analysis results, this study proposes a postgraduates' online academic information seeking behavior model that enriches and improves Kuhlthau's information search process model, as shown in Figure 1.

The information seeking process described in this model shares similarities with Kuhlthau's information search process model, including "initiation," "selection," "exploration," "formulation," "collection," and "presentation." Different from Kuhlthau's model, this model reflects elements such as emotional valence, emotional arousal, positive behavior, and negative behavior in user information seeking behavior based on two-dimensional emotion theory.

The following analysis of Figure 1 combines interview materials.

4.5.1 Emotional Characteristics Postgraduates generate different types of emotional characteristics during online academic information seeking processes. These emotional characteristics are among the internal factors affecting their academic information seeking behavior. This study analyzes their emotional characteristics from two dimensions: emotional valence and emotional arousal.

(1) Emotional Valence. This study found that respondents' emotional valence during information seeking includes positive, neutral, and negative emotions.

Positive emotions emerge during postgraduates' online academic information seeking and help individuals obtain information. For instance, in the "selection stage," they generate positive emotions (increased confidence, reduced negative emotions), which facilitate task initiation: "a01: After understanding the search task, I feel proud and satisfied, more confident, and anxiety decreases." Additionally, in the "formulation stage," positive emotions also emerge (increased confidence, relaxed optimism), prompting deeper search tasks: "a15: I feel very satisfied and happy, which motivates me to search further and increases information seeking enthusiasm." Similarly, L.G. Aspinwall [30] found that positive emotions help individuals take actions aligned with long-term goals and buffer negative information. C.C. Kuhlthau [42] also found that as information seeking progresses and relevant materials are obtained, user emotions change: confidence increases, original uncertainty decreases, satisfaction emerges, and direction becomes clearer.

Regarding neutral emotions, in the "initiation stage," users realize knowledge gaps and generate anxiety or curiosity but haven't identified specific information needs, remaining in problem contemplation and task understanding stages. To solve problems, complete tasks, reduce anxiety, and satisfy curiosity, users consider possible topics and solutions. At this point, due to unfamiliarity with search topics, neutral emotions of "uncertainty" may arise. Such neutral emotions affect postgraduates in two possible ways: They may cause information avoidance behavior: "a03: For unfamiliar topics, I might be curious but also worried about finding inaccurate information. This uncertainty makes me somewhat 排斥, not wanting to search." Conversely, it may promote active information seeking: "a13: Facing unfamiliar topics, I feel a bit anxious and curious, which makes me want to find information more quickly and accelerates my search actions." Comparatively, sample data shows neutral emotions more often cause positive behavior, possibly because postgraduates' academic information seeking is more task-oriented. Even when experiencing uncertainty or unfamiliarity, they continue seeking to achieve task goals. Additionally, users may conduct information seeking to eliminate uncertainty: "a18: I feel very curious, which drives me to more extensively and deeply understand more academic information, stimulating strong 求知欲 and making information seeking a way to satisfy my own information needs."

Negative emotions frequently appear in postgraduates' academic information seeking and affect seeking behavior. For example, in the "exploration stage," users may experience frustration, anxiety, and tension due to inability to accurately express information needs, creating communication barriers with systems: "a04: If I encounter difficulties searching, I get annoyed, anxious, and don't want to search, thinking about doing it later." In the "formulation stage," inability to clarify search goals also generates frustration, anxiety, and tension: "a14: Sometimes I can't find a goal and feel very anxious, which blocks or even crashes the entire information seeking process."

These findings align with many studies. For instance, C.C. Kuhlthau [13] found

that "uncertainty emotions" closely linked to information needs cause user confusion and discouragement, and users also experience uncertainty, frustration, and confusion in initial and exploration stages. I. Arapakis [43] also noted that as search task difficulty increases, user emotions may shift from positive to negative valence.

(2) Emotional Arousal. Besides emotional valence, emotional arousal also affects postgraduates' online academic information seeking behavior, specifically including high, medium, and low arousal states.

