An Investigation into the Relationship Between University Students' Personal Academic Information Organization Behavior and Academic Procrastination (Postprint)

Authors: Meng Gaohui, Liu Chang

Date: 2023-04-01T00:00:00+00:00

Abstract

[Purpose/Significance] This study conducts an empirical investigation into the relationship between college students' personal academic information organization behavior and academic procrastination, aiming to discover the role of organizing personal academic information in preventing or correcting procrastination.

[Method/Process] First, data were collected using a questionnaire survey method. The questionnaire included the College Students' Academic Information Organization Level Scale, the GPS Scale (Chinese Revised Version), and the NASP Scale (Chinese Revised Version). Then, homogeneity reliability testing and confirmatory factor analysis were employed to evaluate questionnaire quality. Finally, descriptive statistics, correlation tests, and difference tests were used to analyze the relationship between college students' personal academic information organization behavior and academic procrastination.

[Results/Conclusions] There exists a significant association between personal academic information organization behavior and academic procrastination; improvements in personal academic information organization behavior may help college students prevent or correct procrastination.

Full Text

Preamble

Title: An Empirical Study on the Association Between Personal Academic Information Organization Behavior and Academic Procrastination Among College Students

Authors: Meng Gaohui, Liu Chang

Affiliation: Department of Information Management, Peking University, Beijing 100871

Abstract: [Purpose/Significance] This paper conducts an empirical study on the association between personal academic information organization behavior and academic procrastination among college students to discover the role of organizing personal academic information in preventing or correcting "procrastination." [Method/Process] First, questionnaire surveys were used to collect data, including the College Student Academic Information Organization Level Scale, the GPS Scale (Chinese Revised Version), and the NASP Scale (Chinese Revised Version). Then, homogeneity reliability tests and confirmatory factor analysis were employed to evaluate questionnaire quality. Finally, descriptive statistics, correlation tests, and difference tests were used to analyze the relationship between college students' personal academic information organization behavior and academic procrastination. [Result/Conclusion] Personal academic information organization behavior is significantly associated with academic procrastination, and improvements in personal academic information organization behavior may help college students prevent or correct "procrastination."

Keywords: personal academic information organization behavior; personal academic information organization level; academic procrastination; active procrastination; college students

Classification Number: G251

DOI: 10.13266/j.issn.0252-3116.2021.22.009

Academic procrastination refers to the behavior of intentionally delaying or postponing required learning tasks [1], a phenomenon that is widespread among college students. Foreign scholars have noted that approximately 30% to 60% of undergraduate students regularly postpone various learning tasks, including preparing for exams, writing term papers, and completing weekly reading assignments [2]. Domestic research indicates that as many as 39.7% of Chinese college students exhibit significant academic procrastination, with no substantial differences across majors, regions, or types of institutions [3]. As a negative behavior, irrational "procrastination" may reduce academic performance [4-5], increase negative emotions, and adversely affect physical and mental health [6-8], necessitating appropriate interventions.

2 Literature Review

2.1 Theoretical Foundation

Personal academic information organization behavior refers to self-initiated actions taken by learners to facilitate future use, including selecting and implementing organization schemes, as well as updating, deleting, and backing up information items in their collections [9]. Based on Self-Regulated Learning (SRL)

theory, personal academic information organization behavior can be viewed as a cognitive strategy in the SRL process that may influence self-regulated learning ability. SRL is defined as learners' autonomous generation of thoughts, emotions, and behaviors oriented toward achieving learning goals, representing a self-directed process of transforming mental capabilities into learning skills [11]. SRL theory posits that academic procrastination stems from failures in self-regulated learning, and numerous studies have verified associations between various components of SRL and academic procrastination. From the perspective of learning motivation, passive procrastination is often associated with avoidance goal orientation [12-15] and lower self-efficacy [6, 12, 16]. From the perspective of learning strategies, procrastination is linked to inefficient cognitive strategies and limited use of metacognitive strategies for monitoring and regulating the learning process [12-13, 17]. Consequently, negative procrastination is considered a result of low self-regulated learning ability and a manifestation of SRL failure [6, 10].

