

13.学术写作中的图表与统计叙事整合策略

White Paper

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Contents

Contents	2
一、引言 Introduction	3
二、图表类型与功能 Types and Functions of Figures and Tables	3
三、统计叙事原则 Principles of Statistical Narratives	4
四、图表与文字的整合策略 Strategies for Integrating Figures/Tables with Text	4
五、统计结果表达技巧 Techniques for Reporting Statistical Results	5
六、图表设计优化原则 Figure Design Principles	5
七、表格设计优化原则 Table Design Principles	5
八、图表与论文结构的匹配 Aligning Figures and Tables with Manuscript Structure	6
九、跨学科图表策略 Cross-Disciplinary Figure Strategy	6
十、AI辅助图表与统计叙事 AI-Assisted Figures and Statistical Narrative	6
十一、常见错误及规避 Common Errors and Avoidance	7
十三、案例示范 Example Case	7
十四、结论 Conclusion	8

一、引言 | Introduction

【中文】图表与统计结果是学术论文的核心证据载体。有效的整合不仅能增强论文可读性和可信度，还可以使审稿人快速理解研究结果。然而，常见问题包括：图表堆砌、统计报告不清晰、与文字叙事脱节。本白皮书提出系统策略，指导作者在写作中无缝整合图表、统计分析与文字叙事。

【English】 Figures, tables, and statistical results are the primary evidence in academic papers. Effective integration enhances readability and credibility and allows reviewers to quickly grasp results. Common issues include figure overload, unclear statistical reporting, and disconnect between text and visuals. This white paper provides systematic strategies to seamlessly integrate figures, statistical analyses, and textual narratives.

二、图表类型与功能 | Types and Functions of Figures and Tables

【中文】

类型	功能	使用策略
表格 (Table)	精确呈现数据	用于数字、分类变量、比较
条形图/柱状图	组间比较	简洁、突出差异
折线图	趋势变化	显示时间序列或连续变化
散点图	相关分析	可标示回归线或趋势线
箱线图	分布与离群值	展示中位数、四分位数及异常值
热力图/矩阵图	复杂关系	显示相关性或多变量关系

【English】

Type	Function	Strategy
Table	Present precise data	use for numeric, categorical, or comparative data
Bar/Column chart	Group comparison	keep simple, highlight differences
Line chart	Trend analysis	show time series or continuous change
Scatter plot	Correlation analysis	add regression or trend line
Box plot	Distribution & outliers	display median, quartiles, and outliers

Heatmap/Matrix	Complex relationships	show correlations or multivariate relationships
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三、统计叙事原则 | Principles of Statistical Narratives

【中文】

清晰性：统计量、效应值、置信区间必须明确

简明性：只报告关键结果，不列全部输出

一致性：文字叙述与图表数据保持一致

可理解性：非专业读者可通过文字理解图表含义

因果与相关区分：避免过度解释统计结果

【English】

Clarity: report statistics, effect sizes, and confidence intervals clearly

Conciseness: report only key results, not the full output

Consistency: textual narrative must match figure/table data

Comprehensibility: non-specialists should understand figures via text

Correlation vs causation: avoid over-interpreting statistical outcomes

四、图表与文字的整合策略 | Strategies for Integrating Figures/Tables with Text

【中文】

先描述，后引用：文字先解释数据意义，再指向图表

突出关键差异：在文字中标明统计显著或效应大小

编号与标题明确：图表编号与标题便于快速查找

交叉引用：文字、图表、公式、附录需统一编号

局部解释：图表不必讲完故事，文字承担解读功能

【English】

Describe first, then reference: text explains meaning before pointing to figure

Highlight key differences: mention significance or effect size in text

Clear numbering and captions: facilitate quick navigation

Cross-reference: unify numbering for text, figures, tables, appendices

Partial explanation: figures show data, text interprets

示例 | Example

中文：干预组在第4周PSS评分显著下降（见图2， $p < .01$ ）。

English: Parental stress scores significantly decreased in the intervention group at week 4 (see Figure 2, $p < .01$).