High arousal states appear multiple times during information seeking and significantly impact user behavior. For example, in the "initiation stage," if neutral emotions are highly aroused, they may cause negative behavior: "a01: Facing an unfamiliar topic, I feel very nervous and anxious, which may intensify my mood changes and produce other information behaviors, such as avoiding information, modifying search formulas, triggering other behaviors." Similarly, in the "exploration stage," when users cannot accurately express information needs and generate negative emotions, such negative emotions in high arousal states may also negatively affect "formulation stage" behaviors: "a17: If initial search results aren't what I want, I get very annoyed. I value efficiency. When efficiency is low, I get especially annoyed, and then efficiency becomes even lower, making me unable to find search directions." Once negative emotions in the formulation stage are highly aroused, users may terminate information seeking: "a07: If I find myself searching aimlessly without direction, I get very anxious and will terminate the search, starting over." However, if positive emotions are highly aroused, they usually positively affect information seeking. For instance, in the "selection stage," after understanding search topics, users generate positive emotions. High arousal of positive emotions at this stage helps express information needs: "a15: As I gradually understand the topic, I feel proud and satisfied, more confident, which continues to enrich search channels, formulate search strategies, making information seeking more traceable and scientific." Similarly, in the "formulation stage," after clarifying thinking and goals, confidence increases and optimism emerges. High arousal of this positive emotion guides users to conduct deeper searches and record relevant information: "a05: After finding the correct search direction, my confidence increases, I'm happy, relaxed, and comfortable, which motivates me to search and record more information."

Medium arousal states appear only twice during information seeking, in exploration and formulation stages, with behavioral effects not significantly different from low arousal. For example, in the "exploration stage," some respondents generate medium-arousal negative emotions: "a03: If initial search results are unsatisfactory, I should continue searching, feeling a bit annoyed but not particularly so, gradually finding search directions." "a11: I feel anxious and a bit frustrated, but such emotions don't affect my behavior yet." In the "formulation stage," if users "cannot clarify goals," they show medium-arousal negative emotions: "a20: I feel a bit annoyed and frustrated, maybe wanting to escape,

but later I'll pull myself together to find solutions. I may pause for a while if it's not urgent. This emotion lasts for some time but then I regulate myself." "a04: I feel a bit annoyed, will abandon this search direction, check other web pages or Baidu, or change search terms."

Low arousal states appear in multiple information seeking stages. For example, in the "initiation stage," some respondents generate low-arousal uncertainty emotions: "a02: If starting a new topic and feeling lost about unfamiliar things, I might feel slightly nervous, relatively mild, then try to analyze the topic." "a16: If the topic is unfamiliar, many things I can't focus on, opening and closing them, but generally I'll search basic concepts first, understand the topic to reduce confusion, then search for complex things." Similarly, negative emotions generated in the "exploration stage" also show low arousal: "a12: I may feel slightly nervous but will continue searching. If I can find desired literature, I may not feel nervous anymore." In the "formulation stage," if users "cannot clarify goals," they generate negative emotions, but some respondents indicate minimal emotional change and behavioral impact: "a20: I feel slightly anxious, but this suggests there are still some thinking problems. I think turning back to reorganize thoughts would work, or I can consult teachers or seniors for relevant information and channels." "a09: I feel a bit frustrated, will calm down for a while, then continue searching."

Notably, the same medium/low arousal states of negative emotions cause positive behavior in the "exploration stage" but negative behavior in the "formulation stage." The possible reason: Negative emotions in the "exploration stage" mainly stem from users' inaccurate expression of information needs. However, since users are still "exploring," they can psychologically accept these negative emotions and work toward clarifying thoughts and goals. In the "formulation stage," negative emotions mainly come from search behaviors where users have already invested effort but still haven't found clear goals. At this point, both time consumption and effort expenditure far exceed those in the "exploration stage," easily leading to increased expectation gaps and consequently negative behaviors like pausing information seeking.

