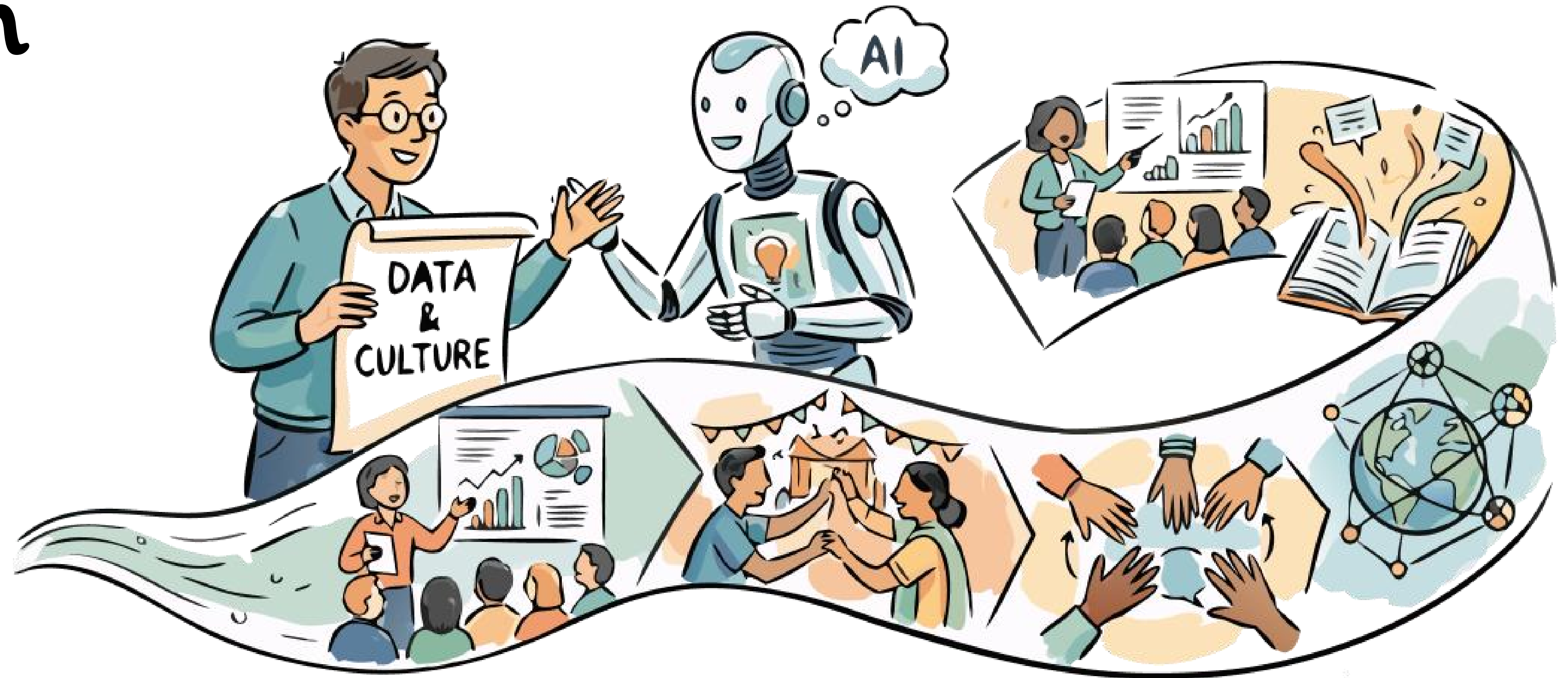
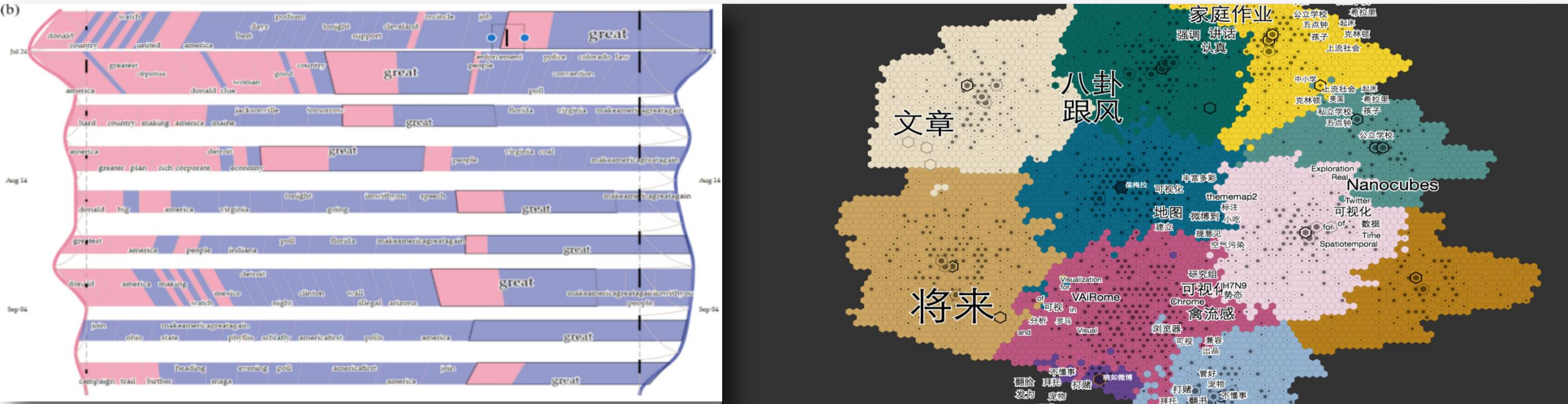


Beyond “Translation”: Communicating Data Stories and Culture through Human-AI Collaboration



