

The Effect of Personality Traits on Knowledge Sharing in University Research Settings: Goal Orientation as a Mediating Variable Postprint

Authors: uniformly, Zhao Shukuan, Yu Haiqing, Li Qirong

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Abstract

[Purpose/Significance] Based on the Big Five personality traits theory and goal orientation theory, with learning orientation and performance orientation as mediators, this study constructs a model of the influence of personality trait differences among university teachers on knowledge sharing behavior. Explaining the impact of individual personality differences on knowledge sharing behavior from the perspective of personality traits and goal orientation helps universities better stimulate knowledge sharing behavior among university teachers in scientific research. [Method/Process] Through a questionnaire survey of 202 university teachers, a conceptual model influencing university teachers' knowledge sharing behavior was constructed, and hierarchical regression analysis and Bootstrap method were used for testing. [Results/Conclusion] Empirical results show that: conscientiousness and agreeableness both have significant positive effects on teachers' knowledge sharing behavior, while the effect of openness is not significant, with conscientiousness having the highest impact; learning orientation and performance orientation play a partial mediating role in the influence of personality traits on knowledge sharing behavior; compared with performance orientation, the mediating effect of learning orientation is stronger, indicating that teachers' learning motivation for knowledge sharing is stronger.

Full Text

Preamble

The Effect of Personality Traits on Knowledge Sharing in University Scientific Research: Goal Orientation as an Intermediary Variable

Qi Qi¹, Zhao Shukuan², Yu Haiqing², Li Qirong²

¹ School of Business Administration, Shandong University of Finance and Eco-

nomics, Jinan 250014

² School of Management, Jilin University, Changchun 130022

Abstract

[Purpose/Significance] Based on the Five-Factor Model of personality traits and goal orientation theory, this study constructs a model examining how university teachers' personality trait differences affect knowledge sharing behavior, with learning orientation and performance orientation serving as mediators. By explaining the influence of individual personality differences on knowledge sharing behavior from the perspectives of personality traits and goal orientation, this research helps universities better stimulate knowledge sharing behaviors among faculty in scientific research. **[Method/Process]** Through a questionnaire survey of 202 university teachers, a conceptual model influencing university teachers' knowledge sharing behavior was constructed and tested using hierarchical regression analysis and Bootstrap methods. **[Result/Conclusion]** Empirical results show that: (1) Both conscientiousness and agreeableness personality traits have significant positive effects on teachers' knowledge sharing behavior, while the effect of openness is not significant, with conscientiousness having the strongest impact; (2) Learning orientation and performance orientation partially mediate the relationship between personality traits and knowledge sharing behavior; (3) The mediating effect of learning orientation is stronger than that of performance orientation, indicating that teachers' learning motivation for knowledge sharing is more pronounced.

Keywords: personality traits, knowledge sharing, university scientific research, learning orientation, performance orientation

1. Introduction

Knowledge management is a crucial means for universities' sustainable development and enhancing core competitiveness, particularly under the backdrop of "Double First-Class" university construction in China, which emphasizes faculty research activities. Knowledge sharing behavior among knowledge workers serves as a key driver of effective knowledge management and organizational performance. As typical knowledge workers, faculty members represent a university's core assets, and knowledge sharing among them can promote collaboration and exchange in scientific research, thereby enhancing institutional competitiveness.

Knowledge sharing is a complex behavior influenced by various factors. At the individual level, reward-seeking is a key determinant, with intrinsic rewards (such as reputation and social approval) and extrinsic rewards (such as material benefits and invitations) both playing roles. Additionally, perceived risk-benefit

ratios and organizational commitment affect knowledge sharing. At the team level, member trust influences knowledge sharing through knowledge power trust and reciprocity, while team interaction and knowledge heterogeneity also exert effects. At the organizational level, leaders influence knowledge sharing through positional power and personal leadership styles (e.g., ethical leadership affects knowledge sharing by influencing employees' organizational identification and psychological safety). Cultural factors including corporate culture, traditional Chinese culture, and collectivist culture further shape knowledge sharing behaviors.