Cognitive instructional psychology research regards SRL as a form of cognitive engagement [18]. As a cognitive pattern for learners to organize and structure complex information, SRL is seen as an effort to increase, deepen, and manipulate content networks or associative memory networks in a specific domain, and to supervise and improve this deepening process. From this perspective, any SRL process for complex tasks includes five component processes: alertness, selection, connection, planning, and monitoring. The "connection" process involves "searching for familiar information in memory and connecting newly input information with familiar information."This internal cognitive activity typically requires external behaviors for implementation and reinforcement, such as personal academic information organization behavior. By organizing personal academic information, learners not only integrate new information items into existing information structures in physical information space but also connect new knowledge with existing knowledge in cognitive space [19]. Personal academic information organization can thus be regarded as a behavioral and cognitive strategy in the "connection" process of SRL, potentially affecting learners' SRL capabilities and effectiveness. Therefore, theoretically, there is a certain association between personal academic information organization behavior and academic procrastination, though no empirical research has yet confirmed this relationship.

2.2 Research on Academic Procrastination

Academic procrastination is a complex psychological phenomenon comprising cognitive, emotional, and behavioral components. L. J. Solomon and E. D. Rothblum defined it as "the act of unnecessarily delaying learning tasks to the point of producing subjective discomfort" [20], while P. Steel described it as "the behavior of delaying completion of learning tasks despite being aware of the negative consequences of procrastination"[6]. Research on academic procrastination began in the 1980s, and the behavior has received widespread attention in edu-

cation and psychology due to its prevalence and negative impacts. Influencing factors have been a key research focus, with studies examining causes of academic procrastination from trait theory, motivation theory, and self-regulation perspectives [21-23]. Trait theory views procrastination as a personality trait, with research primarily exploring associations between the Big Five personality dimensions (conscientiousness, neuroticism, extraversion, openness, and agreeableness) and academic procrastination [24-27], as well as perfectionism [28-30]. Motivation theory focuses on the overall context of procrastination, examining associations with task interest, difficulty, importance, attractiveness, and aversiveness [31-33]. Self-regulation theory considers procrastination a result of self-regulated learning failure, investigating factors such as motivational beliefs, goal orientation, self-efficacy, cognitive strategies, and metacognitive strategies [14-15, 34].

Additionally, the intrinsic characteristics of academic procrastination have been a research focus, with differing scholarly viewpoints. Traditional perspectives view procrastination as irrational, with definitions emphasizing unnecessary delay [35], irrational postponement [36], or delay despite awareness of negative consequences [6]. However, some scholars argue for its rationality. J. R. Ferrari and J. F. Díaz-Morales categorized procrastination into decisional, arousal, and avoidance types, suggesting that avoidance procrastination largely serves to protect self-worth while arousal procrastination aims to experience the thrill of last-minute efforts [37]. A. H. C. Chu and J. N. Choi explicitly distinguished between passive and active procrastination based on cognitive, emotional, and behavioral differences [38]. Although active and passive procrastinators exhibit similar levels of procrastination, active procrastinators share many positive characteristics with non-procrastinators, including more purposeful time use, stronger sense of time control, higher self-efficacy, and more positive personal outcomes. Given ongoing debates about motivation and outcomes, many researchers now simply define procrastination as "the behavior of intentionally delaying or postponing required learning tasks," without emphasizing its irrationality.

Overall, research on procrastination influences has shifted from trait and motivation theories to self-regulation theory [21-23]. While existing studies have examined overall cognitive strategy use in relation to procrastination, none have focused on personal academic information organization behavior as a specific cognitive strategy. Furthermore, although the concept of active procrastination has expanded traditional research boundaries, comparative studies of different procrastination types remain limited, requiring further investigation to reveal differences between passive and active procrastination.

2.3 Research on Personal Information Organization Behavior

Personal information organization behavior is a sub-activity of Personal Information Management (PIM). With increasing information overload and fragmentation, it has gained attention in information behavior research. User behavioral characteristics have been a key focus. Some studies have examined individual

information organization behaviors using various methods (ethnography [39], interviews [40], logging [41], questionnaires [42], automated computer programs [43]), while others have investigated organization strategies in personal information space, categorizing users' strategies based on their comprehensive performance across multiple organization behaviors [19, 44-45]. Recent research has begun exploring personal information organization behavior from a holistic perspective, such as K. E. Oh' s modeling of electronic file organization processes and proposal of a personal information organization process model [46], and Meng and Liu' s development of a College Student Academic Information Organization Level Scale for measuring personal information behavior [9].

