澳門大學
UNIVERSIDADE DE MACAU
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教育學院
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# ETARC Newsletter

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教育測驗與評核研究中心
Educational Testing and Assessment Research Centre

# Content

# Message from Director

Xiufeng LIU

Welcome to this new edition of The Educational Testing and Assessment Research Center (ETARC) Newsletter.

Since September 2025, ETARC has been continuing its missions to advance scholarship, cultivate talents and serve communities and professions. In terms of scholarship, ETARC faculty are actively involved in a variety of projects, with some being funded by the Macao government and University of Macau; they are also presenting at international conferences and publishing in top international journals. ETARC faculty are also engaged in various forms of teaching and mentoring students and the next generation of scholars. Last but not least, ETARC faculty are providing critical services to the Macao government such as conducting international assessment programs, consulting for organizations in Macao, the greater bay area, and mainland China, and editing academic journals as editors and associate editors. In November 2025, we successfully hosted the International Forum on Frontiers in Educational Assessment. I invite you to read this newsletter to find more about the center's most recent activities and achievements.

Looking forward to the spring semester, we are planning a variety of activities including statistics and measurement workshops, academic talks, and student study tours. Please take advantage of the various opportunities ETARC offers to get involved with our center.

Best wishes for the spring semester!
Xiufeng Liu, PhD
Chair Professor and Director, ETARC

# Welcome New Faculty

We are delighted to welcome Prof. Dong Nguyen as Associate Professor of Educational Leadership & Management to join ETARC, Faculty of Education, University of Macau, effective January 2026. Prof. Nguyen brings an extensive international academic and professional background, beginning with his BA in English Language Teaching from Vietnam National University, Hanoi, in 2007, followed by MA in International and Comparative Education from Stockholm University, Sweden, in 2012. He earned his PhD in Educational Leadership at Nanyang Technological University, Singapore, in 2018, and later completed a Postgraduate Certificate in Academic Practice at the University of Glasgow, UK, in 2022.

Prior to joining the University of Macau, Prof. Nguyens career spanned diverse global institutions: he served as a High School Teacher at Vietnam National University, Hanoi (2008 – 2013), held a Research Associate position at Nanyang Technological University (2013), and later joined the University of Glasgow as a Postdoctoral Research Associate (2017 – 2018) and Lecturer (2018 – 2022). He most recently held the position of Associate Professor at Durham University, UK (2022 – 2026).

An internationally recognized scholar, Prof. Nguyen's research explores educational leadership and management across sectors, nations, and cultures; leadership and professional development; the diffusion of innovations; and the critical intersection of management, organization, and technology in education.

# Updates on PISA 2025, PIRLS 2026, and TIMSS 2027

PISA 2025 has successfully concluded the main study; Data cleaning has also been completed. Data analysis is currently underway, and reports are scheduled to be released in late 2026. The following FED faculty contributed to PISA 2025 as subject experts: Chun Wai CHENG, Fu CHEN, Chunlian JIANG, Chun Seng KAM, Si Man LEI , Manuel NORONHA, Emily Pey-Tee OON , Yan WANG, Jin-Jy SHIEH, Pou Seong SIT, Min-Chuan SUNG, Ming Wai WONG, Bing WEI, Mei Jiun WU, and Shulin YU.

PIRLS 2026 has completed main study instrument translation and is getting ready for the main study in May 2026. The following FED faculty contributed to PIRLS 2026 as subject experts: Fu CHEN, Chun Wai CHENG, Kwok C. CHEUNG, Yang GONG, Manuel NORONHA, Pou Seong SIT, Jin-Jy SHIEH, Min-Chuan SUNG, and Shulin YU.

TIMSS 2027 has just completed field-testing instruments (questionnaires, achievement assessment items) translation and verification. The project team is currently conducting training for school field-test coordinators, and teacher proctors. The following FED faculty contributed to TIMSS 2027 as subject experts: Kwok Cheung CHEUNG, Chunlian JIANG, Emily Pey-Tee OON, Pou Seong SIT, Xiaowei Tang, Bing Wei, and Xinrang Yang.