While personality traits can influence knowledge sharing behavior, research specifically examining how university teachers' personality differences affect knowledge sharing in scientific research contexts remains limited. International scholars have long studied personality traits' impact on knowledge sharing from an individual perspective, whereas domestic research in this area emerged relatively later. Individual behavior results from the interaction between personality and situational factors, where contextual elements may trigger or inhibit personality trait expression. Universities' decentralized organizational structures grant faculty considerable autonomy in scientific research. L.A. Witt et al. argue that not all personality traits affect knowledge sharing; conscientiousness, agreeableness, and openness possess strong social and cognitive attributes that play a central role in explaining workplace social behaviors. K. Matzler et al. empirically demonstrated that these three traits influence knowledge sharing. Therefore, examining how these three personality traits affect knowledge sharing in university research settings is warranted.

The mechanism through which personality traits influence knowledge sharing remains unclear. While organizational trust and social capital perspectives have been explored, research from individual motivation perspectives is lacking. Since individual behavior is motivated by personal goals, this study introduces goal orientation theory to investigate the mechanism linking faculty personality traits to knowledge sharing behavior in scientific research contexts, addressing a current research gap. This study uniquely integrates the Five-Factor Model and goal orientation theory, using learning and performance orientations as mediators to construct a conceptual model explaining how personality traits influence university teachers' knowledge sharing behavior.

2. Theoretical Foundation

2.1 Big Five Personality Theory

All levels of knowledge sharing require individual participation and are influenced by personality traits at the personal level. Personality trait theory explains individual differences in behavior and experiences. K. Matzler et al. found significant relationships between personality traits and knowledge sharing behavior. Subsequent research by Matzler et al. examined the mechanism from

an affective commitment perspective, showing that personality traits influence knowledge sharing through emotional commitment. Q. Lin et al. conducted experimental research with 481 randomly assigned university students across 67 groups, finding that personality traits explain variations in intra-team knowledge sharing behavior.

Domestic scholars have explored alternative mechanisms. Zhao Jun used organizational trust as a mediating variable, while Song Baoxiang and Lin Quan investigated individual self-worth as a mechanism. The Five-Factor Model represents the most widely accepted framework for classifying personality traits in individual behavior research, dividing personality into five dimensions: neuroticism, extraversion, agreeableness, openness, and conscientiousness. High extraversion correlates with greater social interaction and self-efficacy; neurotic individuals tend to be more sensitive, prone to inferiority, and less collaborative; agreeable individuals are helpful and cooperative; highly conscientious individuals demonstrate high execution capacity and proactive behavior; and openness traits exhibit flexibility and creativity.

Since conscientiousness, agreeableness, and openness possess strong social and cognitive attributes central to explaining workplace social behavior, this study focuses on these three traits' effects on university teachers' knowledge sharing in research contexts.

2.2 Goal Orientation Theory

Goal orientation originated in sociology and educational psychology in the 1970s and was introduced to organizational research in the 1990s. Widely accepted definitions frame goal orientation from a psychological achievement perspective—as individuals' or groups' desires for and reactions to achievement. Goal orientation theory provides an explanatory framework for adaptive or maladaptive self-regulatory behaviors, influencing self-cognition including effort, self-goal setting, self-efficacy, persistence, emotion, and learning strategies. This helps explain why some employees struggle to cooperate while others interact readily.

Goal orientation is multidimensional, with the most recognized division in organizational research being learning orientation versus performance orientation. Performance-oriented individuals believe ability is fixed and focus on demonstrating competence, while learning-oriented individuals believe ability is dynamic and can be improved through effort, focusing on developing new skills and mastering knowledge. They understand that substantial effort is necessary for new practices. The key distinction lies in performance-oriented individuals' focus on displaying ability evidence and expecting success with minimal effort, leading them to avoid appearing uncompetitive.