4.5.2 Behavioral Characteristics Postgraduates exhibit positive or negative behaviors due to specific emotional valence and arousal during online academic information seeking. These behaviors are also external manifestations of their information seeking. The following analyzes these two behavior types separately.

(1) Positive Behaviors. In this study, positive behaviors mainly include understanding themes, clarifying goals, and in-depth searching.

"Understanding themes" refers to users understanding information seeking task themes and deciding search strategies. It may relate to users' "uncertainty, curiosity" and other neutral emotions being aroused, or appear when users re-examine topics and update search strategies after obtaining unsatisfactory

results. For instance: “a16: At the beginning of searching, due to unfamiliarity with the topic, many things I can’t focus on, opening and closing them, but generally I’ll search basic concepts first, understand the topic to reduce confusion, then search for complex things.” “a20: If I can’t get desired results, this actually suggests there are still some thinking problems. I think turning back to reorganize thoughts would work, or I can consult teachers or seniors for relevant information and channels.”

“Clarifying goals” relates to users’ “frustration, anxiety, tension” and other negative emotions in low/medium arousal states, appearing in the formulation stage when users clarify thinking and search goals gradually become clear: “a06: If search results are unsatisfactory, I feel a bit annoyed but will continue searching, increasing search frequency. If still not found, I’ll search through more channels, not just literature databases, but maybe through Baidu or other channels.” Regarding negative emotions triggering positive behavior, L.M. Isbell et al. also found that negative emotions suggest problems exist, thus prompting individuals to obtain information to solve problems [31].

“In-depth searching” relates to users’ “confidence increase, relaxed optimism” and other positive emotions being aroused, generally appearing in the collection stage. At this stage, positive emotions aroused by clarified search goals motivate users to conduct deeper searches and collect information: “a02: After finding the search direction, I’m definitely excited, confidence increases, which will inspire more confident searching next time, encouraging myself to conduct deeper-level searches.” “a22: After obtaining some needed information, I’m very happy, and such emotions make me continue searching for more relevant articles, sometimes even beyond the current research scope.”

(2) Negative Behaviors. In this study, negative behaviors mainly include information avoidance, search suspension, and search termination.

Research shows that “information avoidance” is mainly triggered by high arousal states of neutral emotions in the “initiation stage”: “a11: I’m curious and a bit anxious. If searching takes too much time and information quality is low, it affects me, making me not want to search anymore… I’ll consult classmates or discuss with them before searching again.” Similarly, A.H. Maslow’s research indicates that when information causes psychological discomfort or dissonance, people choose to avoid information. The difference is that he believed people could avoid information to reduce anxiety, where avoidance is not necessarily negative behavior [44].

“Search suspension” mainly occurs in the “formulation stage.” If users consume much time and energy and disappointment gradually increases, negative emotions at this stage easily lead to temporary suspension of search behavior: “a02: If I can’t find search goals, I feel a bit annoyed and frustrated, maybe wanting to escape, but later I’ll pull myself together to find solutions. I’ll pause for a while if it’s not urgent. This emotion lasts for some time but then I regulate myself.” N. Kyungsik et al. [45] also found that processing more negative emo-

tions reduces searchers' efforts, making it highly likely to interrupt information seeking.

"Search termination" specifically refers to users losing patience due to emotional pressure and terminating entire academic information seeking behavior. It is usually triggered by highly aroused negative emotions: "a06: When encountering difficulties in searching, I feel anxious and even lost, sometimes thinking about giving up, lacking patience. When I still can't find after several attempts, I'll give up." As D.O. Case et al. noted, due to intensified anxiety, the frequency of information seeking failure can be high; when a person faces massive information and cannot judge its quality, they easily stop information seeking [46]. M.Y. Zanganeh et al.'s research on user emotions and information retrieval effectiveness also shows that users with happy emotions tend to invest more time in information retrieval and result browsing, use more information sources, and construct more search formulas; the more fearful and unhappy users feel, the earlier they end searching because no positive reinforcement can continue their search behavior [47].