# ETARC Faculty Current Projects and Recent Publications

**Fu CHEN**

**Publications:**

Wang, C., Lu, C., Chen, F., Liu, X., & Wang, Q. (2025). Assessing computational thinking beyond programming: A scoping review of non-programming-based computational thinking assessments for K-12 education. *Journal of Computer Assisted Learning*.

Li, X., Chen, F., & Lu, C. (2025). Internet usage inequality among high school students: Patterns, motivational predictors, and educational outcomes. *Computers & Education.*

Tan, L., Wei, B., & Chen, F. (2025). An exploratory process mining on students' complex problem-solving behavior: The distinct patterns and related factors. *Computers & Education.*

Wang, Q., Lu, C., Chen, F., Liu, X., & Zhao, Q. (2025). Exploring the complex interplay among middle schoolers' prior coding experience, computational thinking attitudes and skills: A multiple moderated mediation analysis. *Journal of Research on Technology in Education.*

Chen, F., Liu, Y., Lu, C., Gao, Y., & Cui, Y. (2025). Does ICT matter for student complex problem-solving competency? A multilevel analysis of 33 countries and economies. *Thinking Skills and Creativity, 57*, 101805.

**Luyang GUO**

**Projects:**

1. Digital divide and science career expectations;
2. Longitudinal development of educational and career aspirations;
3. The social emotional skill development of vocational students.

**Publications:**

Li, Y., Guo, L. Parent-Adolescent Congruence and Incongruence in Parental Involvement and Academic Achievement: The More, the Better?. J. *Youth Adolescence 54*, 2894–2908 (2025). https://doi.org/10.1007/s10964-025-02245-1

**Xin GUO**

**Projects:**

1. 15-Year Longitudinal Revisit and Follow-Up Study on Female Leadership: Rural Female Principals Promoted via China's Largest UK DFID Education Aid Project, Examining Individual Agency and the Impacts of Complex Temporal-Institutional Contexts on Project Sustainability
2. Institutional Innovation Space in Chinese Public Schools: A Case Study of an Innovative Reform-Oriented Public School, Examining Principals' Institutional Work Under Contemporary Accountability Regimes
3. Development and Enhancement of Middle-Level Leadership in Chinese International Education Contexts
4. Transformational Practices and Sustainability of Knowledge Production Paradigms in Higher Education: An Empirical Investigation
5. The Performativity in Chinese Undergraduates' Academic Learning Experiences
6. The Professional Doctor of Education (Ed.D.) Program as a Higher Education Institutional Innovation: In Search of the "Third Space" Between "Highlands" and "Swamps"

**Conference:**

Conference: **The 2nd Peking University Forum on High-Quality Development of the Doctor of Education (EdD) Program**
Topic: Between "Highland" and "Marsh": Positioning, Reflection and Prospect of the Doctor of Education (EdD) Program
Conference: **The 11th National Symposium on Educational Anthropology and Election of New Council**
Topic: Breaking the Glass Ceiling and Its Sustainability: A Multilevel Analysis of the Sustainability of Female Leadership in Rural Chinese Education

**Mark Hok Chio LAI**

**Projects:**

1. A Two-Stage Approach to Account for Measurement Error When Using Empirical Bayes Estimates of Random Slopes;
2. Penalized Estimation for Longitudinal Factor Models;
3. Bayesian Estimation of the Univariate ACE Twins Model With STAN.

**Publications:**

Feter, N., Nanda, A., Hourihan, S., Aslan, D., Feter, J., Duncan, B., Schmidt, M. I., Sayre, M. K., Bharadwaj, P. K., Ally, M., Song, H., Amra, A., Maltagliati, S., Lai, M. H. C., Wilcox, R. R., Klimentidis, Y. C., Alexander, G. E., & Raichlen, D. A. (2025). Associations between distinct sedentary behaviors with dementia risk and brain structure: Findings of the ARIC Study. *Alzheimer's & Dementia, 21, 56*(e103655).

Aslan, D. H., Fenton, L., Han, S. D., Lai, M. H. C., Luong, D. M., Markarian, T., Seshadri, A., Alexander, G. E., & Raichlen, D. A. (2025). Cognitive correlates of human endurance. Proceedings of the National Academy of Sciences, 122(47), e2512055122. Raichlen, D. A., Aslan, D. H., Sayre, M. K., Nanda, A., Bharadwaj, P. K., Ally, M., Maltagliati, S., Lai, M. H. C., Wilcox, R. R., Klimentidis, Y. C., & Alexander, G. E. (2025). Associations between the 24-hour activity daily cycle and incident dementia. *Medicine & Science in Sports & Exercise, 57*(9), 1897-1904.

