北京師範大學
BEIJING NORMAL UNIVERSITY

Study on the Difference between Summary Peer Reviews and Abstracts of Scientific Papers

Chong Chen, Jingying Zhang, Xiaoyu Chu, Jinglin Zheng
School of Government
Beijing Normal University

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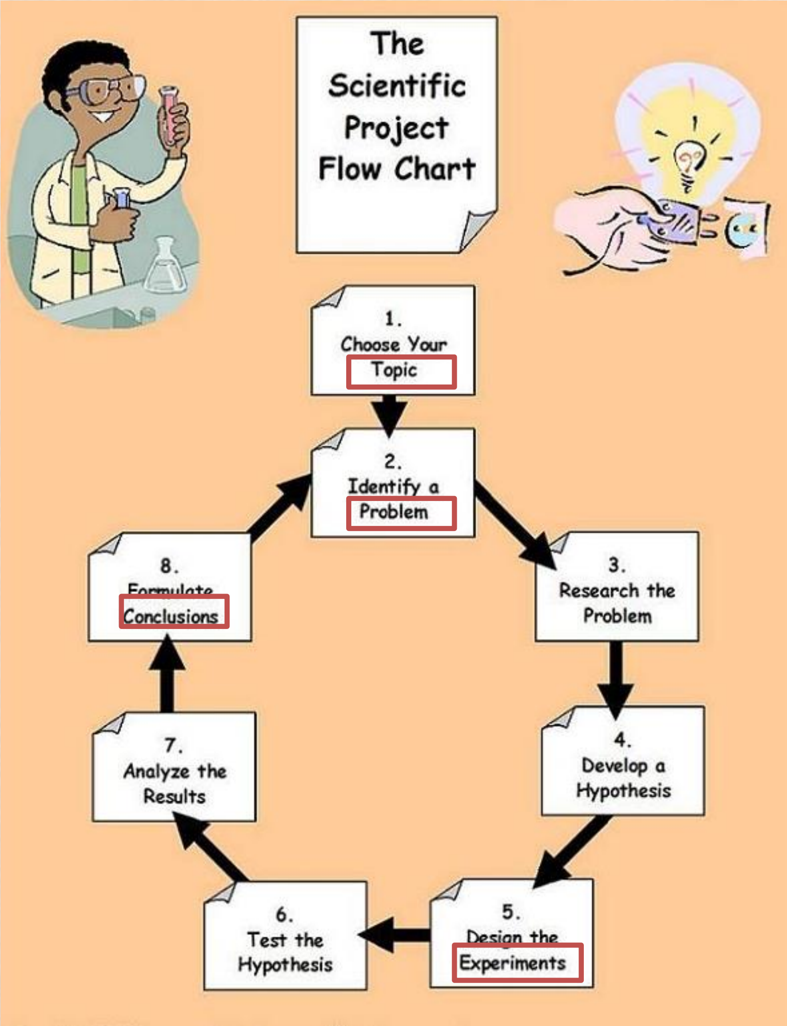
Research Background


The Scientific Project Flow Chart
1. Choose Your Topic
2. Identify a Problem
3. Research the Problem
4. Develop a Hypothesis
5. Design the Experiments
6. Test the Hypothesis
7. Analyze the Results
8. Formulate Conclusions