Self-Introduction – Siming Chen



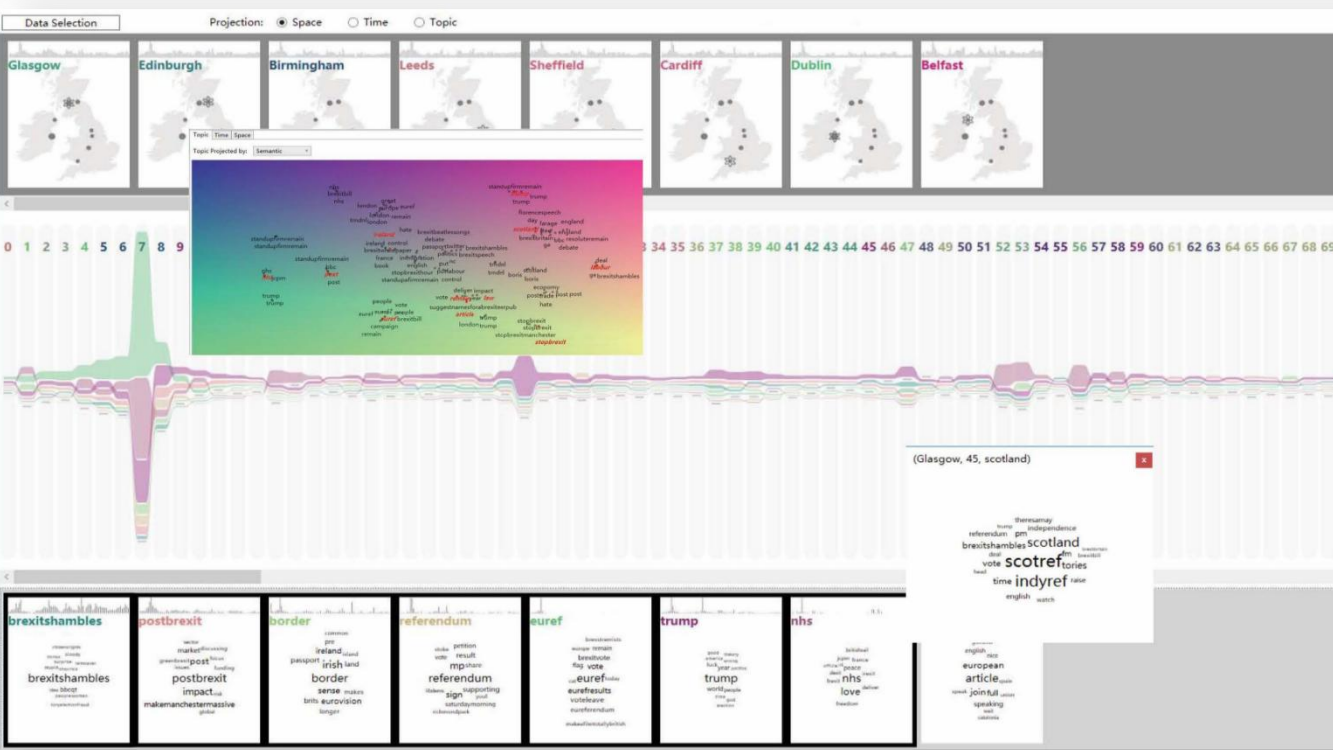
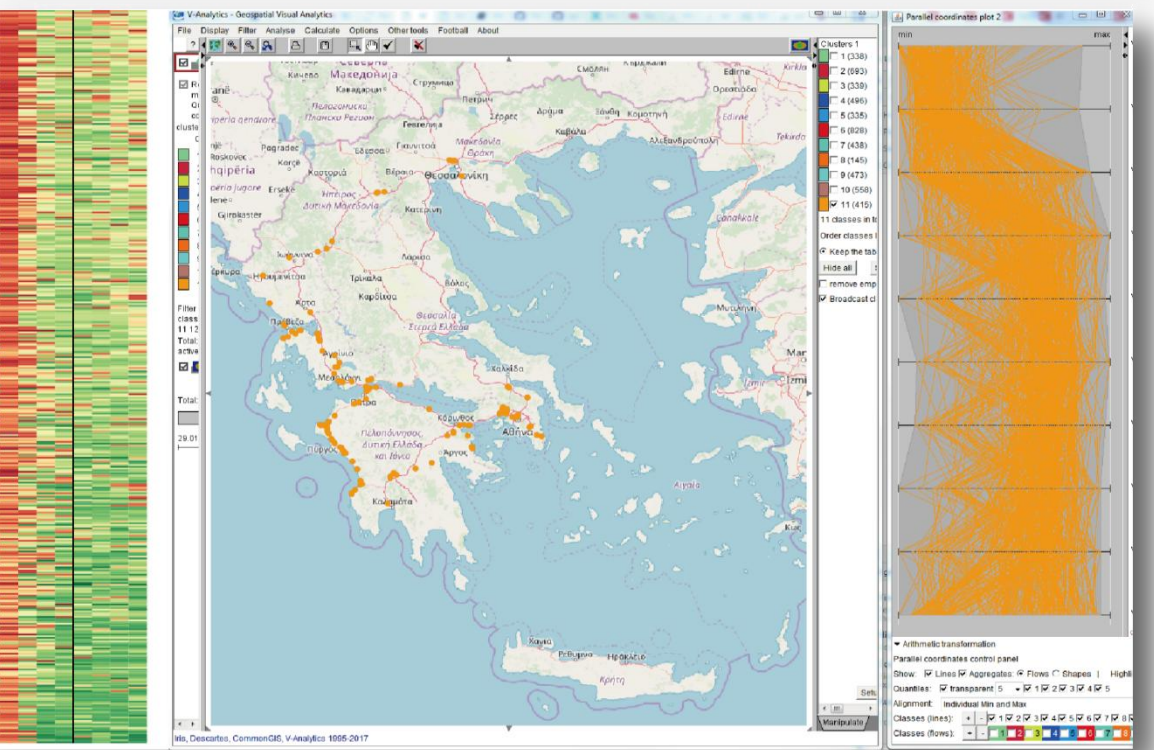
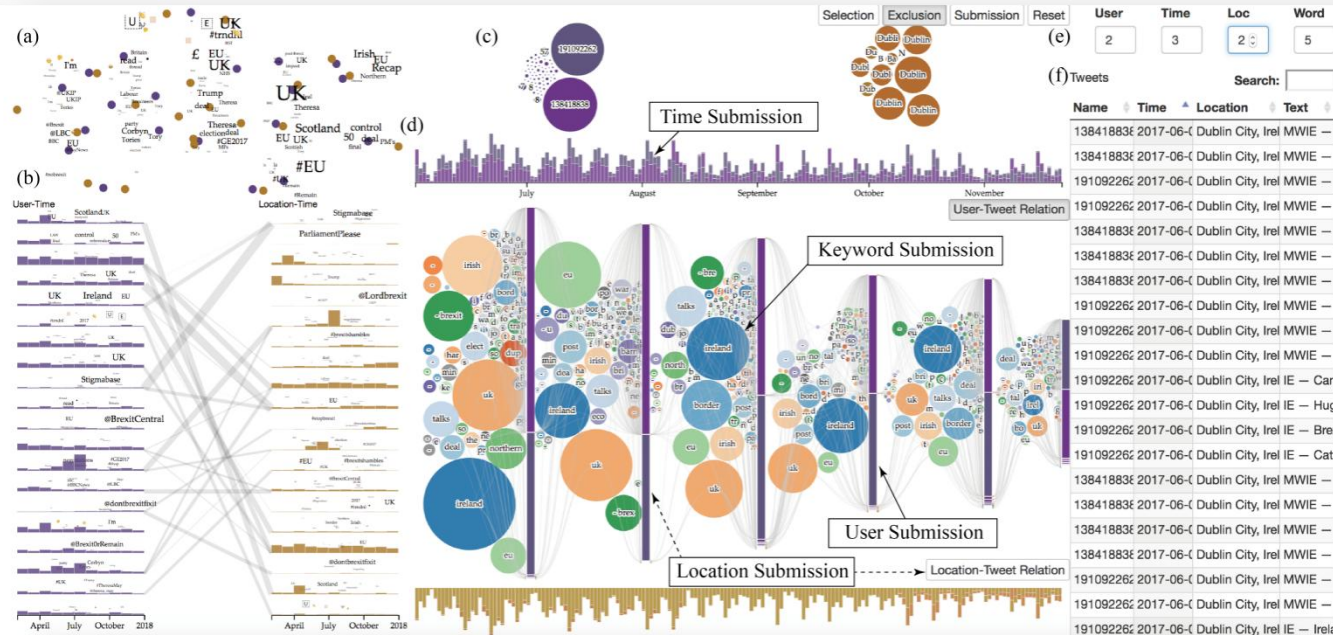
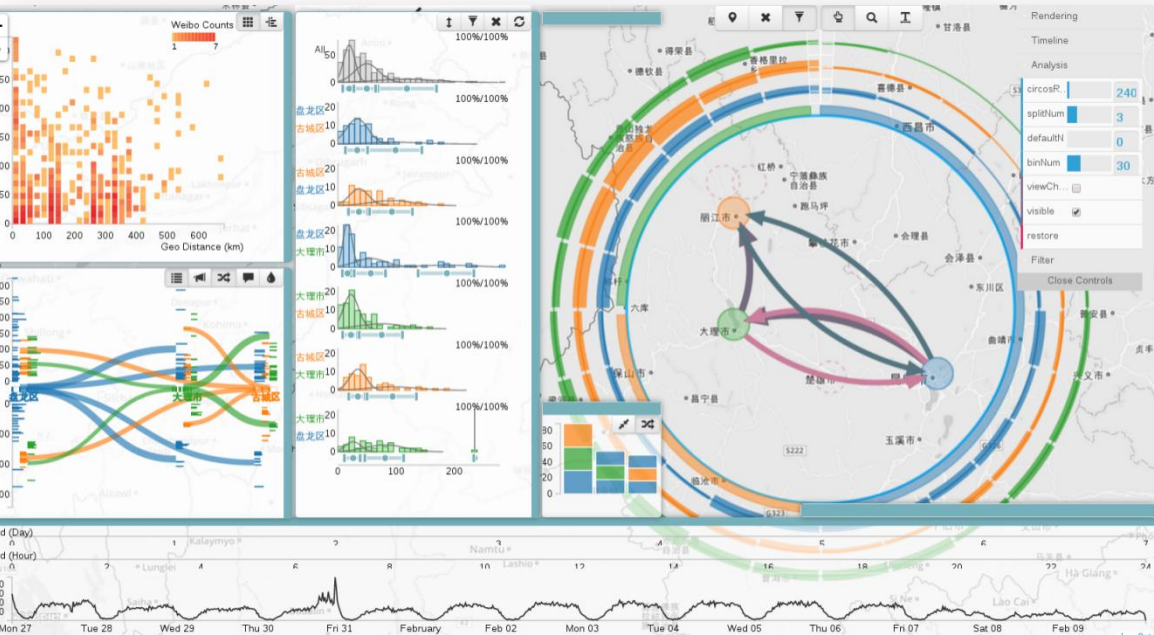
2007 - 2011: Fudan University, Bachelor

2011 - 2017: Peking University, Ph.D.

2017 - 2020: University of Bonn, Postdoc

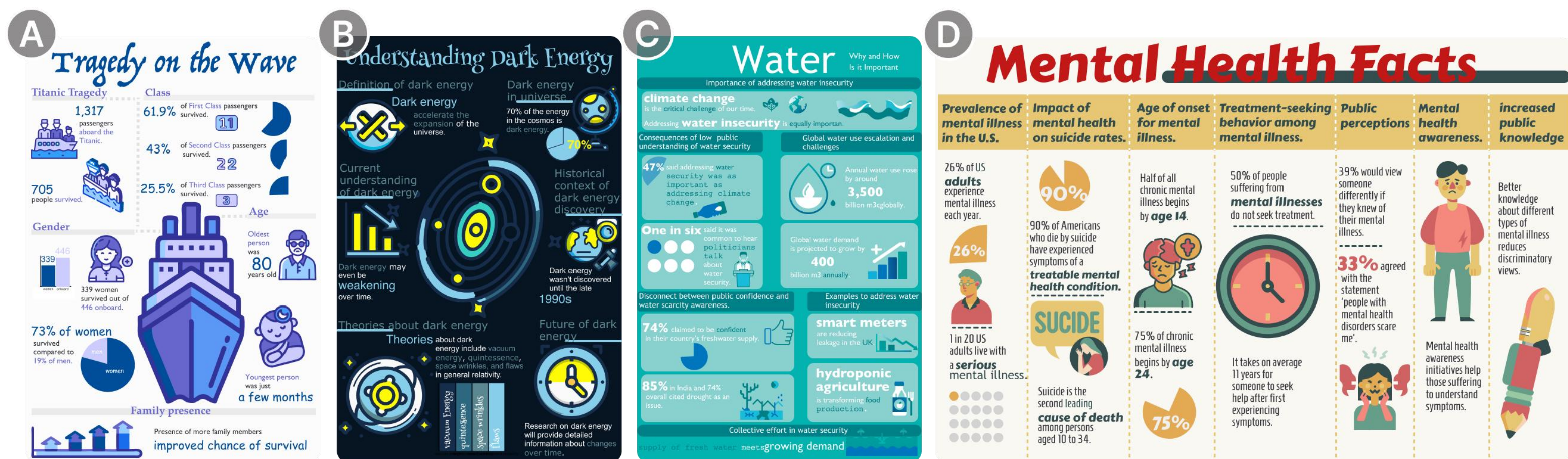
2017 - 2020: Fraunhofer IAIS, Research Scientist

2020 - Now: Fudan University, Associate Professor



Published 100+ paper, including **50+ in top venues and journals**, including IEEE TVCG, ACM CHI, UIST, CSCW, EuroVis, CGF, etc. **AI 2000 Most Influential Scholar Award Honorable Mention (Global 100)**, in the field of **Visualaziation** between 2012-2022. Won 11 best paper or honorable mentions from academics. Served as **Paper Chair** in IEEE PacificVis, Fastforward Chair in IEEE VIS, Data Challenge Chair in ChinaVis. Served as **Associate Editors** in IEEE CG&A, Visual Informatics