Ozcan, M., & Lai, M. H. C. (2025). Exploring the impact of deleting (or retaining) a biased item: A procedure based on classification accuracy. *Assessment, 32*(8), 1211–1225.

# ETARC Faculty Current Projects and Recent Publications

**Chester Chun Seng KAM**

**Projects:**

1. Methods of detecting careless respondents in psychological surveys.

**Publications:**

Zhai, J., Sun, R., Lam, L. W., Kam, C. C., Chark, R., & Wu, A. M. (2025). Work Hard, Use Harder? The Longitudinal Association Between Work Addiction and Social Media Addiction in Full-Time Workers by a Cross-Lagged Panel Network Analysis. *Cyberpsychology, Behavior, and Social Networking, 28*(11), 740-748.

**Xiufeng LIU**

**Projects:**

1. **Advanced Statistical Analysis and Data Mining of large-scale International STEM Assessment Datasets**: This project involves using PISA 2022 dataset, particularly creative thinking test dataset, to answer the following research questions: (a) Which variables are significant predictors of students' CPS? (b) What interaction patterns exist among cognitive components in predicting CPS? What interaction patterns exist among affective components? (c) How might cognitive, affective, and environmental components interact to influence CPS?
2. ***D*evelopment, Validation, and Application of a K-12 Student STEM Literacy Measurement Instrument**: This project is developing a STEM literacy framework (systematic literature review, ontology), defining STEM literacy Progress Variable (phenomenography), and developing and validating measurement instruments to measure K-12 students' STEM literacy (Rasch modeling).
3. **American and Chinese Expert Science Teachers' Identity and Comparison**: Through qualitative interview and survey, this project will answer the following research questions: (a) What are identity characteristics of expert science teachers in the U.S. and China (grounded theory study)? And (b) How do identity characteristics of expert science teachers in the US and China compare? (survey study).

**Publications:**

Liu, X., Beverley, J., Cheung, Y., & Tripp, J. N. (2026). Advancing STEM education research with ontology. *Disciplinary and Interdisciplinary Education Research, 8:1*,https://doi.org/10.1186/s43031-025-00153-9.

Liu, X., Bryan, L., Erduran, S., Fortus, D., Li, Y., Lin, J., & Roehrig, G. (in press). STEM Literacy: A position statement. Journal of Science Education and Technology.

Tripp, J., & Liu, X. (in press). Measurement of student STEM identity: A systematic literature review. Educational Research Review.

**Weicong LYU**

**Projects:**

1. Recent Project: Regularized DIF Detection in Multidimensional Graded Response Models
2. Identifying Causes of Test Unfairness: Manipulability and Separability
3. Possible Solutions to Heywood Cases in Confirmatory Factor Analysis

**Publications:**

Suk, Y. & Lyu, W. (in press). Rethinking item fairness using single world intervention graphs. *Journal of Educational and Behavioral Statistics.*

Ren, H., Lyu, W., Wang, C., & Xu, G. (2025). A novel method for detecting intersectional DIF: Multilevel random item effects model with regularized Gaussian variational estimation. Psychometrika. https://doi.org/10.1017/psy.2025.10046

Lyu, W., Wang, C., & Xu, G. (2025). Detecting differential item functioning across multiple groups using group pairwise penalty. *Psychometrika, 90*(5), 1594–1621. https://doi.org/10.1017/psy.2025.10034

**Jin-Jy SHIEH**

**Publications:**

Shieh, J. J. (2025). The Current status and challenges of implementing issue integration in elementary schools: Perspectives from principals and teachers. *Taiwan Educational Review Monthly, 14*(10), 32-38. (ISSN 2225 7209) (Written in Chinese)

Shieh, J. J. (2026). The impact of World University Rankings on higher education. *Taiwan Educational Review Monthly, 15*(1), 45-52. (ISSN 2225 7209) (Written in Chinese)

Shieh, J. J. (2026). Content analysis of learning assessment policies in higher education institutions: A study of the top ten universities in the QS (Quacquarelli Symonds) 2025 World University Rankings. *Journal of Taiwan Education Studies, 7*(1), 99-129. (Written in Chinese)

# ETARC Faculty Current Projects and Recent Publications

**Jing SUN**
**Projects :**
1. Admissions policies' flexibility in China's "Double First-Class" universities—An analysis based on grounded theory;
2. Gaokao comprehensive reform and Intergenerational Mobility: Empirical evidence based on CFPS.