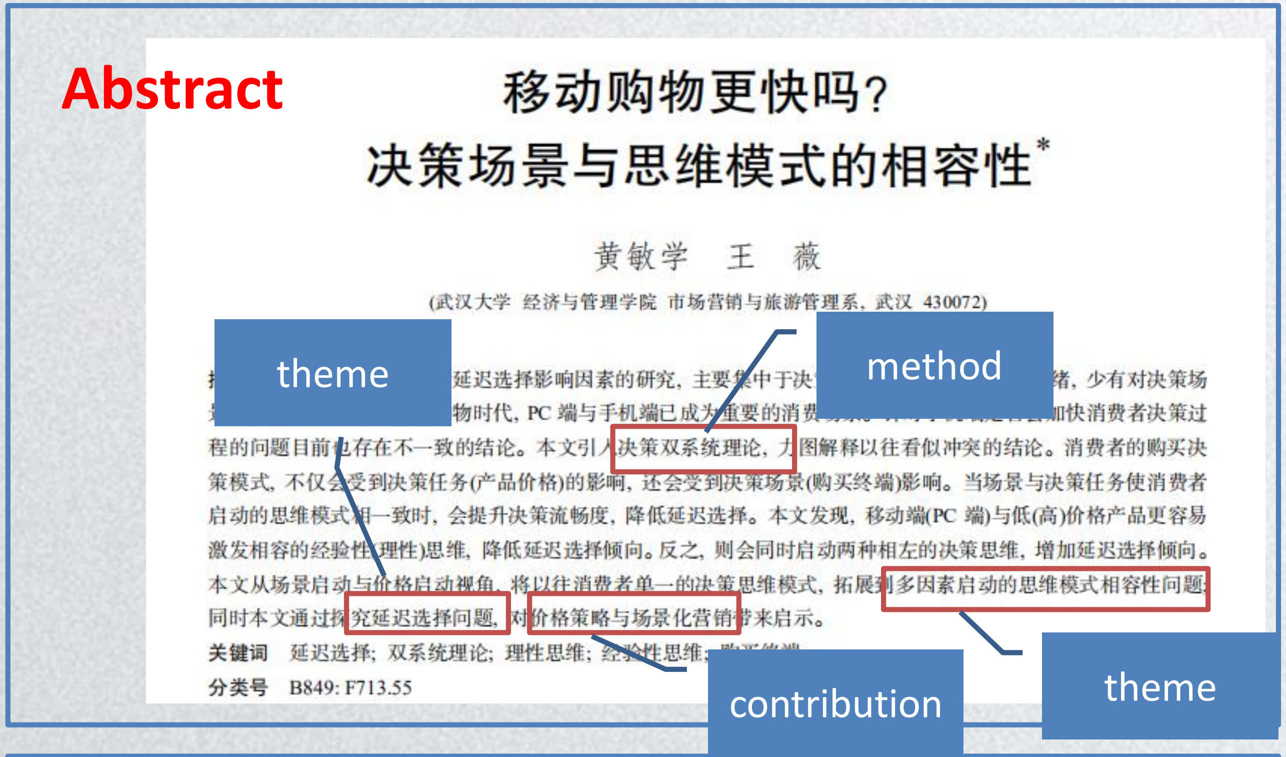
- **Functional components**[1] **-** content of different semantic function helping to reveal the critical information of a paper.
  - the research purpose, the problem definition, methods, experiments, contributions...

- Clear function components can help reduce the burden of reading.

[1] Wei Lu, Yong Huang, Yi Bu, Qikai Cheng. 2018. Functional structure identification of scientific documents in computer science[J]. Scientometrics, 115(1): 463-486.

Research Background

Abstract



移动购物更快吗？

决策场景与思维模式的相容性*

黄敏学　王　薇

(武汉大学　经济与管理学院　市场营销与旅游管理系，武汉　430072)