CHI'26



InfoAlign: A Human-AI Co-Creation System for Storytelling with

Infographic



Jielin Feng¹



Xinwu Ye^{1, 2}



Qianhui Li¹



Verena Prantl³



Jun-Hsiang Yao¹



Yuheng Zhao¹



Yun Wang⁴



Siming Chen¹



¹Fudan University


²The University of Hong Kong

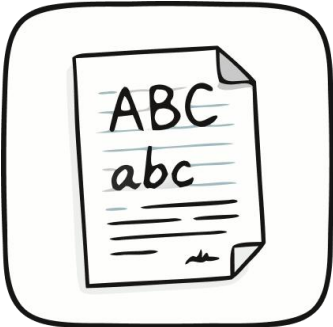
³University of Vienna


⁴Microsoft Research Asia



Background

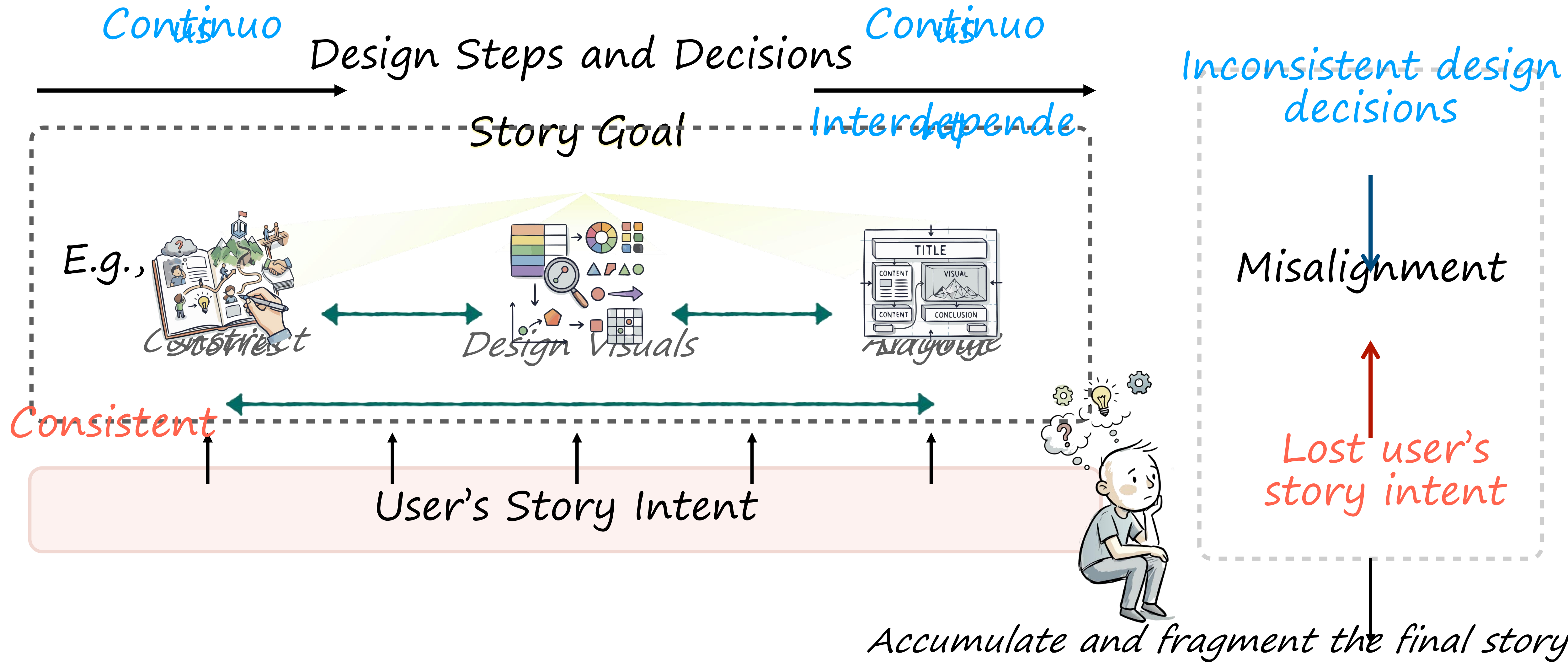
Data 

Text 

Visual Design 



Challenges

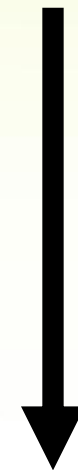


Research Goal

Commercial
 Drivaphate -
 Highlgnated
 Limited User



Researches
 Isolated Tasks
 Single Design
 Support Cross-stage



Infographic generation system that enables the creation of
 infographics *presenting consistent stories aligned with the user's story
 intent*

RQ1: What design steps are necessary for an infographic to convey a story?

Formative Interview

What design steps are necessary for an infographic to convey a story?

8

Infographic
Creators

Understanding of Infographic:

Conceptualizing infographic design as a storytelling process

Input requirement:

Long & Unstructured text + User Query

7

Questions

Design requirements:

Constructing stories visual designs aligned with story and user

Layout that guide story reading flow

Collaboration requirement:

Human-AI Collaboration with flexible control



Layout Design-Space



Data Preparation & Coding Process

268 Infographic examples collected

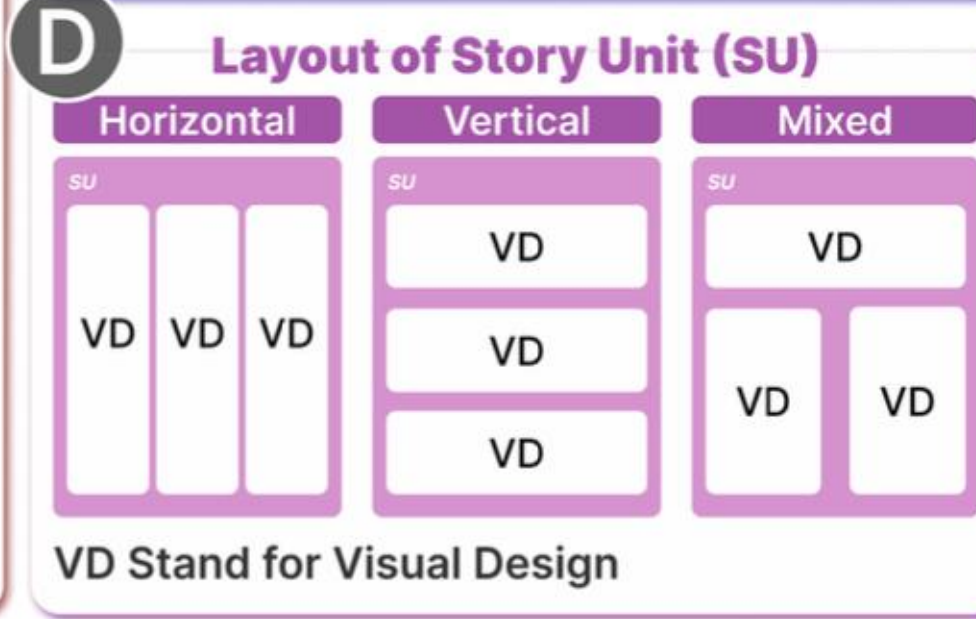
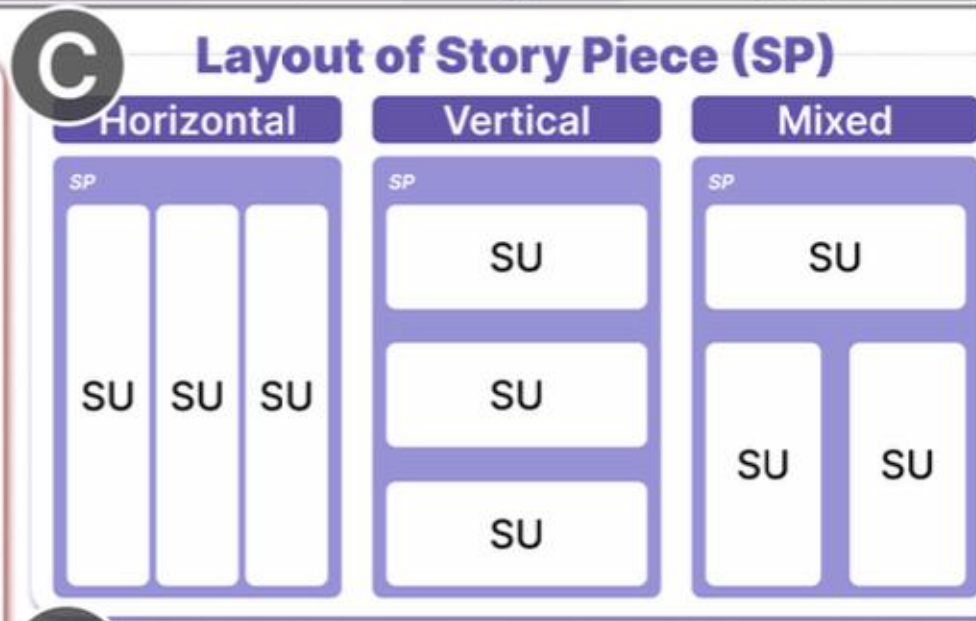
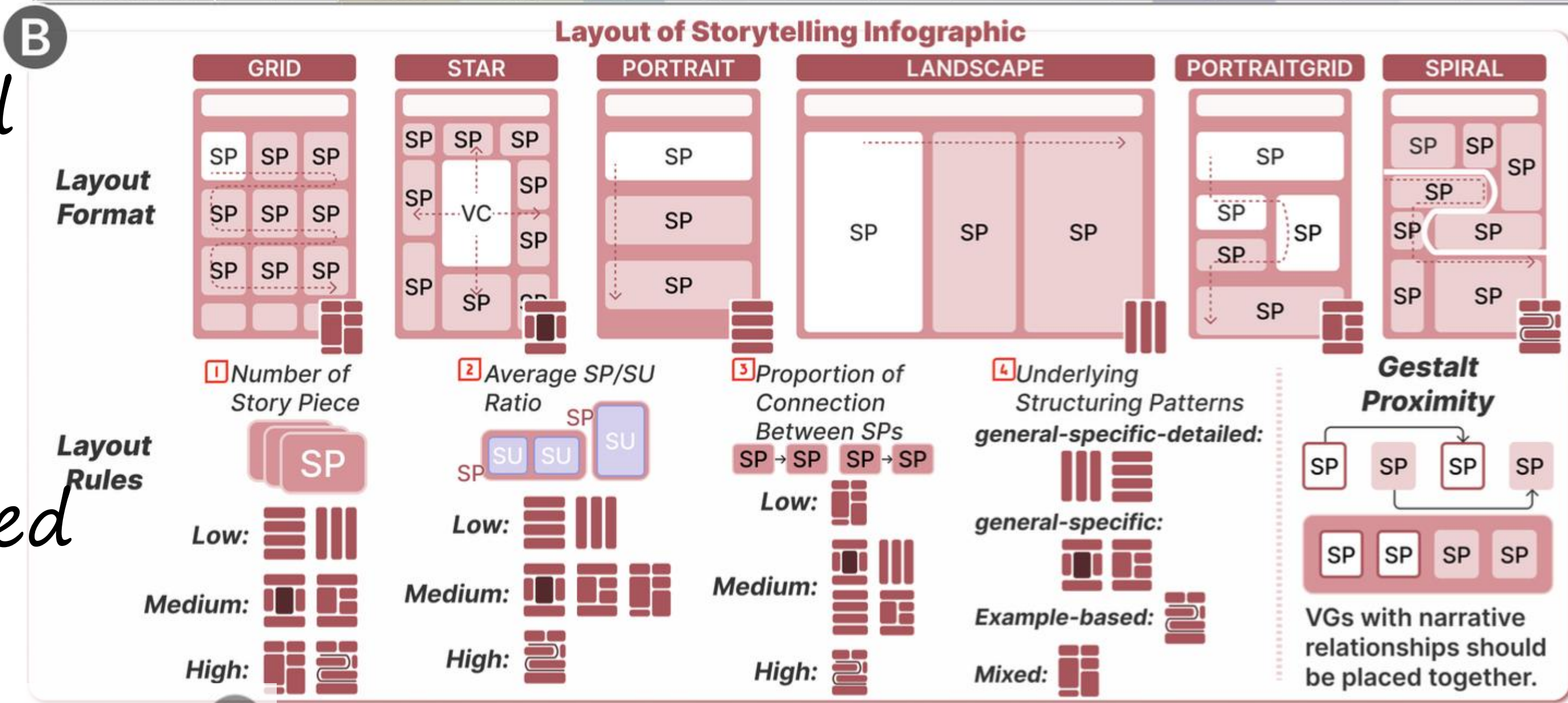
6 Criteria