**Sou Kuan VONG**
**Projects :**
1. The Historical Trajectory of the Macao School Curriculum;
2. Social Spatiality in Social Education Textbooks: A Textual Analysis;
3. Spatial Justice and Children's Right to Play in Macao Nurseries;
4. An Oral History Study of a Catholic School.

**Mei Jiun WU**
**Projects :**
Factors behind academic success of students in Macau and around the globe.

# Ten-Thousand Talent Project

A delegation of two faculty members (Profs. Luyang Guo and Weicong Lyu) and 10 master's and doctoral students from FED participated in the "6th University of Macau and Beijing Normal University Education Evaluation and Monitoring Talent Exchange Program" at the Zhuhai Campus of Beijing Normal University from December 27 to 30, 2025..

Since its inception in 2020, this talent exchange program has been successfully held for six consecutive sessions. As a vital platform for the Centre's external academic exchange, the project has played a significant role in improving education evaluation and monitoring systems and exploring effective pathways for talent cultivation. Furthermore, it has achieved substantial progress in driving the conceptual transformation and technological upgrading of educational assessment in both regions.

The theme of this year's exchange program was "Talent Exchange in Education Evaluation and Monitoring." During the four-day event, faculty and students from FED engaged in in-depth dialogues with faculties and students from Beijing Normal University, focusing on conceptual innovation, methodological reform, and practical exploration in the field of educational assessment. Through this exchange, the faculty and students of the Centre have further broadened their academic horizons.

# 2025 International Forum on Frontiers in Educational Assessment

In alignment with the "Development of the Guangdong-Hong Kong-Macao Greater Bay Area", the "2025 Annual Meeting of the Guangdong-Hong Kong-Macao EducationQuality Monitoring and Evaluation Alliance and the International Forum on Frontiers in Educational Assessment" was successfully held at the University of Macau from November 22 to 24, 2025. Hosted by ETARC and co-organized by the Collaborative Innovation Center of Assessment for Basic Education Quality at Beijing Normal University and the Faculty of Education at The Chinese University of Hong Kong, the event marked the third annual meeting of the Alliance.

The forum addressed critical themes, including emerging theories and methodologies in educational assessment, technological applications in evaluation, the design and implementation of large-scale assessments, the measurement of emerging competencies, and policy frameworks for education quality monitoring. The event attracted over 170 registered participants—including scholars, researchers, and graduate students—from prestigious institutions across Mainland China, Hong Kong, Macao, and overseas, such as Peking University, Beijing Normal University, East China Normal University, and the Education University of Hong Kong.