延迟选择影响因素的研究，主要集中于决　　绪，少有对决策场

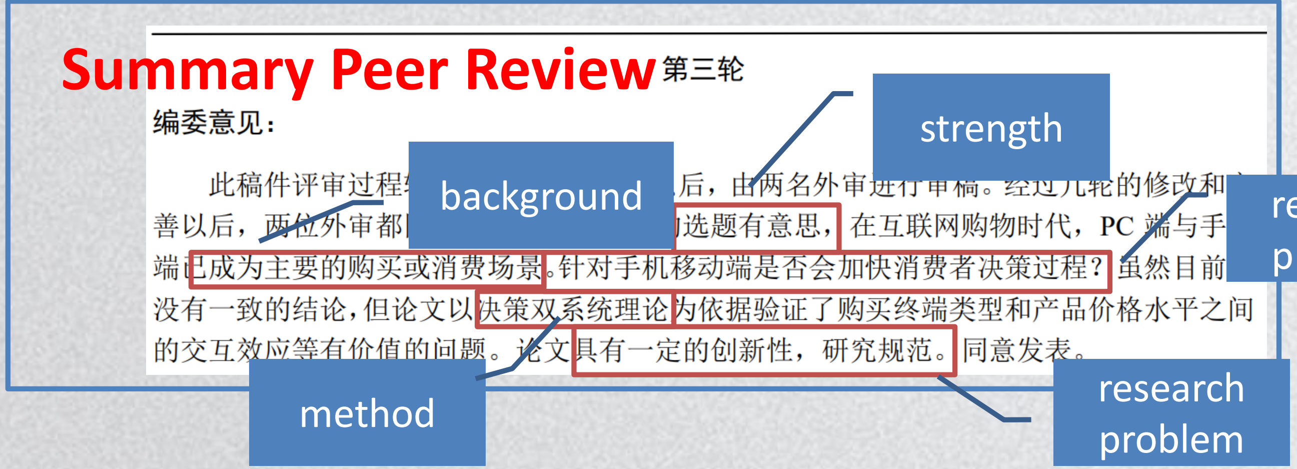
物时代，PC 端与手机端已成为重要的消费　　加快消费者决策过

程的问题目前也存在不一致的结论。本文引入决策双系统理论，力图解释以往看似冲突的结论。消费者的购买决策模式，不仅会受到决策任务(产品价格)的影响，还会受到决策场景(购买终端)影响。当场景与决策任务使消费者启动的思维模式相一致时，会提升决策流畅度，降低延迟选择。本文发现，移动端(PC 端)与低(高)价格产品更容易激发相容的经验性(理性)思维，降低延迟选择倾向。反之，则会同时启动两种相左的决策思维，增加延迟选择倾向。本文从场景启动与价格启动视角，将以往消费者单一的决策思维模式，拓展到多因素启动的思维模式相容性问题；同时本文通过探究延迟选择问题，对价格策略与场景化营销带来启示。

关键词　延迟选择；双系统理论；理性思维；经验性思维；

分类号　B849: F713.55

Summary Peer Review



第三轮

编委意见：

此稿件评审过程　　后，由两名外审　　的修改和

善以后，两位外审都　　选题有意思，在互联网购物时代，PC 端与手

端已成为主要的购买或消费场景。针对手机移动端是否会加快消费者决策过程？虽然目前没有一致的结论，但论文以决策双系统理论为依据验证了购买终端类型和产品价格水平之间的交互效应等有价值的问题。论文具有一定的创新性，研究规范。同意发表。

strength
background
research problem
method
research problem

➢ Abstracts:

- contain function components
- curse of knowledge

➢ Summary Peer Reviews:

- have similar structure to abstracts
- a paper have no less than one review
- reviewers' comments provide a reference for readers to select right papers.

Related Work

- **Well-established norms** in scientific paper writing.
  - Introduction-Method-Results-Discussion (IMRD)[1]
  - Problem-Method-Results-Conclusion[2]
  - Goals-Method-Results[3]
  - Introduction-Method-Results-Conclusions[4]

- **Ontologies** have been put forward.
  - **Function Unit Ontology(FUO)** [5]

[1]Graetz, N. 1985. Teaching EFL students to extract structural information from abstracts. In J. M. Ulijn & A. K. Pugh (Eds.), Reading for professional purposes. Methods and materials in teaching language (pp. 123–135). Amersfoot: Leuven.
[2]Swales, J. 1981. Aspects of article introductions. Birmingham: The University of Aston.
[3]Swales, J. 1990. Genre analysis. English in academic and research settings. Cambridge: Cambridge University Press.
[4]Trawinski, Bogdan. A methodology for writing problem-structured abstracts[J]. Information Processing and Management, 25(6):693–702. 1989.
[5]Zhang L，Kopak R，Freund L，et al. 2010. A taxonomy of functional units for information use of scholarly journal article[J]. In Proceedings of the American Society for Information Science and Technology, 47(1): 1-10.