70 Storytelling infographics filtered

Story Piece

A

Layout	Count	Average SP	Average SU	SP vs SU							Narrative Logic between SP and Story Goal						Narrative Logic Between SPs
				1 vs 1	1 vs 2	1 vs 3	1 vs 4	1 vs 5	1 vs 6	1 vs 7	Elaboration	Example	Attribution	Generalization	Temporal	Cause-Effect	
Grid	15	9.13	12.6	102	25	5	4	0	1	0	76	16	3	6	2	2	28%
Spiral	14	9.14	10.5	113	11	4	0	0	0	0	4	90	4	8	20	3	72%
Portrait	15	3.13	8.42	9	17	9	7	3	1	1	20	14	0	12	1	0	52%
Star	14	7.64	11.9	72	22	7	3	1	1	0	77	3	2	12	1	0	59%
PortraitGrid	12	6.83	9.75	63	11	3	3	1	1	0	57	14	1	10	4	13	55%

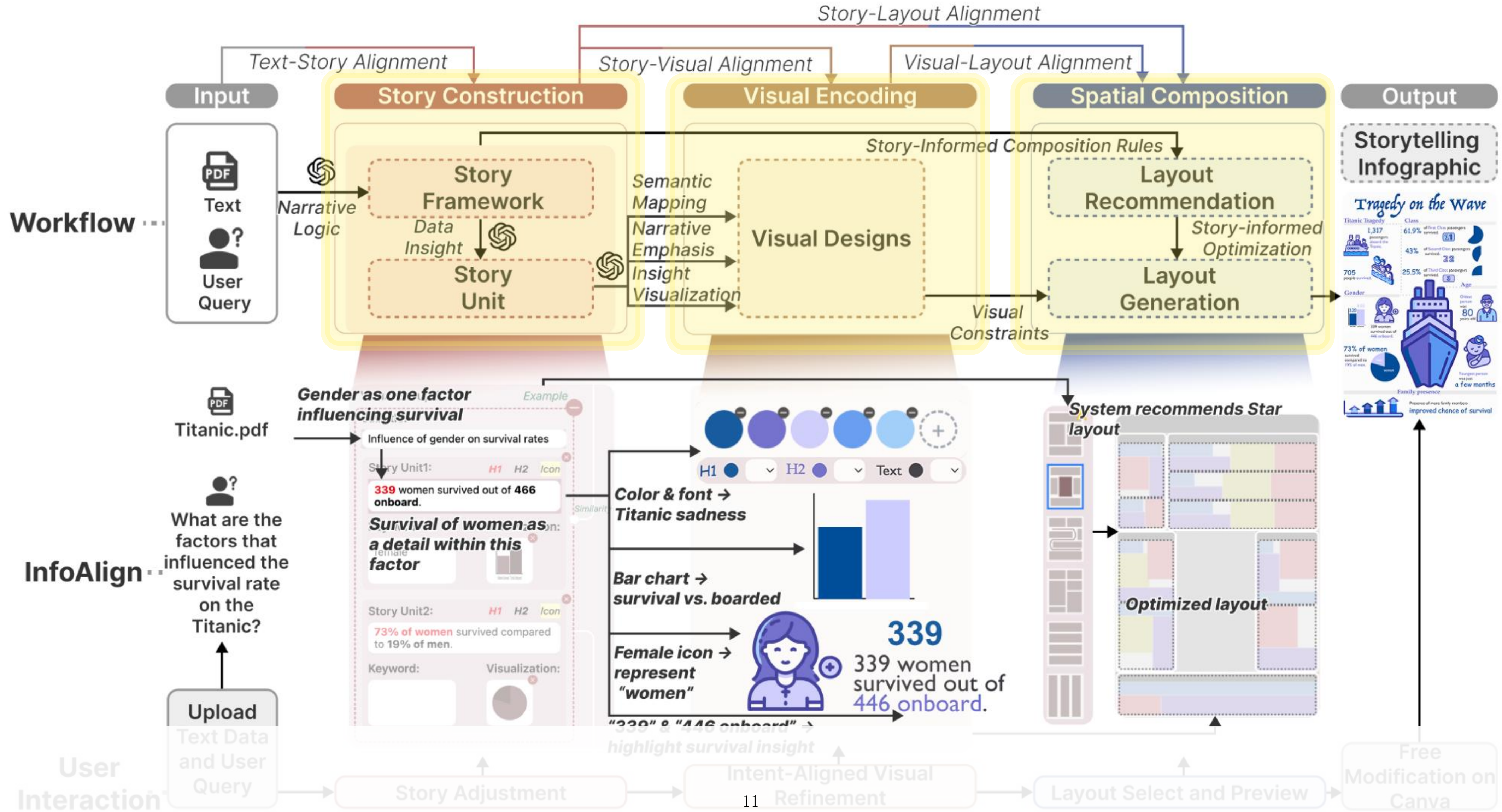


- Story Piece Count
- Story Unit Density
- Narrative Connection
- Story Structure
- Gestalt Proximity

How layout support story flow?

RQ2: How can story consistency be maintained across the design steps of an infographic?