Research on influencing factors of personal information organization behavior has examined various internal individual factors and external information and contextual factors. Individual factors include personal habits, cognitive abilities, emotional factors, and personality traits [47-49]; information factors include information value judgment, sources, types, and usage [46, 50-51]; contextual factors include task situations, software/hardware environments, and spatiotemporal distribution [51-52]. Zhan Nan constructed a systematic model of influencing factors for researchers' personal academic information organization behavior [53]. Although existing research has explored multiple factors, gaps remain. For example, regarding personality traits, studies have only focused on the Big Five model, while procrastination and other personality traits potentially associated with personal information organization behavior have been overlooked.

In summary, based on SRL theory, personal academic information organization behavior can be considered a cognitive strategy in the SRL process that may influence self-regulated learning ability, while negative academic procrastination is a result of low SRL ability. The two are theoretically related, and improvements in personal academic information organization behavior may help prevent or correct irrational "procrastination." While existing research has examined overall cognitive strategy use in relation to procrastination, no studies have explored the relationship between specific cognitive strategies like personal academic information organization behavior and procrastination from an information behavior perspective, nor have they investigated procrastination as a personality trait affecting personal information organization behavior. This study therefore conducts an empirical investigation on "the association between college students' personal academic information organization behavior and academic procrastination." Additionally, by distinguishing between passive and active procrastination, this research not only analyzes correlations between personal academic information organization behavior and general procrastination levels and active procrastination levels but also compares performance across non-procrastinators, passive procrastinators, and active procrastinators, making the topic theoretically and practically significant.

3 Questionnaire Design

To investigate the research topic, this study used questionnaire surveys to collect data. The "College Student Personal Academic Information Organization Behavior and Academic Procrastination Questionnaire" comprised three parts: background information, a self-developed College Student Academic Information Organization Level Scale to assess personal academic information organization behavior, and established college student procrastination scales to measure academic procrastination.

3.1 Background Information

The background information section included five single-choice questions on gender, university, grade, faculty, and academic ranking to help eliminate unqualified respondents and ensure balanced distribution across demographic and academic characteristics.

3.2 College Student Academic Information Organization Level Scale

The College Student Academic Information Organization Level Scale has been validated as having good quality [9]. This scale measures multiple personal academic information organization behaviors to assess college students' ability to organize personal academic information (i.e., "personal academic information organization level"). It evaluates both students' organizational capabilities and the degree to which their personal academic information is organized.

The scale includes 25 items across five factors: computer file organization level (7 items), paper material organization level (6 items), academic information management literacy (5 items), academic space cleanliness level (4 items), and classroom note organization level (3 items). Using a 5-point Likert format, response options are assigned values of 1-5, with items 4, 6, and 7 reverse-scored. The scale score is termed "personal academic information organization level," with higher scores indicating stronger organizational ability or better-organized information. Subscale scores are termed "computer file organization level," "paper material organization level," "academic information management literacy," "academic space cleanliness level," and "classroom note organization level." Both scale and subscale scores are calculated as "total score ÷ number of items," with value ranges of 1-5.

3.3 College Student Procrastination Scale

This section included two scales: (1) the General Procrastination Scale, measuring "general procrastination" defined as "delaying required tasks" without emphasizing irrationality, used to measure general procrastination levels and classify respondents as non-procrastinators or procrastinators; and (2) the Active Procrastination Scale, measuring active procrastination levels and further classifying procrastinators as passive or active. Both scales were selected from established instruments.

3.3.1 General Procrastination Scale The study selected C. H. Lay' s GPS (General Procrastination Scale for Student Populations), which measures procrastination through 20 habitual responses in students' lives [54]. This scale was chosen because it emphasizes task postponement without highlighting irrationality, aligning with the concept of "general procrastination,"and has demonstrated high reliability and validity across many studies. Lay reported internal consistency reliability of 0.89 and test-retest reliability of 0.60, while J. R. Ferrari confirmed its validity as an effective tool for measuring procrastination behavior [55]. However, due to temporal changes and cultural differences, some items in the original English GPS were unsuitable for contemporary Chinese college students, so this study used the Chinese revised version by Li Jing [56]. This version includes 13 items across two factors: delay (8 items) and timeliness (5 items), with internal consistency reliability of 0.80, test-retest reliability of 0.71, and acceptable confirmatory factor analysis fit indices.

The GPS (Chinese Revised Version) used a 5-point Likert format with options "completely disagree, disagree, uncertain, agree, completely agree" assigned values of 1-5, with items 3, 7, 8, 11, and 13 reverse-scored. The scale score is termed "general procrastination level," with higher scores indicating greater procrastination. Scores are calculated as "total score ÷ number of items," ranging from 1-5. Using the midpoint of 3, respondents scoring $1 \leq \text{score} < 3$ are classified as non-procrastinators, while those scoring $3 \leq \text{score} \leq 5$ are classified as procrastinators. Non-procrastinators exhibit minimal procrastination, occasionally delaying required tasks, whereas procrastinators habitually and frequently postpone required tasks.