5 Conclusion and Discussion

5.1 Comparison of Research Findings

Compared with C.C. Kuhlthau's research model, this study makes the following deepening or expansion:

(1) Based on two-dimensional emotion theory, it reflects elements such as emotional valence and emotional arousal in user information seeking behavior, thus providing richer revelation of the relationship between emotion and information behavior.

(2) It specifically analyzes types of positive and negative behaviors caused by emotional valence and arousal at different stages of postgraduates' online academic information seeking behavior.

(3) It constructs a postgraduates' online academic information seeking behavior model incorporating the mechanism of emotional valence and arousal.

5.2 Research Conclusions

This study attempts to use qualitative research to explore the emotional mechanism in postgraduates' online academic information seeking behavior. Findings indicate: Postgraduates generate different types of emotional valence and arousal during online academic information seeking, including positive, neutral, and negative emotions, as well as high, medium, and low arousal levels. Positive emotions trigger positive behaviors; neutral emotions' impact on seeking behavior relates to arousal level, with different arousal levels leading to behavioral differences; most notably, negative emotions' impact on seeking behavior relates not only to arousal level but also to the stage of seeking behavior.

5.3 Research Implications

(1) Since positive emotions positively impact users' information seeking behavior, information service institutions should create information service environments conducive to maintaining users' positive emotions.

(2) Neutral emotions in the initiation stage deserve attention because, if well-guided, they develop positively; otherwise, they trigger unnecessary negative behaviors. Information service institutions should guide this emotional state during users' initial information seeking stages, while users themselves also need to appropriately regulate neutral emotions to develop them positively.

(3) Given that negative emotions may also develop toward positive behavior, when users face negative emotions in information seeking, if not highly aroused, they may not need deliberate control or avoidance.

5.4 Research Limitations

Due to time and capacity constraints, this study still has some limitations: In data collection, data collected through in-depth interviews may have objectivity deficiencies due to users' memory biases. Future research could use experimental methods based on specific search tasks to conduct on-site observation and recording of seeking behavior and emotional changes. Interview data analysis was mainly completed through manual coding, which is somewhat subjective and single-method. Future research could use qualitative coding software such as NVivo and Atlas.ti for data analysis. To ensure comparability with C.C. Kuhlthau's model, this study did not include task-related factors, user individual factors, etc. in the analysis. Future research could more comprehensively consider user personality traits, cognitive styles, task complexity, time urgency, and other factors.

References

[1] 2019 National Postgraduate Enrollment Survey Report - China Education Online [EB/OL]. [2019-03-04]. https://www.eol.cn/html/ky/2019report/section3.html#sc_3.

[2] Gai Xiaoliang, Liu Juan. Research on Postgraduates' Academic Information Seeking Behavior Model and Empirical Study [J]. Library and Information Service, 2015, 59(8): 15-24.

[3] BRONSTEIN J. The role of perceived self-efficacy in the information seeking behavior of library and information science students [J]. Journal of academic librarianship, 2014, 40(2): 101-106.

[4] COLMAN AM. A dictionary of psychology [EB/OL]. [2019-03-04]. http://www.oxfordreference.com/search?q=emotion&searchBtn=Search&isQuickSearch=true.

[5] Meng Zhaolan. Emotion Psychology [M]. Beijing: Peking University Press, 2005.

[6] LAZARUS RS, FOLKMAN S. Stress, appraisal, and coping [M]. New York: Springer, 1984.

[7] RUSSELL JA, BARRETT LF. Core affect, prototypical emotional episodes, and other things called emotion: dissecting the elephant [J]. Journal of personality and social psychology, 1999, 76(5): 805-819.

[8] BAGOZZI RP, GOPINATH M, NYER PU. The role of emotions in marketing [J]. Journal of the academy of marketing science, 1999, 27(2): 184-206.