Related Work

Peer reviews

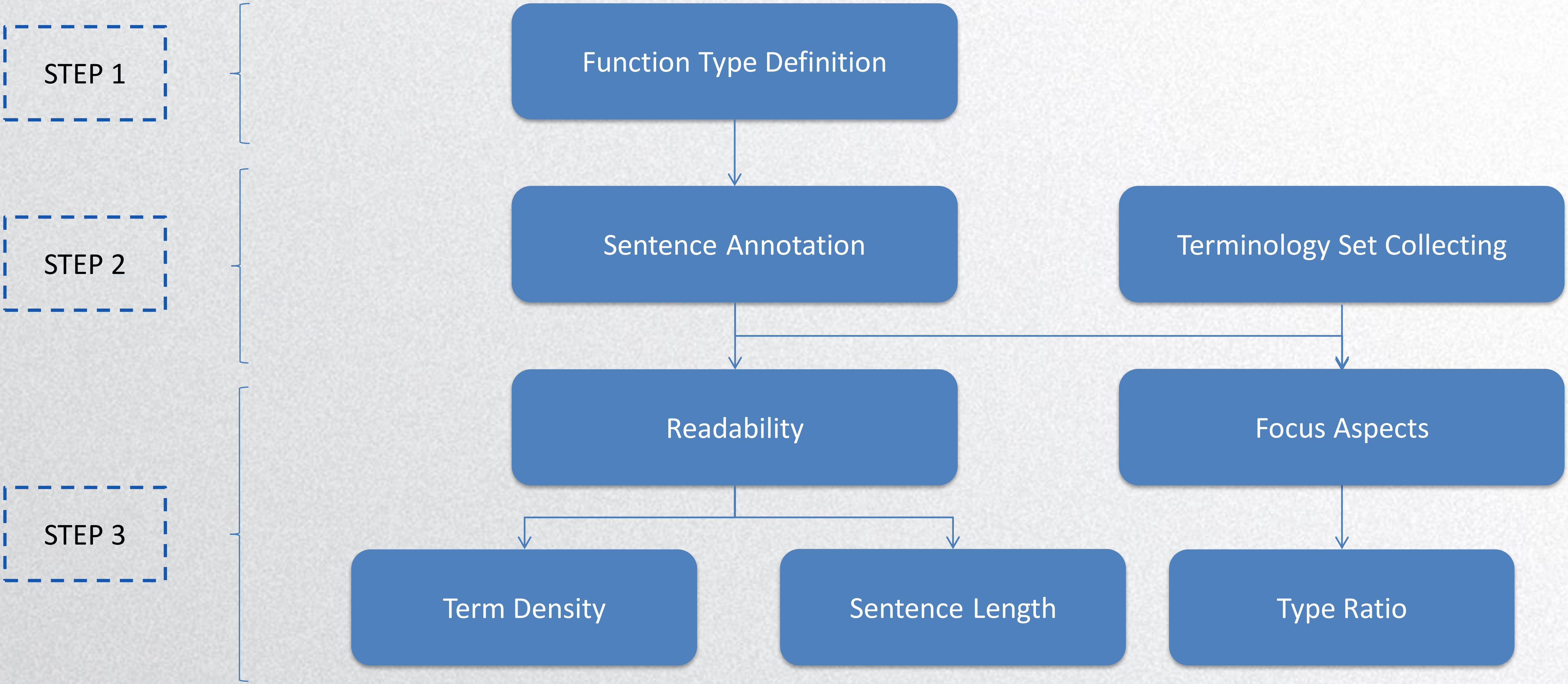
- opinions of a paper
- PeerRead[1]: the first open dataset of review comments for academic research.
- Predict papers' acceptance according to the sentimental of review texts.
  - sentimental of review texts[2]
  - sentimental polarity of the reviews[3]

[1] Philippe Vincent-lamarre, Vincent Lariviere. (2019). Content and linguistic biases in the peer review process of artificial intelligence conferences. arXiv: https://arxiv.org/abs/1911.02648
[2] Ke Wang and Xiaojun Wan. (2018). Sentiment Analysis of Peer Review Texts for Scholarly Papers. In The 41st International ACM SIGIR Conference on Research & Development in Information Retrieval (SIGIR '18). ACM, New York, NY, USA, 175-184. DOI: https://doi.org/10.1145/3209978.3210056
[3] Gupta S, Manning C D. Analyzing the Dynamics of Research by Extracting Key Aspects of Scientific Papers[C]. international joint conference on natural language processing, 2011: 1-9.

Related Work

- What will be discusses is the two questions:
  - the difference on **functional components and readability** of abstracts and summary peer reviews;
  - **the focus aspects** highlighted by summary peer reviews.