3.3.2 Active Procrastination Scale The most widely used scale for measuring active procrastination is J. N. Choi and S. V. Moran' s NASP (A New Active Procrastination Scale), which includes 16 items across four factors: outcome satisfaction, pressure preference, active decision to procrastinate, and ability to complete tasks on time [57]. To meet research needs for Chinese college students, this study used the Chinese revised version by Ni Shiguang et al. [58], which includes 15 items across the same four factors: outcome satisfaction (3 items) and the remaining factors with 4 items each. The scale demonstrated internal consistency reliability of 0.840, split-half reliability of 0.80, test-retest reliability of 0.813, and acceptable confirmatory factor analysis fit indices. External validity was established through significant correlations with general self-efficacy, academic satisfaction, passive procrastination, and final grades.

The NASP (Chinese Revised Version) used a 7-point Likert format with options "strongly disagree, disagree, somewhat disagree, uncertain, somewhat agree, agree, strongly agree" assigned values of 1-7, with items 4-7 and 12-15 reverse-scored. The scale score is termed "active procrastination level," with higher scores indicating greater tendency toward active procrastination and lower scores indicating passive procrastination. Scores are calculated as "total score ÷ number of items," ranging from 1-7. Following Ni Shiguang et al.' s

criteria [59], the theoretical median of 3.67 was used to classify procrastinators: scores of 1-3.67 indicate passive procrastinators, while scores of 3.67-7 indicate active procrastinators. Passive procrastinators procrastinate unintentionally, experiencing pressure, guilt, and depression near deadlines, feeling pessimistic about their abilities, and potentially abandoning tasks. Active procrastinators intentionally decide to procrastinate because they work effectively under deadline pressure, feeling challenged and motivated, with higher efficiency and concentration, persisting until task completion.

4 Data Collection and Assessment

4.1 Data Collection

The survey targeted undergraduate students at Peking University (PKU). Questionnaires were distributed through the Wenjuanxing platform from March 20-23, 2020, with respondents receiving a 3 RMB red envelope upon completion. A total of 1,173 questionnaires were collected. After eliminating non-PKU undergraduates and invalid questionnaires with identical or patterned responses, 866 valid questionnaires remained, yielding a 73.83% validity rate. Sample characteristics are shown in Table 1 , demonstrating balanced and comprehensive coverage across gender, grade, faculty, and academic ranking, ensuring representativeness.

4.2 Data Quality Assessment

To ensure credible subsequent analyses, questionnaire data quality was assessed by testing the reliability and validity of the College Student Academic Information Organization Level Scale, GPS (Chinese Revised Version), and NASP (Chinese Revised Version).

4.2.1 Reliability Assessment Reliability assessment examines the consistency of measurement results when using a scale repeatedly. This study tested internal consistency (homogeneity reliability) for each scale and its dimensions, as shown in Table 2 . R. F. DeVellis considers α coefficients between 0.7-0.8 as "quite good" and above 0.8 as "excellent" [60]. All three scales and their factors achieved α coefficients above 0.7, indicating good reliability.

4.2.2 Validity Assessment Validity assessment examines the accuracy of measurement, or the degree to which results align with the intended concept. This study used confirmatory factor analysis to test structural validity—the extent to which empirical data align with the conceptual logic. Using AMOS software, items were treated as observed variables and factors as latent variables to construct structural equation models for each scale. Fit indices are shown in Table 3 . While the GPS (Chinese Revised Version) ^{2}/df value was less ideal, this was primarily due to the large sample size (866) far exceeding the

10:1 ratio to items (13), as ^{2} is highly sensitive to sample size [56]. Other indices for all three scales reached good or acceptable levels, confirming adequate validity.

Reliability and validity results indicate good questionnaire data quality, lending credibility to subsequent analyses.

5 Data Analysis and Results

5.1 Characteristics of PKU Undergraduates' Personal Academic Information Organization Behavior and Procrastination

Before examining associations, this section describes PKU undergraduates' personal academic information organization behavior and procrastination patterns, and analyzes their correlations with academic performance.