[9] Zhang Zhiping. The Essence and Meaning of Emotion: An Introduction to Scheler's Emotional Phenomenology [M]. Shanghai: Shanghai People's Publishing House, 2006: 59.

[10] Shi Ying. Analysis of the Impact of Emotion on Information Satisfaction Judgment [D]. Chongqing: Southwest University, 2008.

[11] RUSSELL JA. A circumplex model of affect [J]. Journal of personality and social psychology, 1980, 39(6): 1161-1178.

[12] PHELPS EA, LEDOUX JE. Contributions of the amygdala to emotion processing: from animal models to human behavior [J]. Neuron, 2005, 48(2): 175-187.

[13] KUHLTHAU CC. Inside the search process: information seeking from the user's perspective [J]. Journal of the American Society for Information Science & Technology, 1991, 42(5): 361-371.

[14] WILSON TD. On user studies and information needs [J]. Journal of documentation, 1981, 37(6): 658-670.

[15] NAHL D. Social-biological information technology: an integrated conceptual framework [J]. Journal of the American Society for Information Science and Technology, 2007, 58(13): 2021-2046.

[16] SAVOLAINEN R. Emotions as motivators for information seeking: a conceptual analysis [J]. Library & information science research, 2014, 36(1): 59-65.

[17] DERVIN B. An overview of sense-making research: concepts, methods, and results to date [EB/OL]. [2019-07-31]. http://faculty.washington.edu/wpratt/MEBI598/Methods/An%20Overv
Making%20Research%201983a.htm.

[18] Huang ?, Li Jingjin, Wu Yingmei. Emotional Load Theory and Its Application in Information Behavior Research: A Review [J]. Library and Information Service, 2018, 62(12): 116-124.

[19] FITZGERALD SR. The role of affect in the information seeking of productive scholars [J]. The journal of academic librarianship, 2018, 44(2): 263-268.

[20] AGHAEI F, SOLEYMANI MR, RIZI HA. Information seeking anxiety among M.A. students of Isfahan university of medical sciences [J]. Journal of education & health promotion, 2017, 6(1).

[21] Cha Xianjin, Zhang Jinchao, Yan Yalan. Research on Influencing Factors of Users' Academic Information Seeking Behavior in Weibo Environment: A Dual-Path Perspective of Information Quality and Source Credibility [J]. Journal of Library Science in China, 2015, 41(3): 71-86.

[22] Liang Zidong. Research on Student Users' Academic Information Search Pattern Based on ISP Model [D]. Nanjing: Nanjing University, 2015.

[23] Jiang Tingting, He Honghong, Zhang Zhengnan. Research on the Impact of Search Task Complexity on User Emotion [J]. Library and Information Knowledge, 2016(4): 74-82.

[24] Han Zhengbiao, Luo Rui, Zhao Jie. Experimental Study on the Impact of Academic Users' Emotional Control and Mental Models on Information Retrieval Performance [J]. Information Studies: Theory & Application, 2017, 40(1): 59-64.

[25] WU D, DANG W Y, HE D Y. Undergraduate information behaviors in thesis writing: a study using the information search process model [J]. Journal of librarianship and information science, 2017, 49(3): 256-268.

[26] SCHWARZ N. Feelings as information: informational and motivational functions of affective states [M]//Handbook of motivation and cognition: foundations of social behavior. New York: Guilford Press, 1990: 527-561.

[27] FREDRICKSON BL. What good are positive emotions? [J]. Review of general psychology, 1998, 2(3): 300-319.

[28] FREDRICKSON BL. The role of positive emotions in positive psychology. The broaden-and-build theory of positive emotions [J]. American psychologist, 2001, 56(3): 218-226.

[29] TANGNEY JP. The self-conscious emotions: shame, guilt, embarrassment and pride [M]//Handbook of cognition and emotion. New Jersey: John Wiley & Sons, Ltd, 1999: 541-568.