五、统计结果表达技巧 | Techniques for Reporting Statistical Results

【中文】

明确统计方法：t检验、ANOVA、回归等

报告统计量和效应值： $t(58)=3.21, d=.42, p < .01$

使用置信区间：95% CI [.21, .63]

避免仅报告p值

【English】

Specify statistical methods: t-test, ANOVA, regression

Report statistics and effect sizes: $t(58)=3.21, d=.42, p < .01$

Include confidence intervals: 95% CI [.21, .63]

Avoid reporting only p-values

六、图表设计优化原则 | Figure Design Principles

简洁性：删除多余网格、标签、颜色

对比突出：重要信息加粗或高亮

颜色选择：考虑色盲及黑白打印可读性

单位标注：明确横纵轴单位

自解释：标题和图例足以理解图表内容

七、表格设计优化原则 | Table Design Principles

行列逻辑清晰

标题简洁但信息完整

数据对齐统一（数值右对齐）

避免重复文字

适当使用合并单元格提高可读性

八、图表与论文结构的匹配 | Aligning Figures and Tables with Manuscript Structure

【中文】

方法部分图表：展示实验设计、样本特征

结果部分图表：呈现主要统计结果

附录或补充材料：复杂分析或完整数据

图表顺序与正文逻辑一致

【English】

Methods section figures: experimental design, sample characteristics

Results section figures: key statistical outcomes

Appendices/supplementary: complex analyses or full datasets

Ensure figure/table order aligns with text logic

九、跨学科图表策略 | Cross-Disciplinary Figure Strategy

使用易懂符号与单位

提供简短说明或注释

避免仅使用本学科约定符号

强调可迁移性和可比较性

十、AI辅助图表与统计叙事 | AI-Assisted Figures and Statistical Narrative

【中文】

AI可生成图表草稿、趋势图和统计摘要

必须人工验证数据正确性和图表精确度

保证统计叙事与论文逻辑匹配

【English】

AI can draft figures, trend charts, and statistical summaries

Human verification of data and figure accuracy is essential

Ensure statistical narrative aligns with manuscript logic

十一、常见错误及规避 | Common Errors and Avoidance

图表无编号或标题模糊

图表与文本数据不一致

图表过多导致信息冗余

统计结果缺失效应量或置信区间

颜色或格式导致可读性下降

检查表 | Checklist

每个图表都有编号和清晰标题

Each figure and table should have a number and a clear, descriptive title.

图表与文本叙事一致

Ensure consistency between figures/tables and the textual narrative.

关键统计信息清晰呈现

Present key statistical information clearly.

图表设计简洁、可读

Design figures and tables to be simple and highly readable.

文字中突出核心发现

Highlight the core findings clearly within the text.

数据可量化，效果值或置信区间明确

Ensure data are quantifiable, with effect sizes and/or confidence intervals clearly reported.

AI生成内容已校验

All AI-generated content has been carefully verified.

图表顺序与正文逻辑匹配

十三、案例示范 | Example Case

原文描述（不佳）

显示组间差异。

修改后

中文：显示干预组在第4周PSS评分显著下降（ $t(58)=3.21, d=.42, p<.01$ ），对照组变化不显著。

English: a significant decrease in parental stress scores at week 4 in the intervention group ($t(58)=3.21, d=.42, p<.01$), with no significant change in controls.

十四、结论 | Conclusion

【中文】图表与统计叙事的整合，是学术论文质量提升的核心环节。通过结构化设计、简洁呈现、统计规范、文字解读和AI辅助验证，作者可以实现“图表讲得清、文字讲得明”，提升论文可读性、可信度和审稿通过率。

【English】Integrating figures, tables, and statistical narratives is crucial for high-quality manuscripts. Through structured design, concise presentation, statistical rigor, textual interpretation, and AI-assisted verification, authors can ensure “figures speak clearly, text explains thoroughly,” enhancing readability, credibility, and likelihood of acceptance.

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