5.1.1 Personal Academic Information Organization Behavior Characteristics Descriptive statistics for personal academic information organization level and its dimensions are shown in Table 4 . The sample' s mean organization level was 3.447, with sub-dimension means ranging from 3.167-3.771, all slightly above the midpoint of 3, indicating moderately high organizational ability among PKU undergraduates. Spearman correlation analysis between organization level and academic ranking yielded a coefficient of 0.1 ($p = 0.003$), showing a significant positive correlation—students with higher organization levels achieved better academic performance.

5.1.2 Procrastination Patterns Descriptive statistics for general and active procrastination levels are shown in Table 5 . The mean general procrastination level was 3.1, slightly above the midpoint of 3, while the mean active procrastination level was 3.97, slightly above the theoretical median of 3.67. This suggests PKU undergraduates exhibit moderate general procrastination and moderately high active procrastination—they frequently postpone required tasks but tend toward active procrastination, seeking challenge and pressure to enhance efficiency and concentration.

Further classification by predetermined criteria yielded distributions shown in Figures 1-3 [Figure 1: see original paper][Figure 2: see original paper][Figure 3: see original paper]. Non-procrastinators comprised 47% of the sample, procrastinators 53%. Among procrastinators, active procrastinators accounted for 54% and passive procrastinators 46%, representing 29% and 24% of the total sample respectively. This indicates academic procrastination is prevalent and serious among PKU undergraduates, with over half habitually delaying tasks. While more students intentionally procrastinate for efficiency, nearly half procrastinate unintentionally, experiencing pressure, guilt, and pessimism near deadlines, sometimes failing to complete tasks.

Correlation analysis between procrastination levels and academic ranking

showed: (1) general procrastination correlated negatively with academic ranking ($r = -0.18$, $p < 0.001$)—less procrastination associated with better performance; (2) active procrastination correlated positively with academic ranking ($r = 0.142$, $p < 0.001$)—greater active procrastination associated with better performance; (3) Kruskal-Wallis tests across the three procrastinator types showed significant differences ($p < 0.001$), with rankings of: non-procrastinators ($M = 3.58$) > active procrastinators ($M = 3.36$) > passive procrastinators ($M = 2.96$). Pairwise comparisons revealed significant differences between non-procrastinators and passive procrastinators ($p < 0.001$) and between active and passive procrastinators ($p = 0.002$), but not between non-procrastinators and active procrastinators ($p = 0.61$), confirming that passive procrastinators perform significantly worse than both non-procrastinators and active procrastinators.

5.2 Association Between Personal Academic Information Organization Behavior and Academic Procrastination

5.2.1 Correlation Between Organization Behavior and Procrastination Levels Spearman correlations between personal academic information organization level (and its dimensions) and procrastination levels are shown in Table 6 . Organization level and all dimensions correlated significantly and negatively with general procrastination, and significantly and positively with active procrastination. This indicates that stronger personal academic information organization ability is associated with less procrastination and greater tendency toward active procrastination when procrastinating, consistent across all organizational dimensions.

5.2.2 Comparison of Three Procrastinator Types in Organization Behavior Kruskal-Wallis tests comparing non-procrastinators, active procrastinators, and passive procrastinators on organization level and dimensions are shown in Table 7 . Rankings for all measures were: non-procrastinators > active procrastinators > passive procrastinators, with all tests significant at $p < 0.001$. Pairwise comparisons revealed: (1) on overall organization level, computer file organization, and academic information management literacy, all three groups differed significantly; (2) on paper material organization, academic space cleanliness, and classroom note organization, non-procrastinators differed significantly from both active and passive procrastinators, while active and passive procrastinators did not differ significantly. This shows non-procrastinators outperform both procrastinator types across all aspects, while active procrastinators outperform passive procrastinators in some areas (computer file organization, information management literacy) but are similar in others.

6 Conclusions and Discussion

6.1 Characteristics of PKU Undergraduates' Personal Academic Information Organization Behavior and Procrastination

This study described PKU undergraduates' personal academic information organization behavior and procrastination patterns and their relationships with academic performance. Findings show PKU undergraduates possess moderately high personal academic information organization ability, though with considerable room for improvement. Higher organization levels correlate with better academic performance, demonstrating the positive role of organization behavior in enhancing SRL ability. Consistent with other research, academic procrastination is prevalent and serious among PKU undergraduates, with over half habitually procrastinating and nearly one-quarter being passive procrastinators suffering from "procrastination." Greater procrastination and more passive procrastination correlate with poorer performance, confirming that negative procrastination results from low SRL ability. Passive procrastinators perform significantly worse than non-procrastinators and active procrastinators, while the latter two groups perform similarly, aligning with findings that active procrastinators share positive outcomes with non-procrastinators [38].