Research Process



STEP 1

Function Type Definition

STEP 2

Sentence Annotation

Terminology Set Collecting

STEP 3

Readability

Focus Aspects

Term Density

Sentence Length

Type Ratio

Research Process

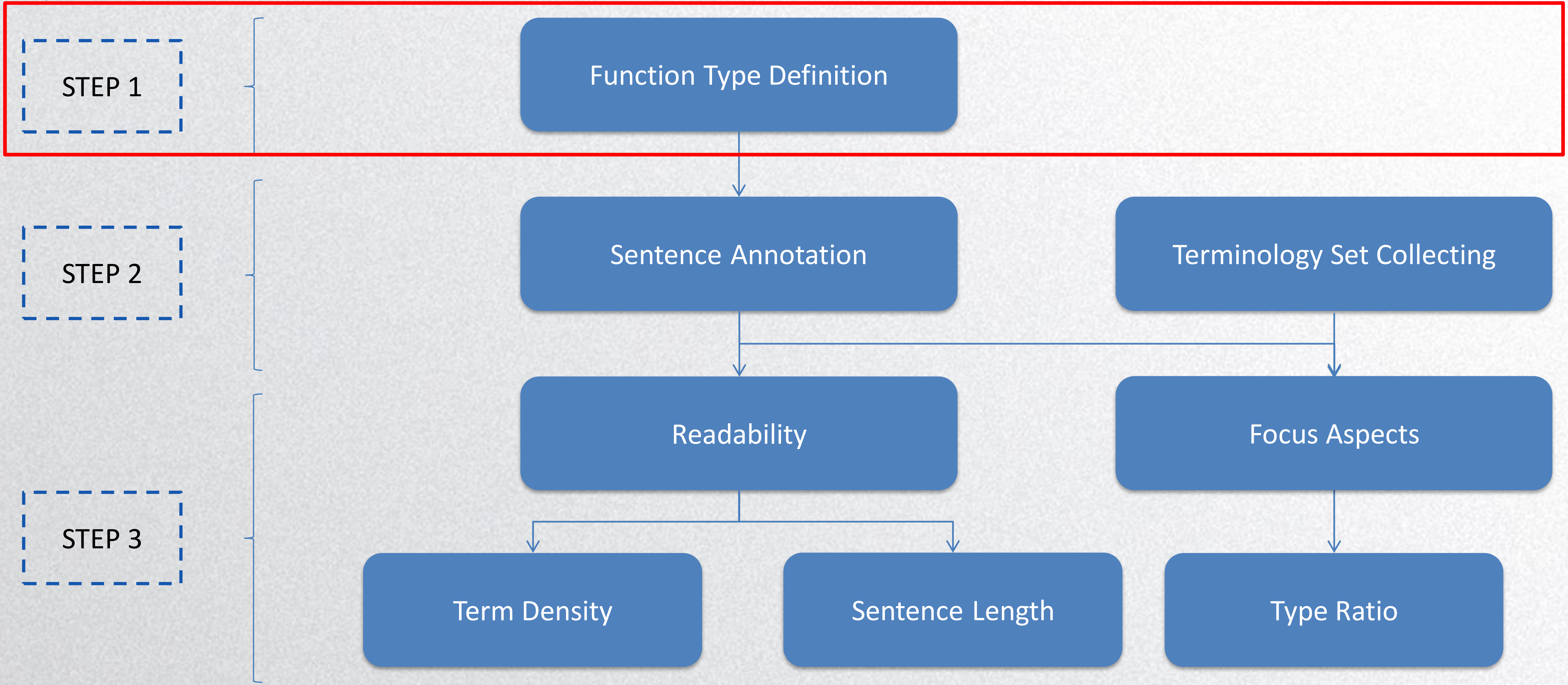


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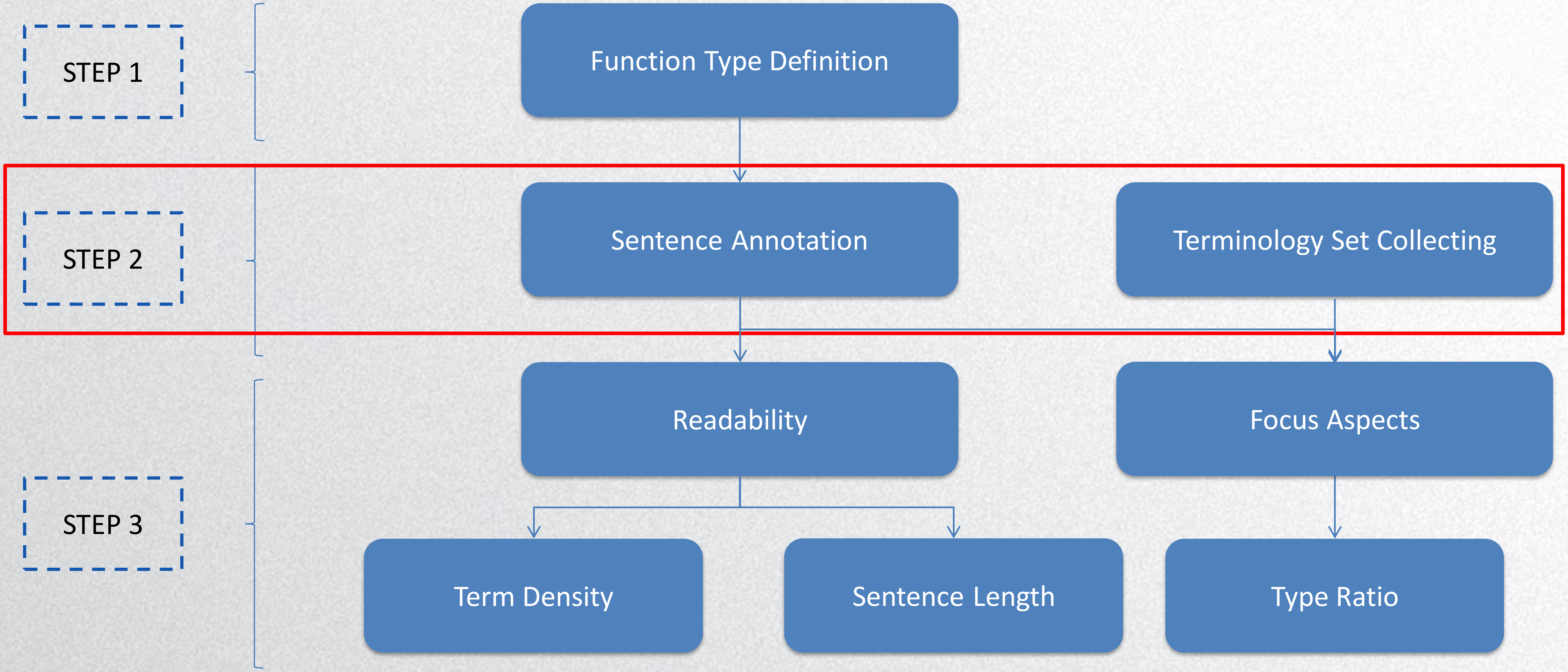
Table 1. The Definition of Function Types

Function Type	Meaning	Pattern examples
Background	Background of theories and applications; existing studies; unsettled gaps; necessity and significance of the current study;	in order to (solve the problem) …; …remain unsolved; …not (completely) studied yet;
Theme	Research scope; research goal; definition to the concerned problem;	(this study/article/paper) propose/investigate/discuss/demonstrate … ;
Process	Hypothesis; methods; experiments; theories and research perspectives;	Base on…proposed; First…Secondly…Last;(model/approach/method) be used/implemented…;
Result	Description and evaluation on the result , Hypothesis and methods;	(experiment/result/simulation/) show/demonstrate…;…(provide/give) a reference to …;
Contribution	Contribution to the related theories or methods; Comparison with previous studies; insight obtained; future work;	The contribution (of this study/paper)…; (This study) improve…;The improvement (of this study/research) is…;
Strength	Claim the strength or highlights of the whole study and the current paper with summary description.	(idea/ concerned problem) new/novel/critical…; (experiment/data processing/research design) is firm/well;… is significant to sth;