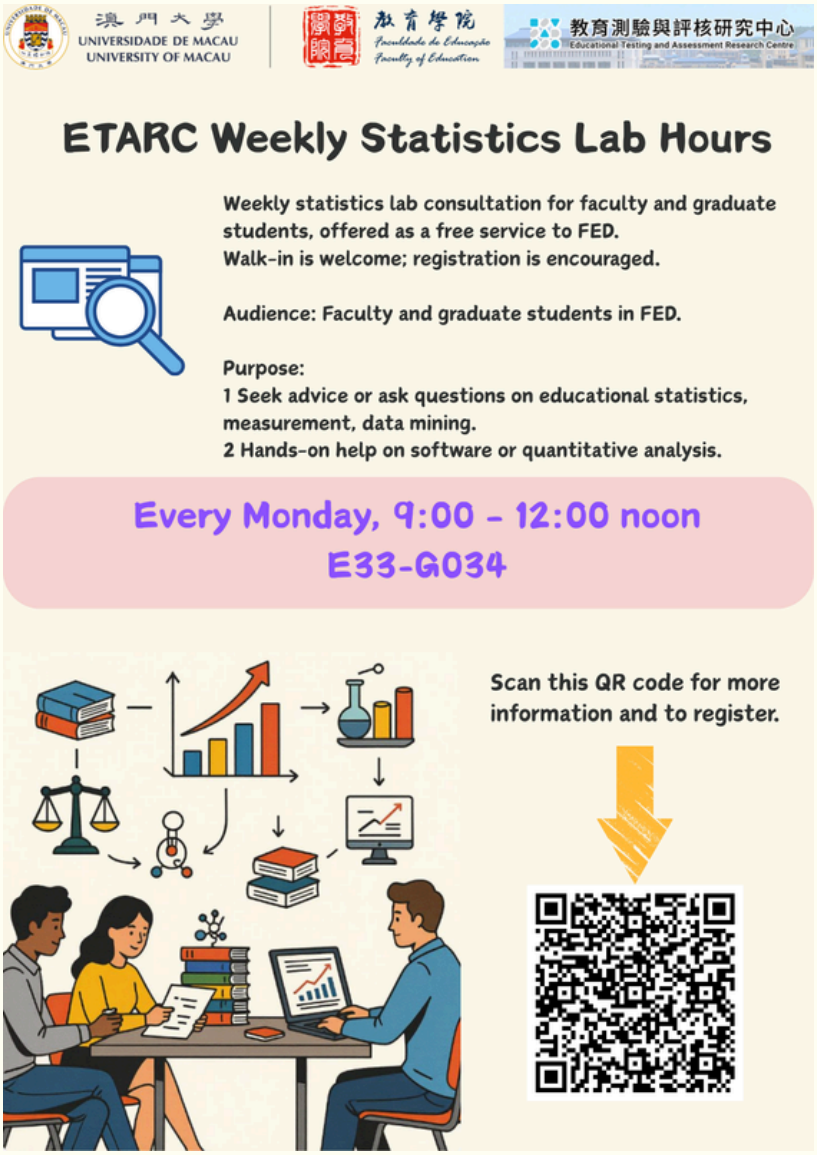
In his opening remarks, Professor Fan Lianghuo, Dean of UM FED and Director of the Centre for Science and Artificial Intelligence Education, emphasized that artificial intelligence is fundamentally reshaping the tools and methods of educational assessment. This sets the stage for 11 keynote presentations delivered by distinguished global experts. The speaker lineup featured leading scholars from the Educational Testing Service (ETS), the University of Alberta, Boston College, and the University of Georgia, alongside top-tier academics from CUHK, BNU, and UM. Their presentations delved into cutting-edge topics such as the application of generative AI in assessment, the concept of "integrating teaching/learning and assessment," non-cognitive competency measurement, and advanced psychometric algorithms for complex data. These high-level dialogues not only showcased the assessment research frontiers but also provided vital theoretical guidance for the future of education quality monitoring.

In addition to the keynotes, three specialized workshops led by senior experts were well-attended. . By combining expert demonstrations with hands-on practice, these sessions provided participants with actionable technical pathways and innovative research tools. Furthermore, more than 20 scholars from different universities across the country delivered presentations in various parallel sessions, fostering a vibrant and intellectually stimulating atmosphere for academic exchange. The high level of interactivity strong recognition, significantly enhancing the technical capabilities of educational assessment professionals and laying a solid foundation for future regional collaboration.

# ETARC Weekly Lab Hours

As a service to FED, we are pleased to continues offer a weekly statistics lab consultancy for faculty and graduate students. The lab hours will be every Monday, 9:00 – 12:00 noon, in G034. Dr. Shuaishuai Mi, a postdoc researcher of Prof. Xiufeng Liu, will be available during the time. Faculty and graduate students who have questions or want to seek advice on educational statistics, measurement, data mining, etc., may come during the lab hours to work with Dr. Mi individually.

Although no registration is required and walk-in is welcome, advance registration will ensure that no other faculty or graduate students may come at the same time. Please contact Zhen Chen at MC44160@um.edu.mo to reserve your time.