6.2 Association Between Personal Academic Information Organization Behavior and Academic Procrastination

This study explored the relationship between personal academic information organization behavior and academic procrastination. Correlation analyses revealed significant associations: stronger organization ability correlates with less procrastination and greater active procrastination tendency. In other words, students with stronger personal academic information organization skills are less troubled by "procrastination," while those with weaker skills suffer more. This confirms the initial hypothesis that personal academic information organization behavior, as a cognitive strategy in SRL, is associated with academic procrastination as an expression of SRL ability.

Further analysis revealed that active procrastinators performed significantly worse than non-procrastinators in personal academic information organization behavior, even resembling passive procrastinators on some dimensions. This connects to existing literature showing that active procrastination negatively correlates with mastery-approach goal orientation—despite better academic performance, active procrastinators may not be motivated by mastery goals [62]. They exhibit intrinsic motivation levels closer to passive procrastinators and significantly lower than non-procrastinators, thus investing less time and effort in organization behavior, which aims to enhance understanding but is effort-intensive.

These findings suggest that improving college students' personal academic information organization behavior and ability may be a novel and effective measure to help prevent or correct "procrastination." Specific approaches include improving

and promoting personal academic information management software or offering PIM literacy courses to enhance students' PIM competencies. Current personal academic information management software primarily serves researchers' literature management needs and cannot precisely address college students' specific requirements, such as organizing course notes. Future development of personalized tools based on contextual and information factors is essential.

This study has limitations. First, the sample was limited to PKU undergraduates, affecting generalizability; future research should expand the sample. Second, this study only examined overall relationships between organization level and procrastination; future research should explore specific organization behaviors across different contexts. Finally, this study only preliminarily identified the positive significance of improving personal academic information organization behavior for overcoming procrastination; future work should explore effective methods and strategies for such improvement.

References

[1] SCHRAW G, WADKINS T, OLAFSON L. Doing the things we do: a grounded theory of academic procrastination [J]. Journal of educational psychology, 2007, 99(1): 12-25.

[2] RABIN L A, FOGEL J, NUTTER-UPHAM K E. Academic procrastination in college students: the role of self-reported executive function [J]. Journal of clinical and experimental neuropsychology, 2011, 33(3): 344-357.

[3] PANG Weiguo, HAN Guining. Research on the status and causes of learning procrastination among Chinese college students [J]. Tsinghua University Education Research, 2009, 30(6): 59-65, 94.

[4] KIM K R, SEO E H. The relationship between procrastination and academic performance: a meta-analysis [J]. Personality and individual differences, 2015, 82: 26-33.

[5] KIM S, FERNANDEZ S, TERRIER L. Procrastination, personality traits, and academic performance: when active and passive procrastination tell a different story [J]. Personality and Individual Differences, 2017, 108: 154-157.

[6] STEEL P. The nature of procrastination: a meta-analytic and theoretical review of quintessential self-regulatory failure [J]. Psychological bulletin, 2007, 133(1): 65-94.

[7] STEAD R, SHANAHAN M J, NEUFELD R W. "I' ll go to therapy, eventually" : procrastination, stress and mental health [J]. Personality and individual differences, 2010, 49(3): 175-180.

[8] GLICK D M, ORSILLO S M. An investigation of the efficacy of acceptance-based behavioral therapy for academic procrastination [J]. Journal of experimental psychology: general, 2015, 144(2): 400-409.

[9] MENG Gaohui, LIU Chang. Development and application of the College Student Academic Information Organization Level Scale [J]. Library and Information Service, 2021, 65(12): 73-82.

[10] FERRARI J R. Procrastination as self-regulation failure of performance: effects of cognitive load, self-awareness, and time limits on "working under pressure" [J]. European journal of personality, 2001, 15(5): 391-406.

[11] ZIMMERMAN B J. Attainment of self-regulation: a social cognitive perspective [M]//BOEKAERTS M, PINTRICH P R, ZEIDNER M. Handbook of self-regulation. San Diego, CA: Academic Press, 2000: 13-39.

[12] WOLTERS C A. Understanding procrastination from a self-regulated learning perspective [J]. Journal of educational psychology, 2003, 95(1): 179-187.

[13] HOWELL A J, WATSON D C. Procrastination: associations with achievement goal orientation and learning strategies [J]. Personality and individual differences, 2007, 43(1): 167-178.