Narrative-Centric Workflow



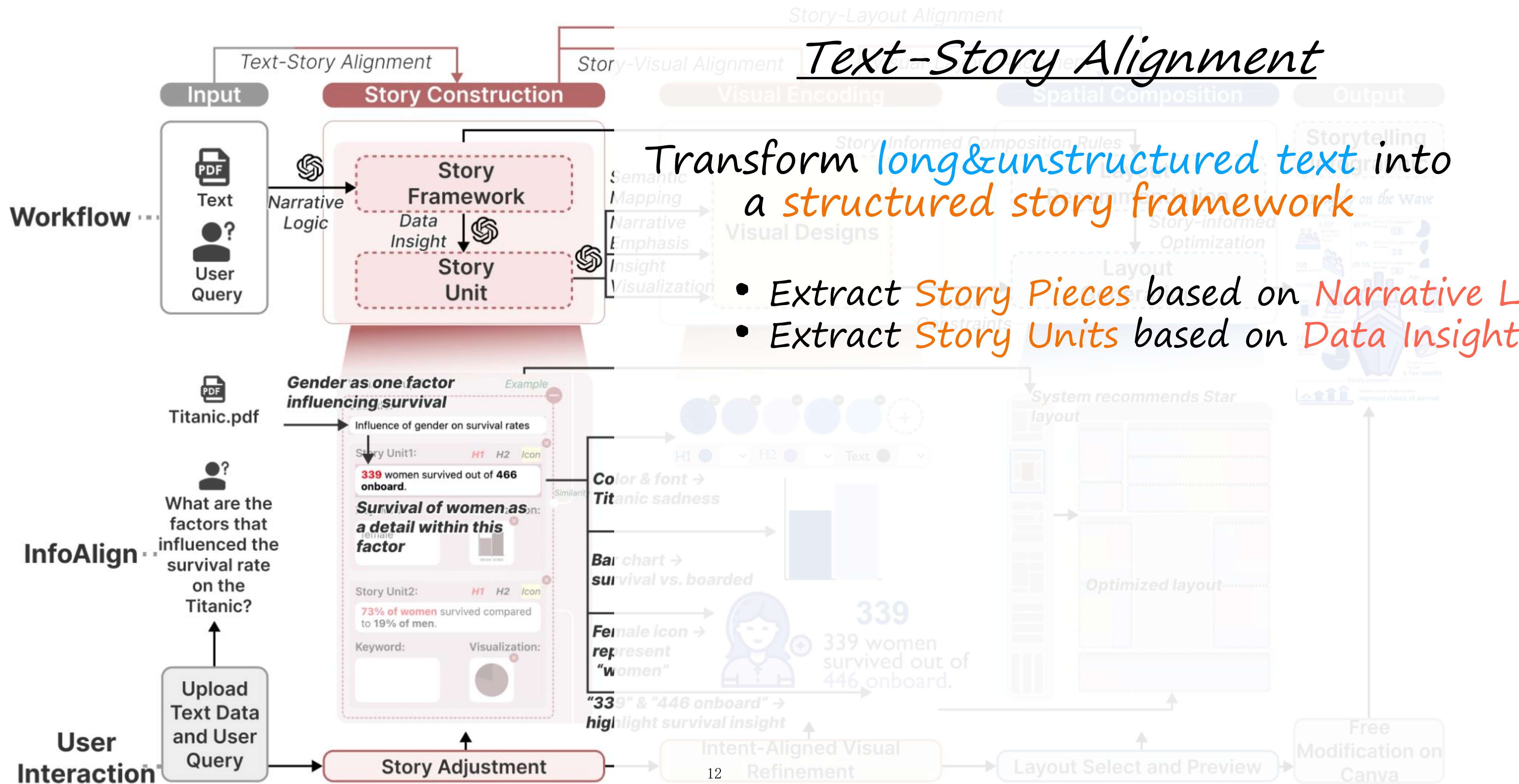
Story Construction



Text-Story Alignment

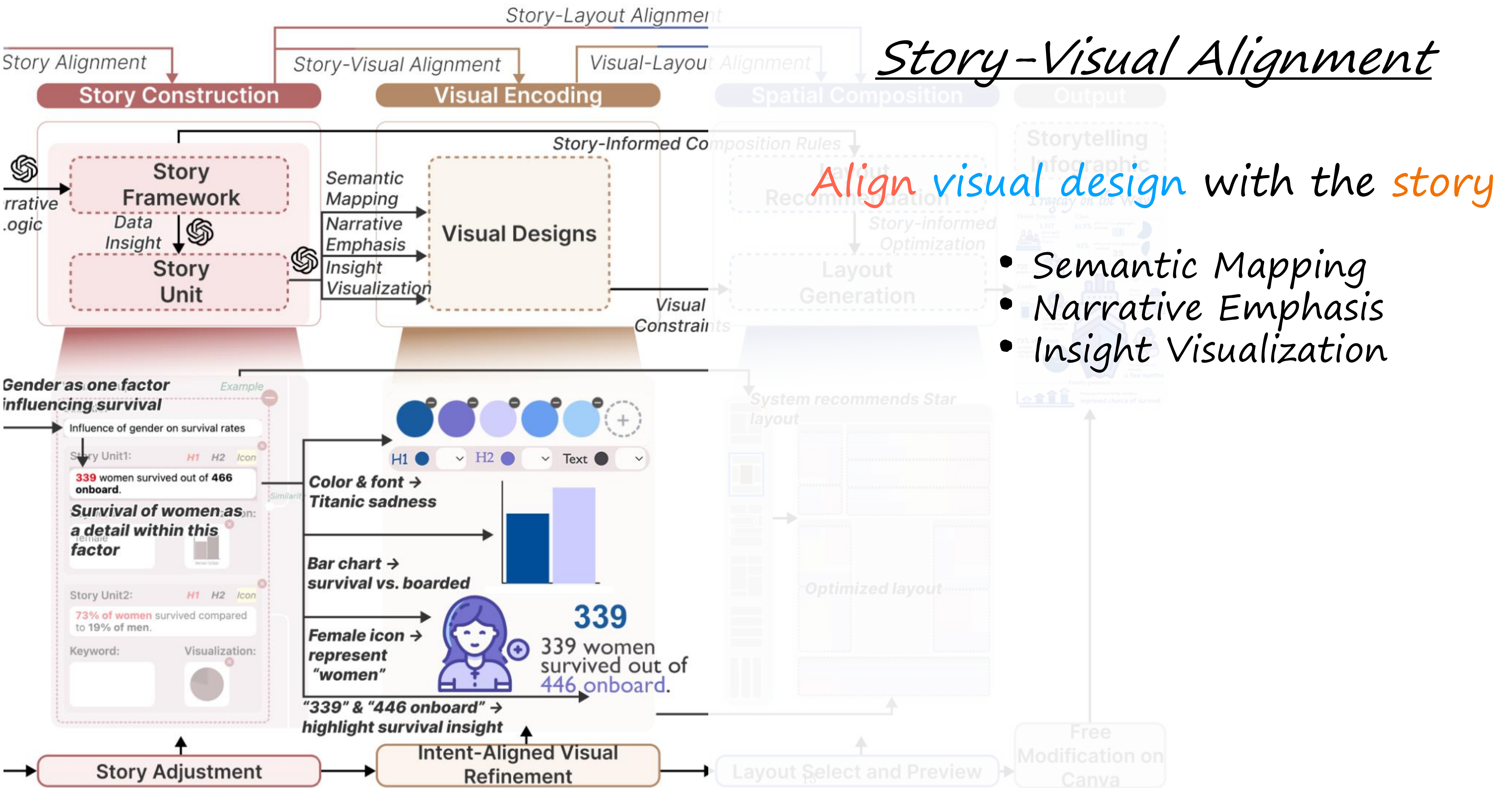
Transform **long & unstructured text** into a **structured story framework**

- Extract **Story Pieces** based on **Narrative Logic**
- Extract **Story Units** based on **Data Insight**

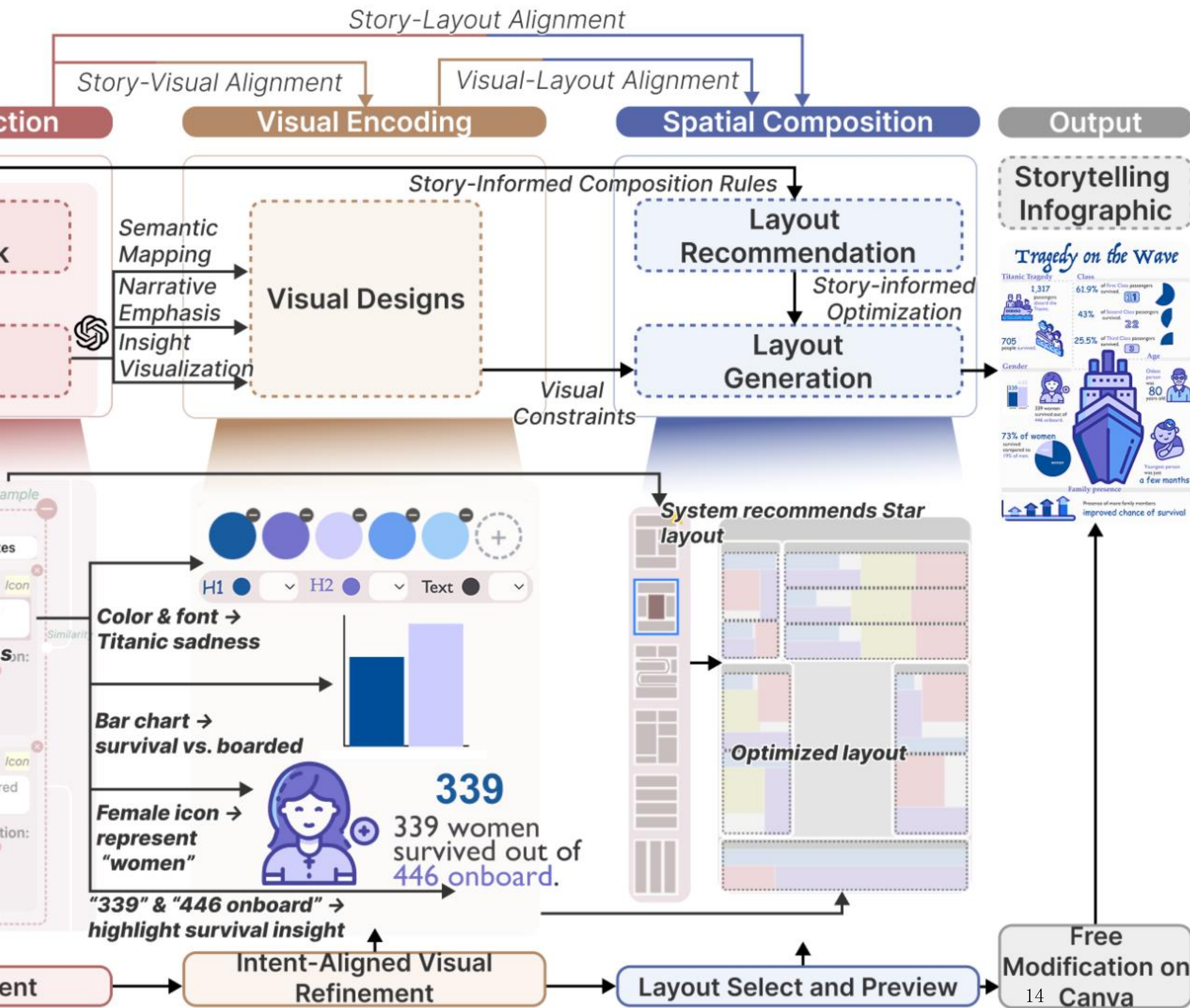


Visual Encoding

Story-Visual Alignment



Spatial Composition



Story-Layout Alignment

Arranging the infographic layout guide the user's story reading

- Story-informed composition
- Visual constraints

RQ3: How can the user's story intent be preserved through out the design steps of an infographic?

Interface



A **Input View**

Stylization View

B Story View

61.9% of First Class passengers survived.

Icon Keyword: Chart:

Story Unit 2: H1 H2 Icon

43% of Second Class passengers survived.

Icon Keyword: Chart:

Icon of 2

Story Unit 3: H1 H2 Icon

25.5% of Third Class passengers survived.

Icon Keyword: Chart:

Icon of 3

Story Piece 3 Example

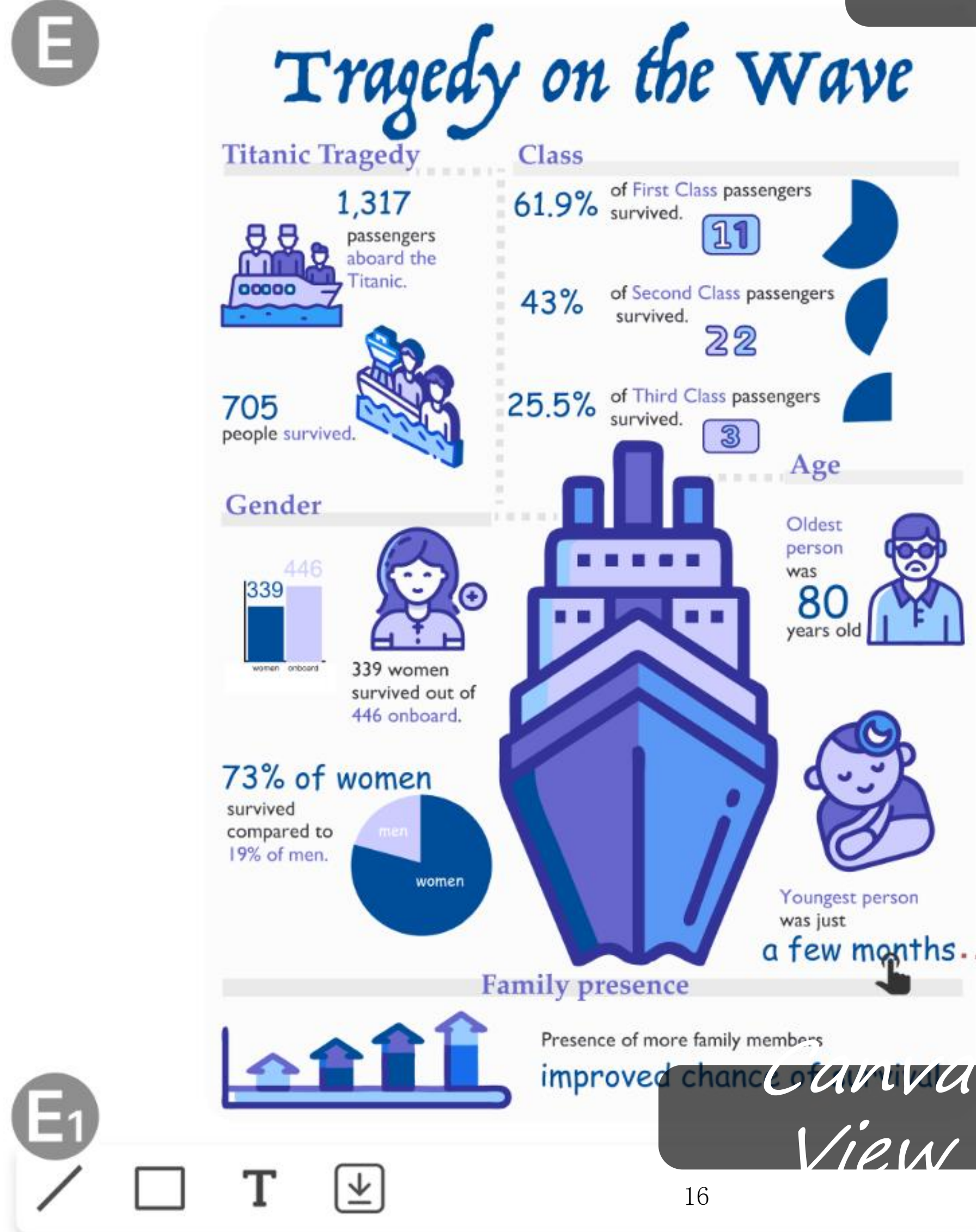
subtitle: Influence of gender on survival rates

Story Unit 1: H1 H2 Icon

339 women survived out of 466 onboard.