3. Hypothesis Development

3.1 Personality Traits and Knowledge Sharing

Agreeableness most likely facilitates experience transfer to organizational contexts. Highly agreeable individuals exhibit kindness, tolerance, courtesy, helpfulness, generosity, cheerfulness, and cooperation. These altruistic individuals sympathize with and eagerly assist others, seeking collaboration over competition. Research confirms that agreeableness influences work performance when collaboration is necessary. In university research, teacher exchange and cooperation build upon pleasant interpersonal relationships. Highly agreeable teachers tend to share research insights and experiences, establishing good collegial relationships. Therefore:

H1: University teachers' agreeableness personality trait positively influences knowledge sharing in scientific research.

Openness individuals display active imagination, aesthetic sensitivity, and independent judgment, focusing on inner emotions and preferring diversity. High-openness individuals are more curious, willing to consider new ideas, and more likely to transmit both positive and negative emotions to others. They possess strong curiosity, creativity, and flexible thinking, approaching novelties positively. In university research, high-openness teachers are curious about unknown or uncertain research areas and often seek others' help to achieve original results, suggesting greater engagement in knowledge sharing and seeking. Therefore:

H2: University teachers' openness personality trait positively influences knowledge sharing in scientific research.

Highly conscientious individuals are more dutiful, reliable, responsible, organized, hardworking, and achievement-oriented. Conscientiousness improves organizational citizenship behavior—contributions beyond role requirements and contractual rewards. Highly conscientious individuals tend to do what is expected of them. Knowledge sharing in research constitutes a form of organizational citizenship, so conscientious teachers possess the willingness and motivation to share knowledge. Therefore:

H3: University teachers' conscientiousness personality trait positively influences knowledge sharing in scientific research.

3.2 Mediating Roles of Learning and Performance Orientation

All knowledge sharing levels require individual participation, influenced by both personality traits and goal orientation. While goal orientation directly affects knowledge sharing, research shows personality traits influence personal goal orientation, which subsequently affects behavior. Learning and performance orientations influence learning processes and explain different individual learning strategies. Personal goals provide comparative frameworks for behavior, en-

hancing motivation for specific activities. Discrepancies between expected goals and actions trigger self-regulatory processes. Since personality trait differences determine distinct goal orientations that elicit different behaviors, personality traits affect knowledge sharing through goal orientation. Based on the university research context, we propose:

H4: Learning orientation mediates the relationship between personality traits and knowledge sharing behavior.

H4a: Learning orientation mediates the relationship between agreeableness and knowledge sharing.

H4b: Learning orientation mediates the relationship between openness and knowledge sharing.

H4c: Learning orientation mediates the relationship between conscientiousness and knowledge sharing.

H5: Performance orientation mediates the relationship between personality traits and knowledge sharing behavior.

H5a: Performance orientation mediates the relationship between agreeableness and knowledge sharing.

H5b: Performance orientation mediates the relationship between openness and knowledge sharing.

H5c: Performance orientation mediates the relationship between conscientiousness and knowledge sharing.

The research framework is shown in Figure 1 [Figure 1: see original paper].

4. Research Design

4.1 Variable Measurement

Personality Traits: Measuring Big Five personality traits requires well-developed, mature scales. We used the mini-IPIP (International Personality Item Pool), which evolved from a 50-item Big Five measurement pool. M.B. Donnellan et al. selected 20 items to measure the five personality traits. Research demonstrates this scale possesses good convergent validity, discriminant validity, and composite reliability compared to alternative Big Five measures.

Goal Orientation: Building on previous research, K. Matzler and J. Mueller refined the goal orientation scale, reducing both learning and performance orientations to three items each for application in organizational learning contexts. This study adapts their scale to measure goal orientation across both dimensions.

Knowledge Sharing: Numerous scales measure individual knowledge sharing behavior. Focusing on individual reactions to past knowledge sharing processes, this study adapts K. Matzler and J. Mueller's scale for measuring intra-organizational knowledge sharing behavior.

All construct items were measured using seven-point Likert scales (1 = very inaccurate, 7 = very accurate).