# International Research Collaboration Opportunities

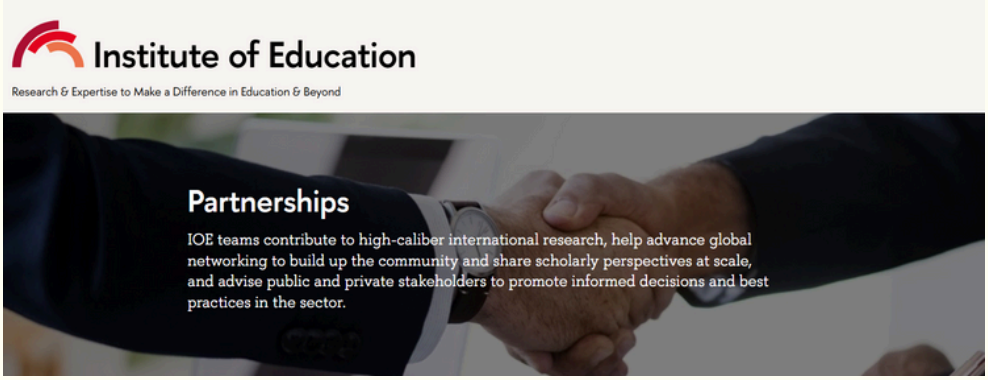
The Centre for Psychometrics and Measurement in Education of the Institute of Education, National Research University Higher School of Economic of Russia (https://www.hse.ru/en/) is inviting collaborators for the following research projects:

1.Assessment of AI literacy.

2.Assessment of critical thinking.

3.Assessment of self-regulation.

If you are interested in collaborating in any of the projects, please contact Xiufeng Liu at xiufengliu@um.edu.mo. Prof.Liu will connect you with the pertinent researchers of the university.




# Call for Contributions

**ETARC annual publication call for contributions**

ETARC will launch an annual publication, *Advances in Educational Assessment*. This publication is intended for practitioners (e.g., schoolteachers, university faculty, principals, government officers). It will feature new assessment methods and techniques that are relevant to K-12 and universities. All faculty and graduate students are welcome to contribute. Each contribution will be 1-3 pages. The publication will be open-access and based on the Creative Common license. The publication will have an ISBN number. Contributions to the publication should be sent to Zhen Chen at MC44160@um.edu.mo by April 30th, 2026. The publication will be made available in both English and Chinese in June, 2026.

# Upcoming Workshops

## HLM workshop --- Prof. Chester Chun Seng KAM
01/30/2026

This hands-on Hierarchical Linear Modeling (HLM) workshop is designed for master's and doctoral students and faculty interested in analyzing nested data structures—such as students within classrooms or individuals within sports teams—commonly encountered in educational, psychological, and social science research. Using SPSS, a widely accessible software in the social sciences, participants will engage in practical activities including a brief review of regression, exploration of random effects, and specification of random-intercept models.

## Seminar on "Assessing Student Socioscientific Issues Learning" --- Prof. LIN Jing
02/02/2026

This presentation draws on a six-year research project in Mainland China to examine how students' core competencies, including interdisciplinary skills, epistemic understanding of science, and scientific identity, can be assessed in socioscientific issues (SSI) learning contexts. SSI are real-world, interdisciplinary problems with uncertain solutions, providing a meaningful setting for students to integrate knowledge, engage in scientific practices, and reflect on the nature of science. The study employs multidimensional formative assessment to track students' interdisciplinary skills, epistemic knowledge of science, and scientific identity development. Findings show that well-designed assessment practices can make learning visible and support deeper engagement with complex issues.

## IRT workshop --- Prof. Weicong LYU
02/06/2026

Item Response Theory (IRT) offers superior, invariant estimates of abilities and item parameters compared to Classical Test Theory, improving validity and precision in assessments. This interactive workshop covers core IRT principles and their application in R, including:

1 Foundations of item response models and advantages over classical approaches;
2 Step-by-step implementation of the Rasch and 2PL models;
3 Overview of extensions like polytomous models and differential item functioning (DIF) for measurement invariance.

Through exercises, participants will evaluate item properties, estimate latent traits accurately, detect bias, and enhance instrument quality. By the end, attendees will be ready to apply IRT independently in their research.

## More Workshops are being planned:

| Time | Topic | Speaker |
|---|---|---|
| March | Secondary analysis of large-scale assessment data | Prof. Luyang GUO |
| April | Structure Equation Modeling | Prof. Mark Lai |
| May | Developing measurement instruments using Rasch modeling | Prof. Xiufeng Liu |

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