Research Process



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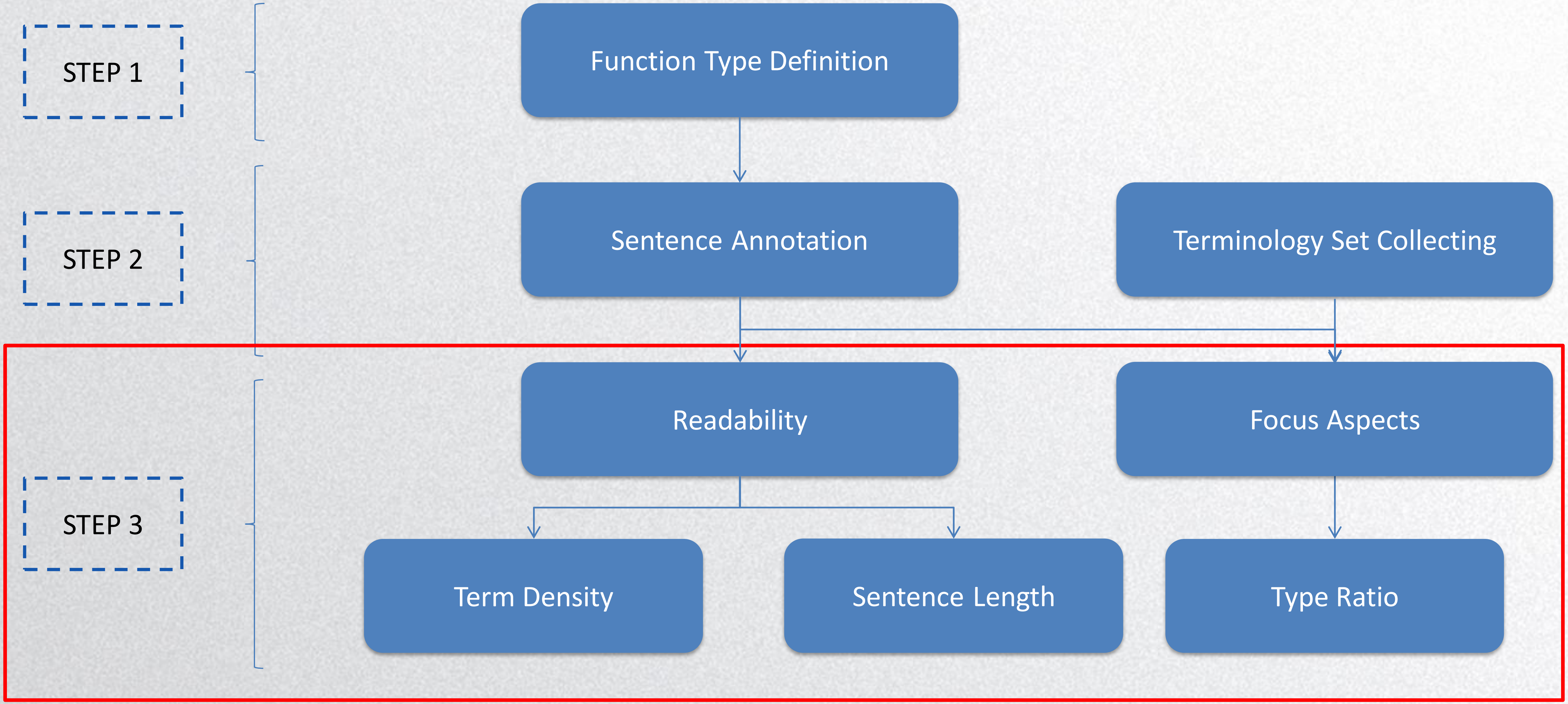

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Research Process

- **Term density** reflects the average number of general terms or terminology appeared in sentences
- **Sentence length** is the average number of character in the sentences of a function type.
- **Type proportion** shows the focused function of reviews and abstracts by the proportion of sentences of each function type.

Experiment

Dataset

（1） R & A

- 774 papers (2014-2019, *JAPS*)
- A: 4397 sentences in abstracts
- R: 2777 sentences in peer reviews

Table 2. Sentences of Different Types in Summary Peer Reviews and Abstracts

Function types T	# sentences n		avgLen		T %	
	R	A	R	A	R	A
Background	124	532	39	44	4.5%	12.1%
Theme	638	504	30	37	23.0%	11.5%
Process	519	1011	30	49	18.7%	23.0%
Result	354	1724	47	68	12.7%	39.2%
Contribution	347	575	35	61	12.5%	13.1%
Strength	795	44	23	34	28.6%	1.0%

Experiment

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Experiment

Dataset

（2） Terminology set

- Collected from three sources
  - keywords
  - Academic Hotspots of Psychology[1]
  - Chinese Terms in Psychology[2]
- 8,354 terms in total.

Table 3. Term Density of Summary Peer Reviews and Abstracts

Function types T	General terms		Terminology	
	R	A	R	A
Background	10.4	12.1	4.4	4.9
Theme	9.0	10.3	4.6	5.0
Process	9.1	14.3	3.4	5.4
Result	13.8	19.3	5.5	7.5
Contribution	9.7	17.3	4.1	7.0
Strength	6.4	10.7	2.1	4.8

[1]Academic hotspots of psychology in CNKI China Academic Journal Network Publishing Database
[2]http://shuyu.cnki.net/

Conclusion

- Peer reviews is another type of text to extract paper information.
- **Similar function types but different focus**
  - 6 types of function components in summary peer reviews and abstracts have been defined.
  - Summary peer reviews specially highlighted the strength of a study or a paper.
- **High readability**
  - Lower term density reduce the difficulty of reading.

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学为人师
行为世范

THANKS & QUESTIONS!