Icon Keyword: Chart:

female



C

Color palette:

D Layout View

Grid layout editor with a central preview window and a 'SUBMIT' button.

Story Piece

Subtitle

Story Unit

Story Unit

E2

Edit Text: a few months

Text Font: 20px, Comic Sans MS

Text Color:

Delete

H1

Icon

Chart

Text

E1 Canva View

Editing toolbar with icons for text, image, and download.



1000 x 600 px

NEXT STEP

Color palette: black, dark grey, brown, blue, and a plus icon for more colors.

Aa H1 H2 Text

Grid layout options on the left with a yellow star on the top-left icon.

Large dashed rectangular area for content.

SUBMIT

InfoAlign

Bottom toolbar with icons for: line, square, bold text (T), and download.

Evaluation & Findings

Mix-method, task-based user study

12 experienced infographic designer

Coherent & Consistent stories representation

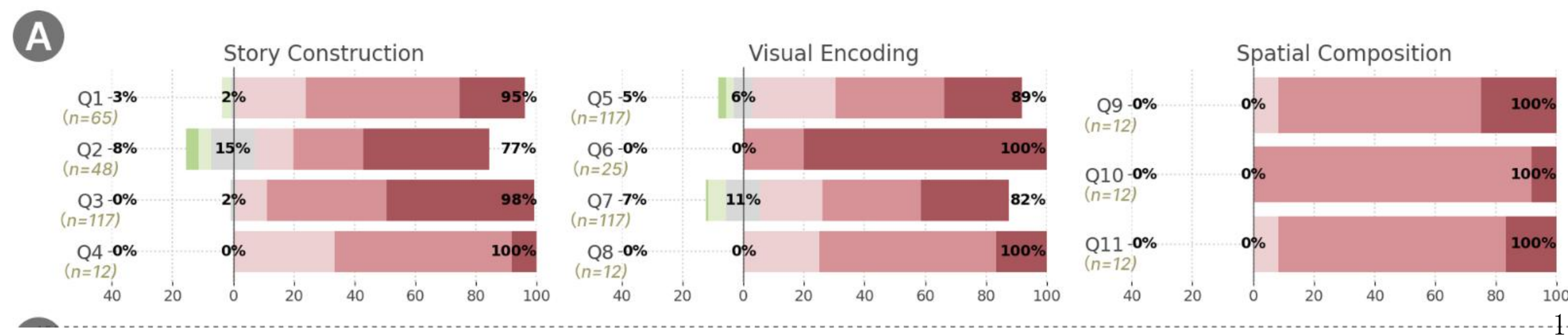
1. Workflow-level quality

Dimension	Questionnaire Items
Story Construction	Q1. The role of this story piece in the overall story is clear and makes sense.
	Q2. The connections between this story piece and its related story pieces are clear.
	Q3. This story unit clearly elaborates the idea of its corresponding story piece.
	Q4. The overall storyframe is in line with my story goal.
Visual Encoding	Q5. The icon keyword for this story unit semantically matches its content.
	Q6. The chart for this story unit appropriately visualizes its data or insight.
	Q7. The highlighted text in this story unit correctly emphasizes the key information.
	Q8. The colors and fonts are consistent with the theme and tone of the story.
Spatial Composition	Q9. The layout presents the story in a clear and logical sequence.
	Q10. The overall narrative flows smoothly from beginning to end.
	Q11. The layout is well-structured.

- Aligning story goals and constructed stories
- 95% story pieces were rated as coherent
- 98% story units were rated as coherent

- Story-aligned visual designs
- 89% icons were rated as semantically appropriate
- 98% highlights were rated as correctly emphasized
- All charts were rated as appropriately reflective

- Story-informed spatial composition
- All layout were perceived as well structured in logical sequence with a smooth reading flow

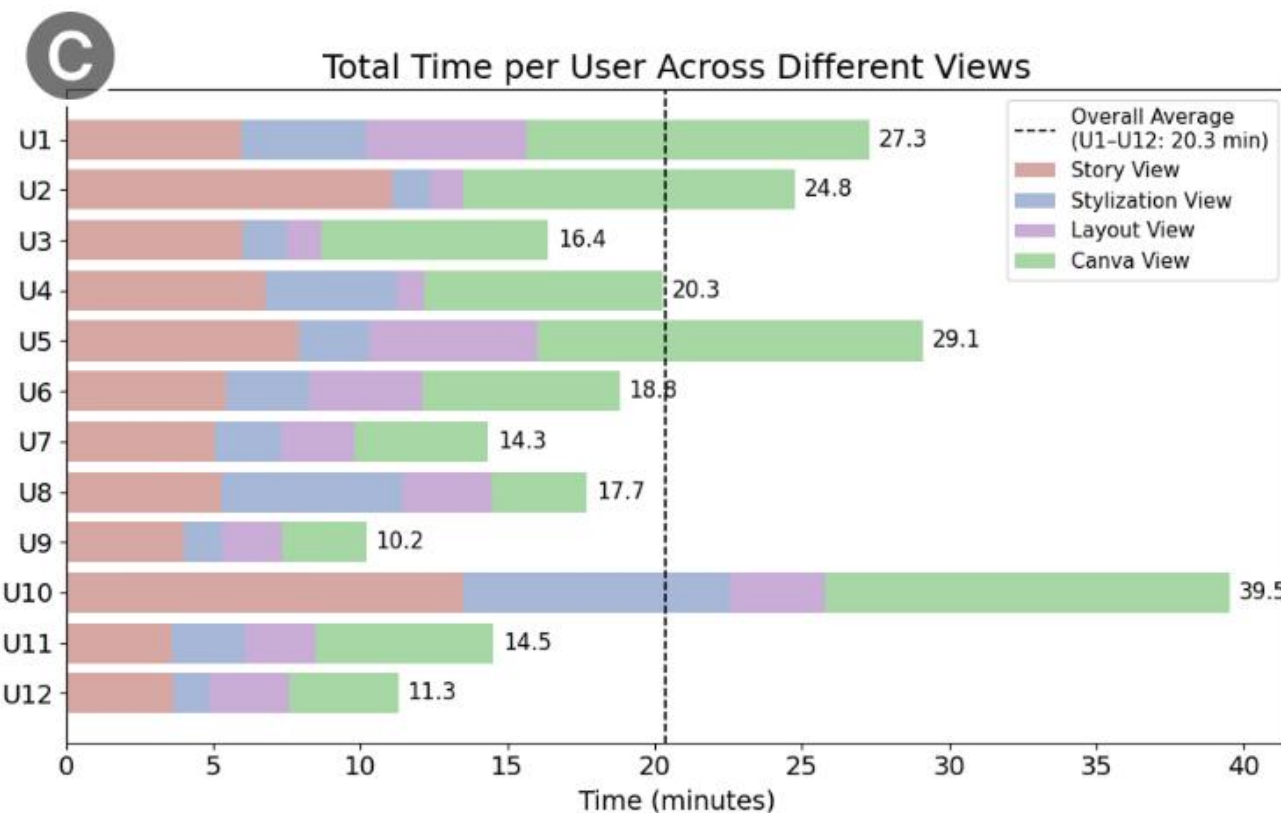
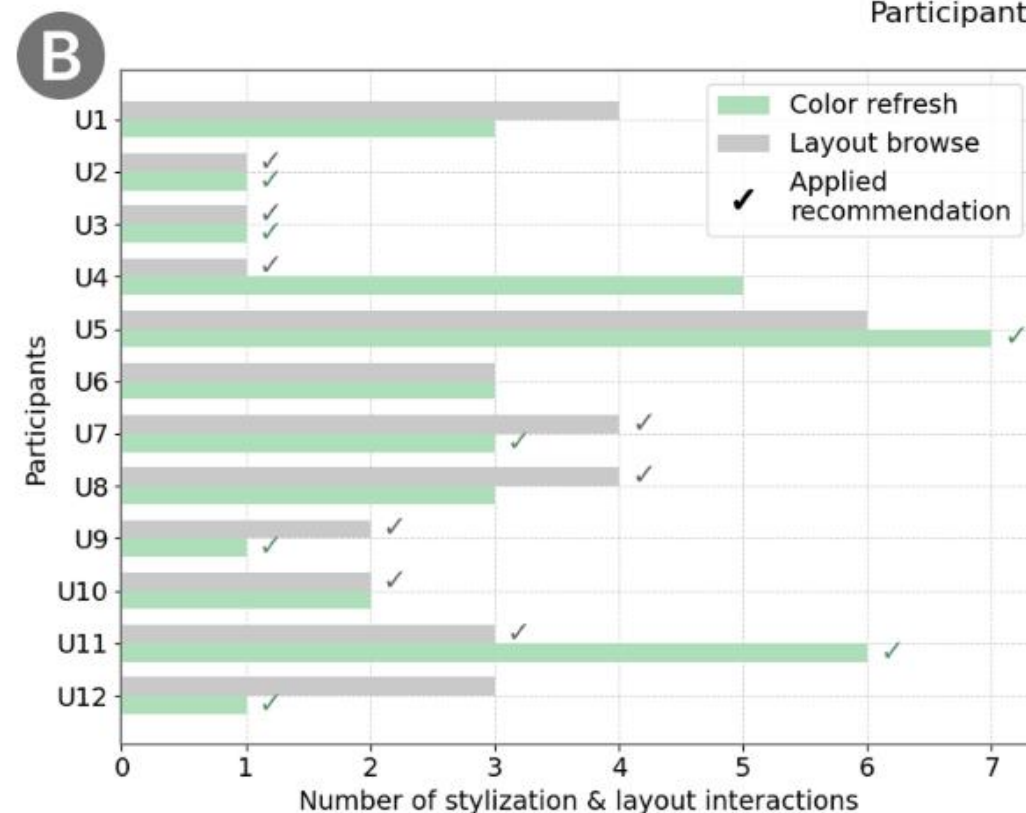
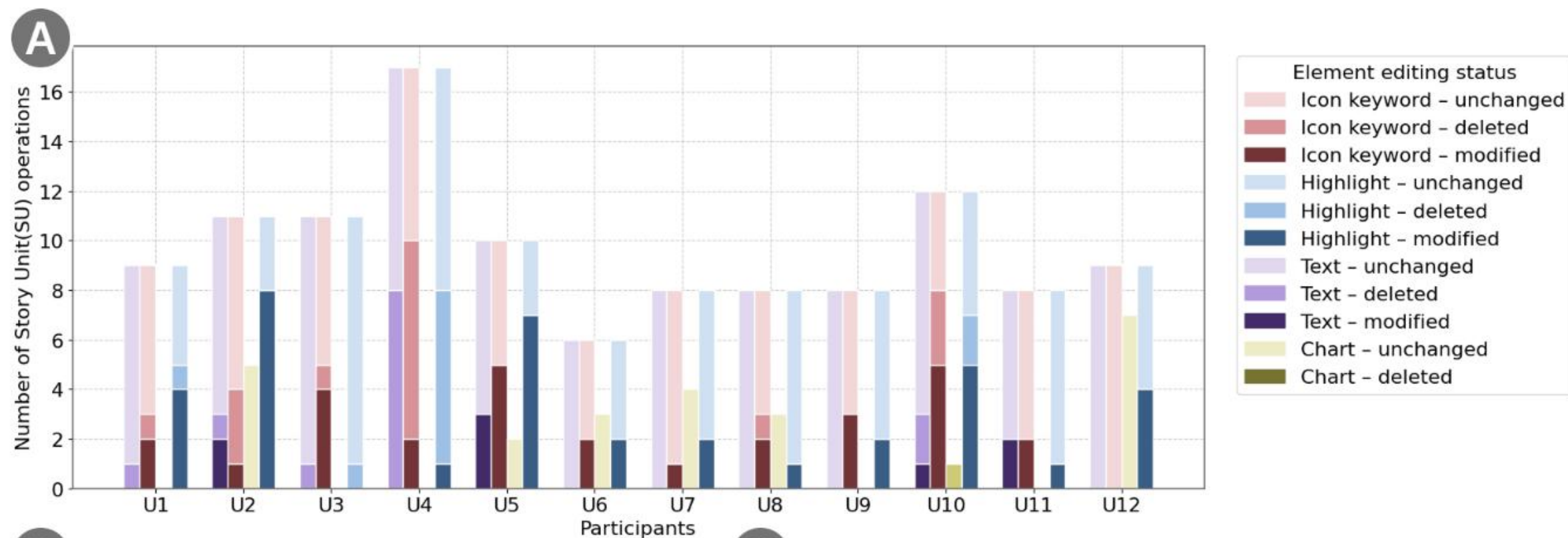