[30] ASPINWALL LG. Rethinking the role of positive affect in self-regulation [J]. Motivation & emotion, 1998, 22(1): 1-32.

[31] ISBELL LM, BURNS KC, HAAR T. The role of affect on the search for global and specific target information [J]. Social cognition, 2005, 23(6): 529-552.

[32] TIEDENS LZ, LINTON S. Judgment under emotional certainty and uncertainty: the effects of specific emotions on information processing [J]. Journal of personality and social psychology, 2001, 81(6): 973-988.

[33] ASHFORD SJ. Feedback-seeking in individual adaptation: a resource perspective [J]. Academy of management journal, 1986, 29(3): 465-487.

[34] TROPE Y, NETER E. Reconciling competing motives in self-evaluation: the role of self-control in feedback seeking [J]. Journal of personality & social psychology, 1994, 66(4): 646-657.

[35] Wang Haocheng, Wang Shuyun, Che Jun tie. Research Progress on Foreign Information Seeking Behavior from Emotional Perspective [J]. Information Science, 2018, 36(2): 165-170.

[36] SCHIMMACK U, DERRYBERRY D. Attentional interference effects of emotional pictures: threat, negativity, or arousal? [J]. Emotion, 2005, 5(1): 55-66.

[37] NIELEN MM, HESLENFELD DJ, HEINEN K, et al. Distinct brain systems underlie the processing of valence and arousal of affective pictures [J]. Brain & cognition, 2009, 71(3): 387-396.

[38] STEFANUCCI JK, STORBECK J. Don't look down: emotional arousal elevates height perception [J]. Journal of experimental psychology general, 2009, 138(1): 131-145.

[39] Gan Tian, Luo Yuejia, Zhang Zhijie. The Effect of Emotion on Time Perception [J]. Psychological Science, 2009(4): 836-839.

[40] ZHOU M. University students' emotion during online search task: a multiple achievement goal perspective [J]. The journal of psychology, 2016, 150(5): 576-590.

[41] Qiu Jin, Wu Dan. Emotion Research in Collaborative Information Retrieval Behavior [J]. Library and Information, 2013(2): 105-110.

[42] KUHLTHAU CC. A principle of uncertainty for information seeking [J]. Journal of documentation, 1993, 49(4): 339-355.

[43] ARAPAKIS I. Affective feedback: an investigation into the role of emotions in the information seeking process [C]//International ACM SIGIR conference on research and development in information retrieval. New York: ACM, 2008: 395-402.

[44] MASLOW AH. The need to know and the fear of knowing [J]. The journal of general psychology, 1963, 68(1): 111-125.

[45] KYOUNGSIK N, WONTAEC. Mental states in information search process [J]. Journal of Korean library and information science society, 2017, 48(3): 281-302.

[46] CASE DO, GIVEN LM. Looking for information: a survey of research on seeking, needs, and behavior [M]. Bingley: Emerald Group Publishing Limited. 2016.

[47] ZANGANEH MY, HARIRIN. The role of emotional aspects in the information retrieval from the Web [J]. Online information review, 2018, 42(4): 520-534.

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Forthcoming Articles

Special Contribution: Construction, Performance and Application of People's Daily Word Segmentation Corpus in the New Era (III)

Research on Fine-Grained Aggregation Ontology Construction for Network Academic Documents —— Analysis and Comparison of Sentence Length and Words (Huang Shuiqing, Wang Dongbo)

Special Topic: Research on GIS-Based Public Library Geographic Spatial Layout (Organized by Associate Professor Li Zhuozhuo)

Analysis of Evolution Trends in Citation Behavior and Its Impact on Citation Evaluation (Suo Chuanjun, Wang Xueyan)

Research on Methodological Framework for Big Data Governance System Construction (An Xiaomi, Wang Lili)

Current Status and Prospects of Scientific Data Sharing Research (Bi Datian, Cao Ran, Du Xiaomin)

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