4.2 Data Collection

This study targeted university teachers, examining their knowledge sharing behavior in research work. The survey covered ten domestic universities (Jilin University, Northeast Normal University, Changchun University of Technology, Changchun Normal University, Renmin University of China, Qingdao University, Chinese People's Public Security University, etc.), representing various institutional tiers. Participants were formally employed teaching and research staff. An online survey platform distributed and collected questionnaires from May to September 2017, yielding 368 responses. Since the online platform could not control respondents' answering contexts or time, some questionnaires exhibited consecutive identical answers or contradictory responses to reverse-coded items, resulting in many invalid responses. After eliminating invalid questionnaires, 202 valid responses remained (54.89% valid response rate). Sample characteristics are shown in Table 1.

This study involved six variables with 22 measurement items, yielding an item-to-sample ratio of 1:9.18. R. Gorsuch recommends maintaining a ratio of at least 1:5, preferably 1:10. Although the final valid response rate was relatively low, the item-to-sample ratio far exceeded 1:5 and approached the 1:10 standard, ensuring no impact on research conclusions.

4.3 Descriptive Statistics

Descriptive statistics and correlation analysis appear in Table 2. All variables correlated significantly at the 0.01 level. Notably, openness correlated negatively with agreeableness ($\gamma = -0.612$), conscientiousness ($\gamma = -0.672$), learning orientation ($\gamma = -0.370$), performance orientation ($\gamma = -0.517$), and knowledge sharing ($\gamma = -0.486$, $p < 0.01$), while other variables showed positive intercorrelations.

5. Empirical Results

5.1 Reliability and Validity Testing

Using SPSS 23.0 and AMOS 24.0, confirmatory factor analysis assessed scale reliability and validity (Table 3). All variables achieved Cronbach's $\alpha > 0.7$, indicating excellent reliability. The measurement model demonstrated good

overall fit ($\chi^2/df = 1.79$, GFI = 0.868, CFI = 0.921, IFI = 0.922, RMSEA = 0.063). All standardized factor loadings exceeded 0.5 (range: 0.564-0.812) and were significant ($p < 0.001$), with composite reliability (CR) values > 0.7 , showing good convergent validity. Average variance extracted (AVE) assessed discriminant validity. Four of six variables achieved AVE > 0.5 , while openness and learning orientation approached 0.5. All AVE square roots (0.675-0.740) exceeded inter-variable correlations (Table 2), meeting C. Fornell and D.F. Larcker's criteria for high discriminant validity.

5.2 Hypothesis Testing

Hypothesis testing proceeded in two steps: (1) hierarchical regression tested personality traits' effects on knowledge sharing; (2) Bootstrap methods examined learning and performance orientation mediation.

Hierarchical regression first tested three personality types' effects on knowledge sharing behavior. Six models were specified: Model 1 regressed learning orientation on control variables and three personality traits; Model 2 regressed performance orientation; Models 3-6 regressed knowledge sharing, with Model 3 including controls and personality traits, Model 4 adding learning orientation, Model 5 adding performance orientation, and Model 6 including both orientations. Results appear in Table 4.

Model 3 shows that, controlling for age, tenure, gender, and position, agreeableness positively correlated with knowledge sharing ($\beta = 0.246$, $p < 0.01$), conscientiousness positively correlated ($\beta = 0.356$, $p < 0.001$), while openness negatively but non-significantly correlated ($\beta = -0.100$, $p = 0.234$). Thus, H1 and H3 are supported; H2 is not.

Three methods commonly test mediation: stepwise regression, Sobel test, and Bootstrap. D.P. MacKinnon et al.'s Monte Carlo research found stepwise regression has the lowest statistical power, while scholars generally consider Bootstrap more powerful. Therefore, this study used Bootstrap to test mediation, following J.R. Hayes's regression-based approach with 5,000 resamples and 95% confidence intervals. Results appear in Tables 5 and 6.