Evaluation & Findings

Mix-method, task-based user study

12 experienced infographic designer

2. Human-AI interaction patterns



Integrating story goals and creator intent to human-AI co-creation

Adjustment Rates

- Highlights: 41.0%
- Icons: 39.3%
- Text: 17.9%
- Charts: 4.0%

storytelling infographic must not only align the story goal but also integrate the subjective content from the final

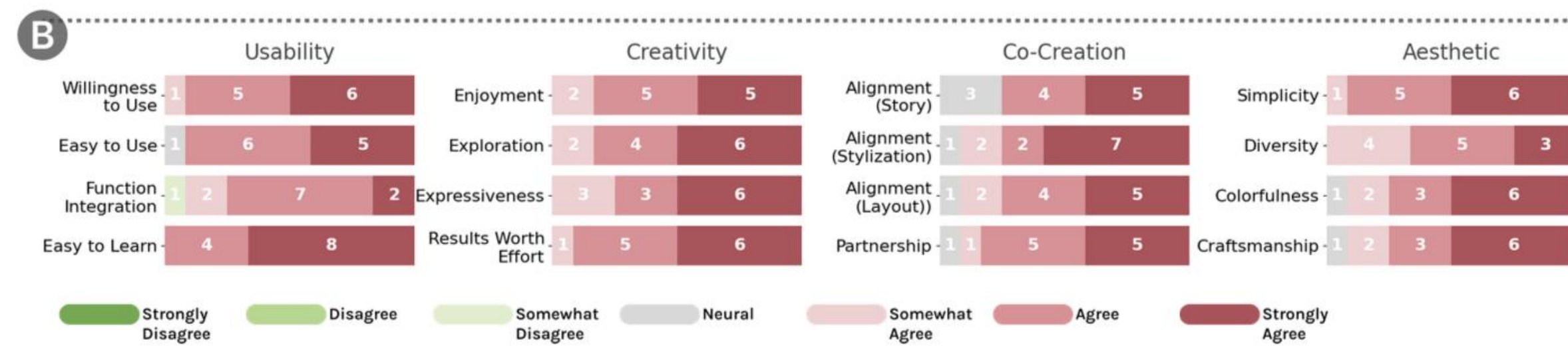
Efficiency wins in total (SD=8.5)

Evaluation & Findings

Mix-method, task-based user study

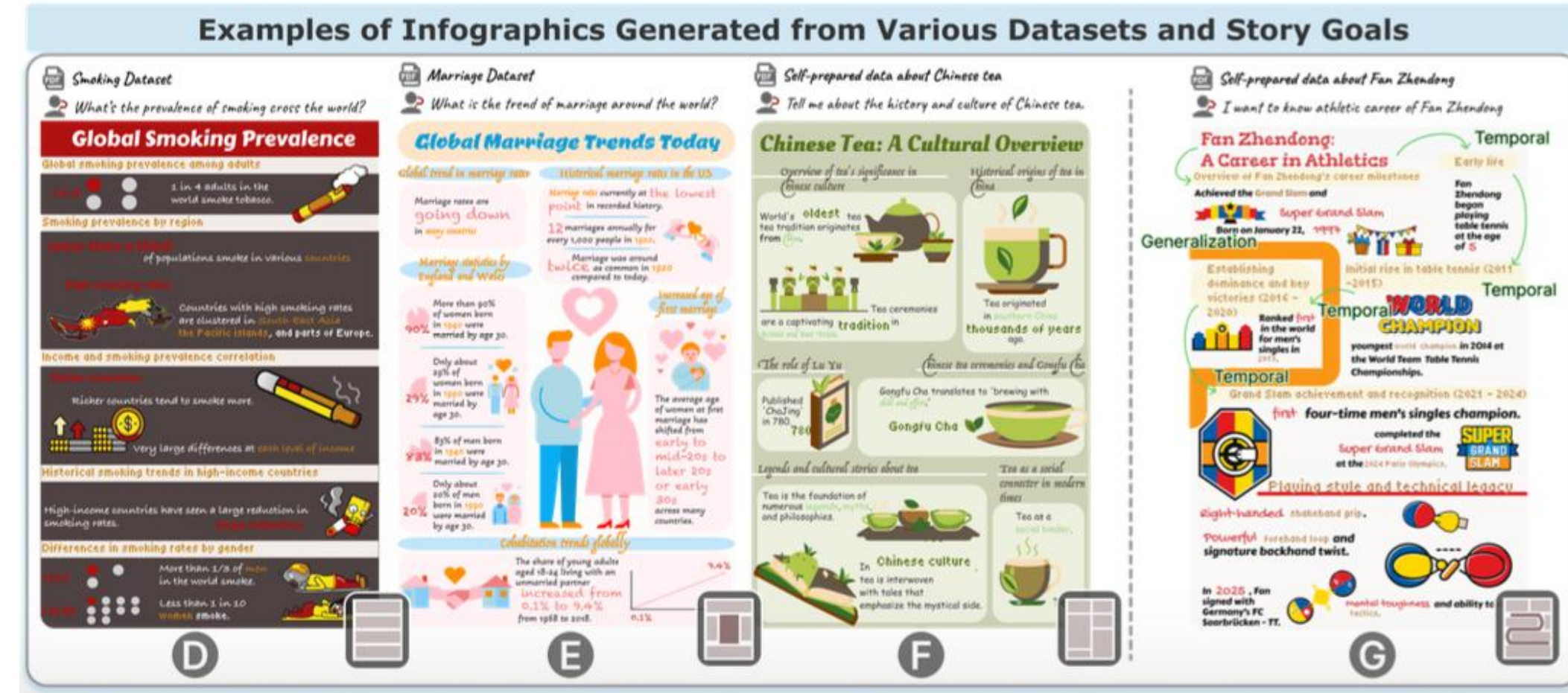
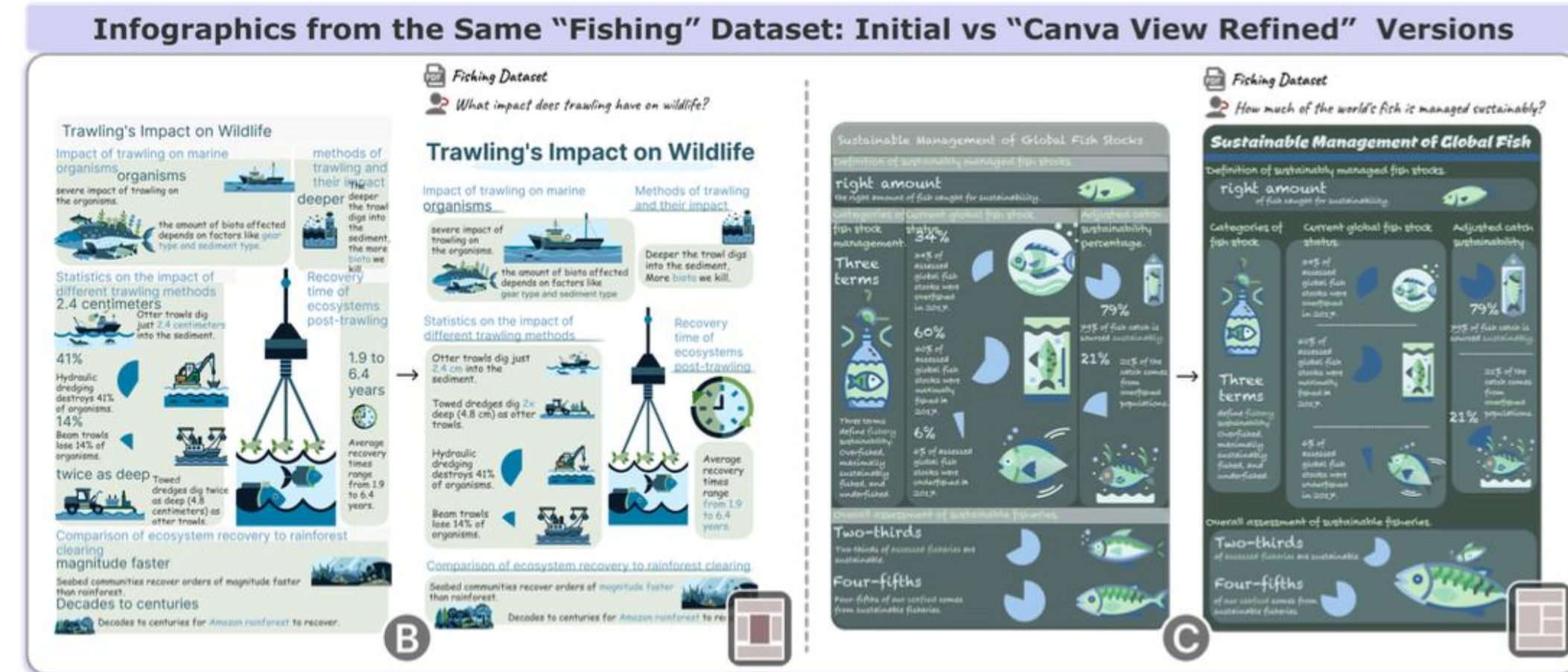
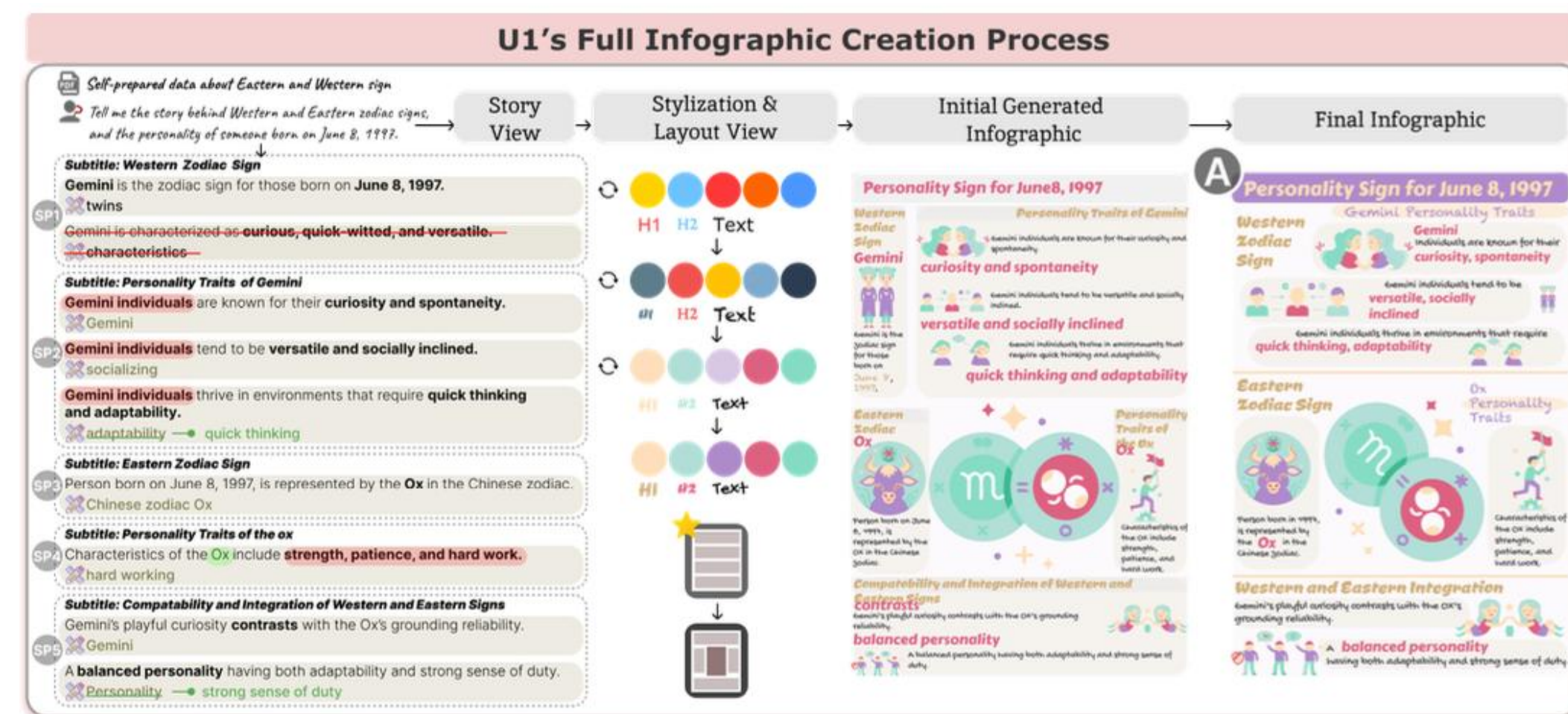
12 experienced infographic designer