[14] EUN HEE S. The relationship of procrastination with a mastery goal versus an avoidance goal [J]. Social behavior & personality, 2009, 37(7): 911-919.

[15] HOWELL A, BUROK. Implicit beliefs, achievement goals, and procrastination: a mediational analysis [J]. Learning and individual differences, 2009, 19(1): 151-154.

[16] SCHOUWENBURG H C. Procrastinators and fear of failure: an exploration of reasons for procrastination [J]. European Journal of personality, 1992, 6(3): 225-236.

[17] WOLTERS C A. Advancing achievement goal theory: using goal structures and goal orientations to predict students'motivation, cognition, and achievement [J]. Journal of educational psychology, 2004, 96(2): 236-250.

[18] CORNO L, MANDINACH E B. The role of cognitive engagement in classroom learning and motivation [J]. Educational psychologist, 1983, 18(2): 88-108.

[19] HAROF-JAFFE S, HERSHKOVITZ A, ABU-KISHK H, et al. Students' organization strategy of personal information space [J]. Journal of digital information, 2009, 10(5): 1-17.

[20] SOLOMON L J, ROTHBLUM E D. Academic procrastination: frequency and cognitive-behavioral correlates [J]. Journal of counseling psychology, 1984, 31(4): 504-510.

[21] PANG Weiguo. A review of research on college student learning procrastination [J]. Psychological Science, 2010, 31(5): 1156-1157.

[22] DING Tingting, YU Xiulan, GONG Xue. A comparative study of college student academic procrastination types: from a self-regulated learning theory perspective [J]. Education Academic Monthly, 2015(10): 88-94.

[23] NI Shiguang, LI Hong, HUANG Linyan. Holistic research perspectives on learning procrastination: tradition and innovation [J]. Psychological Development and Education, 2012(5): 99-107.

[24] WATSON D C. Procrastination and the Five-Factor Model: a facet level analysis [J]. Personality and individual differences, 2001, 30(1): 149-158.

[25] LEE D G, KELLY K R, EDWARDS J K. A closer look at the relationships among trait procrastination, neuroticism, and conscientiousness [J]. Personality and individual differences, 2006, 40(1): 27-37.

[26] STEEL P, KLINGSIECK K B. Academic procrastination: psychological antecedents revisited [J]. Australian psychologist, 2016, 51(1): 36-46.

[27] VAN EERDE W. Procrastination in academic settings and the big five model of personality: a meta-analysis [M]. Washington DC: American Psychological Association, 2005.

[28] CLOSSON L M, BOUTILIER R R. Perfectionism, academic engagement, and procrastination among undergraduates: the moderating role of honors student status [J]. Learning and individual differences, 2017, 57: 157-162.

[29] MIAO Lingtong, YANG Mengyuan, ZHAO Kaili, et al. The effect of perfectionism on college students' academic procrastination: a moderated mediation model [J]. Applied Psychology, 2018, 24(3): 252-260.

[30] TIAN Hongjie. The effect of perfectionism high standards on college students' procrastination: a chain mediation effect analysis [J]. Psychological and Behavioral Research, 2019, 17(5): 668-674.

[31] PADEN N, STELL R. Reducing procrastination through assignment and course design [J]. Marketing education review, 1997, 7(2): 17-25.

[32] ACKERMAN D S, GROSS B L. My instructor made me do it: task characteristics of procrastination [J]. Journal of marketing education, 2005, 27(1): 5-13.

[33] MCCREA S M, LIBERMAN N, TROPE Y, et al. Construal level and procrastination [J]. Psychological science, 2008, 19(12): 1308-1314.

[34] SENÉCAL C, KOESTNER R, VALLERAND R J. Self-regulation and academic procrastination [J]. The journal of social psychology, 1995, 135(5): 607-619.

[35] TUCKMAN B W, SEXTON T L. Effects of relative feedback in overcoming procrastination on academic tasks [C]//The annual meeting of the American psychological association, New Orleans, LA, 1989.

[36] SENÉCAL C, JULIEN E, GUAY F. Role conflict and academic procrastination: a self-determination perspective [J]. European journal of social psychology, 2003, 33(1): 135-145.

[37] FERRARI J R, DÍAZ-MORALES J F. Procrastination: different time orientations reflect different motives [J]. Journal of research in personality, 2007, 41(3): 707-714.

[38] CHU A H C, CHOI J N. Rethinking procrastination: positive effects of "active" procrastination behavior on attitudes and performance [J]. Journal of social psychology, 2005, 145(3): 245-264.