Learning Orientation Mediation: Controlling for demographics, the agreeableness-knowledge sharing indirect effect excluded zero [0.041, 0.179] with effect size 0.096, confirming learning orientation as a mediator. The direct effect remained significant [0.005, 0.303], indicating partial mediation (H4a supported). Similarly, learning orientation partially mediated conscientiousness-knowledge sharing (effect = 0.141; H4c supported). The openness-knowledge sharing indirect effect included zero [-0.016, 0.103]; H4b is not supported.

Performance Orientation Mediation: Controlling for demographics, the agreeableness-knowledge sharing indirect effect excluded zero [0.007, 0.121] with effect size 0.045, confirming partial mediation (H5a supported). Performance

orientation also partially mediated conscientiousness-knowledge sharing (effect = 0.091; H5c supported). The openness-knowledge sharing indirect effect included zero [-0.103, 0.013]; H5b is not supported.

5.3 Discussion

- (1) In university research contexts, conscientiousness and agreeableness significantly positively affect knowledge sharing, consistent with prior research but with conscientiousness showing stronger effects (H3: $\beta = 0.356$, $p < 0.001$; H1: $\beta = 0.246$, $p < 0.01$). Highly conscientious university teachers are more dutiful, reliable, and responsible, exhibiting organizational citizenship behaviors beyond role requirements by sharing research insights. Agreeable teachers demonstrate care for others and helpfulness, sharing experiences to gain reciprocity and advance collective learning.
- (2) Openness negatively and non-significantly correlates with knowledge sharing (H2: $\beta = -0.100$, $p = 0.234$), contrary to previous findings. This may stem from scientific research's inherent creative nature, which relies on individual originality and cognitive judgment, potentially conflicting with the collaborative nature of knowledge sharing, rendering openness unrelated to research knowledge sharing.
- (3) This study first confirms that goal orientation mediates personality traits' effects on knowledge sharing. Notably, learning orientation's mediating effect exceeds performance orientation's, indicating stronger learning motivation for knowledge sharing. Across personality research, trait effects on behavior invariably involve individual motivation. Goal orientation theory's learning and performance dimensions provide a self-regulatory framework: conscientious teachers exhibit greater responsibility and proactive learning attitudes between goal setting and action, facilitating knowledge sharing; agreeable teachers consider others more, desiring reciprocal learning and joint progress toward research goals.

6. Conclusions

Theoretical Contributions: Integrating Five-Factor Model and goal orientation theory, this study constructs a model of personality traits' effects on knowledge sharing, offering a novel perspective for university research contexts. Compared to Matzler et al.'s selection of openness, agreeableness, and conscientiousness, this study finds: (1) agreeableness and conscientiousness significantly positively affect knowledge sharing, consistent with Matzler et al., but openness shows no significant effect; (2) it first validates learning and performance orientations' mediating roles, explaining the mechanism and extending Matzler et al.'s framework—both orientations partially mediate conscientiousness's and agreeableness's effects, but with differing intensities.

Practical Implications: This research offers guidance for Chinese university research management: (1) When recruiting young PhDs, universities can assess personality traits alongside research achievements, attracting candidates with conscientious or agreeable traits; (2) Universities can improve research reward systems to enhance performance orientation while fostering organizational learning climates that encourage scientific collaboration and exchange, strengthening learning orientation to better align goals and actions and elevate research quality.

Limitations: (1) This study adopted foreign mature scales, whose applicability to Chinese samples warrants consideration; (2) Among Big Five traits, only three (agreeableness, openness, conscientiousness) were examined, excluding neuroticism and extraversion—though foreign research suggests these don't significantly affect knowledge sharing, Chinese contexts may yield different results; (3) The sample from ten universities is relatively small, potentially limiting representativeness. Future research should expand sampling scope.

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Author Contributions: Qi Qi: research framework construction, manuscript writing and revision; Zhao Shukuan: research topic proposal; Yu Haiqing: literature collection and organization, proofreading; Li Qirong: literature collection and organization, proofreading.

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

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