[39] MIZRACHI D, BATES M J. Undergraduates'personal academic information management and the consideration of time and task-urgency [J]. Journal of the American society for information science and technology, 2013, 64(8): 1590-1607.

[40] JACQUES J, MA S, MAUREL D, et al. Organizing personal digital information: an analysis of faculty member activities [J]. Journal of documentation, 2020, 77(2): 401-419.

[41] HAJIBAYOVA L. Exploring individuals' patterns of personal information management practices: factors influencing the representation, organization and credibility assessment of information [J]. Information research, 2019, 24(3): paper 835.

[42] ALON L, NACHMIAS R. Gaps between actual and ideal personal information management behavior [J]. Computers in human behavior, 2020, 107: 106292.

[43] DINNEEN J D, JULIEN C A, FRISSE S I. The scale and structure of personal file collections [C]//Proceedings of the 2019 CHI conference on human factors in computing systems. New York: ACM, 2019: paper 327 (pp. 1-12).

[44] CHANG S J, KOM H. Behaviors of PIM in context of thesis and dissertation research [C]//CHI 2008 workshop. New York: ACM, 2008.

[45] HENDERSON S. How do people manage their documents? An empirical investigation into personal document management practices among knowledge workers [D]. Auckland: University of Auckland, 2009.

[46] OH K E. Personal information organization in everyday life: modeling the process [J]. Journal of documentation, 2019, 75(3): 667-691.

[47] BOARDMAN R, SASSE M A. "Stuff goes into the computer and doesn' t come out" : a cross-tool study of personal information management [C]//Proceedings of the SIGCHI conference on human factors in computing systems. New York: ACM, 2004: 583-590.

[48] JONES W. Keeping found things found: the study and practice of personal information management [M]. Burlington: Morgan Kaufmann Publishers, 2007.

[49] MASSEY C, TENBROOK S, TATUM C, et al. PIM and personality: What do our personal file systems say about us? [C]//Proceedings of the SIGCHI conference on human factors in computing systems. New York: ACM, 2014: 3695-3704.

[50] KWASNIK B H. How a personal document's intended use or purpose affects its classification in an office [C]//The 12th international conference on research and development in information retrieval. New York: ACM, 1989: 207-210.

[51] KWASNIK B H. The importance of factors that are not document attributes in the organization of personal documents [J]. Journal of documentation, 1991, 47(4): 389-398.

[52] BARREAU D K. Context as a factor in personal information management systems [J]. Journal of the American society for information science, 1995, 46(5): 327-339.

[53] ZHAN Nan. Research on influencing factors of researchers' personal academic information organization behavior [J]. Information Theory and Practice, 2016, 39(7): 67-73.

[54] LAY C H. At last, my research article on procrastination [J]. Journal of research in personality, 1986, 20(4): 474-495.

[55] FERRARI J R. Psychometric validation of two procrastination inventories for adults: arousal and avoidance measures [J]. Journal of psychopathology & behavioral assessment, 1992, 14(2): 97-110.

[56] LI Jing. The relationship among college students' perfectionism, self-control, and procrastination [D]. Guilin: Guangxi Normal University, 2015.

[57] CHOI J N, MORAN S V. Why not procrastinate? Development and validation of a new active procrastination scale [J]. The journal of social psychology, 2009, 149(2): 195-211.

[58] NI Shiguang, LI Hong, XU Jihong, et al. Revision and reliability/validity testing of the Active Procrastination Scale among Chinese college students [J]. Chinese Journal of Clinical Psychology, 2011, 19(4): 462-465.

[59] Chinese Psychological Society Educational Psychology Professional Committee. China Educational Psychology Assessment Manual [M]. Beijing: Higher Education Press, 2014.

[60] DEVELLIS R F. Scale development: theory and applications [M]. Newbury Park: Sage, 1991.

[61] JONES W, PHUWANARTNURAK A J, GILL R, et al. Don' t take my folders away! Organizing personal information to get things done [C]//CHI' 05 extended abstracts on human factors in computing systems. New York: ACM, 2005: 1505-1508.

[62] CORKIN D M, YU S L, LINDT S F. Comparing active delay and procrastination from a self-regulated learning perspective [J]. Learning and individual differences, 2011, 21(5): 602-606.

Author Contributions: Meng Gaohui: Literature review, data collection and analysis, and initial draft writing; Liu Chang: Research topic selection and

design guidance, manuscript revision and finalization.

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