3. Overall system effectiveness



- Usability: $M=6.27$, $SD=0.84$
- Creativity Support: $M=6.31$, $SD=0.75$
- Human-AI Co-Creation: $M=6.10$, $SD=1.04$
- Aesthetics: $M=6.17$, $SD=0.88$

Automation \longleftrightarrow Expressive freedom



Discussion

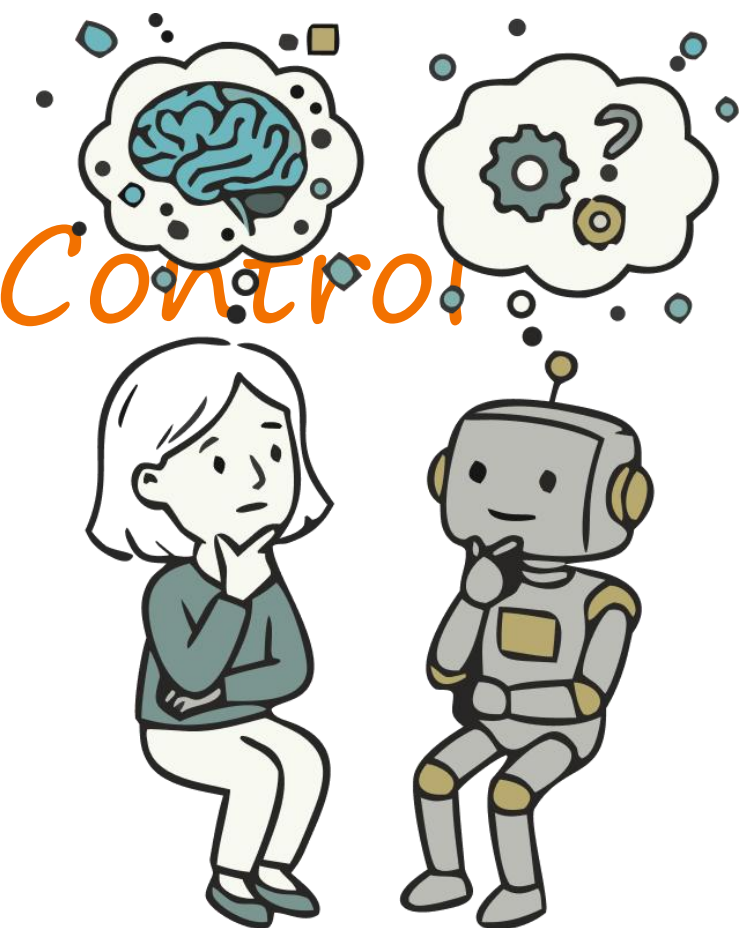
Narrative-Centric Workflows Beyond Infogra

- E.g., posters, slides, data comics, data video
- Shared core principle (narrative-centric)
- Lowers the barriers to visual storytelling



Balancing AI Automation with Human-in-the-Loop Control

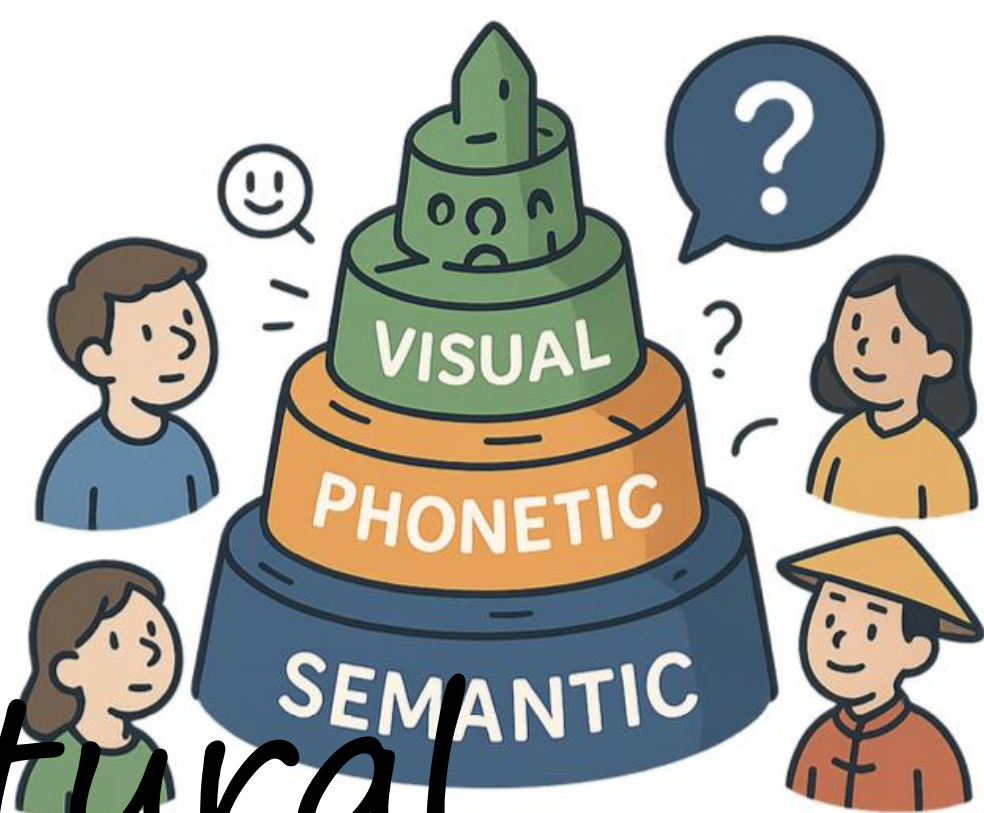
- Users still want to intervene and need authorship
- Too much structure may limit expression



Richer Input and Adaptive Visual Stories Creati

- Different inputs may require different story   res
- Multimodal input creates new opportunities   
- Future direction: adaptive, user-specific story  

CHI'26



Tower of Babel in Cross-Cultural Communication:

A Case Study of #Give Me a Chinese Name# Dialogues During the "TikTok Refugees" Event



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Zhibo Yang¹



Jingyi Zhao¹



Yujia Li¹



Xinwu Ye^{1 2}



Xingyu Lan^{*1}



Siming Chen^{*1}



¹Fudan University

²The University of Hong Kong

^{*}

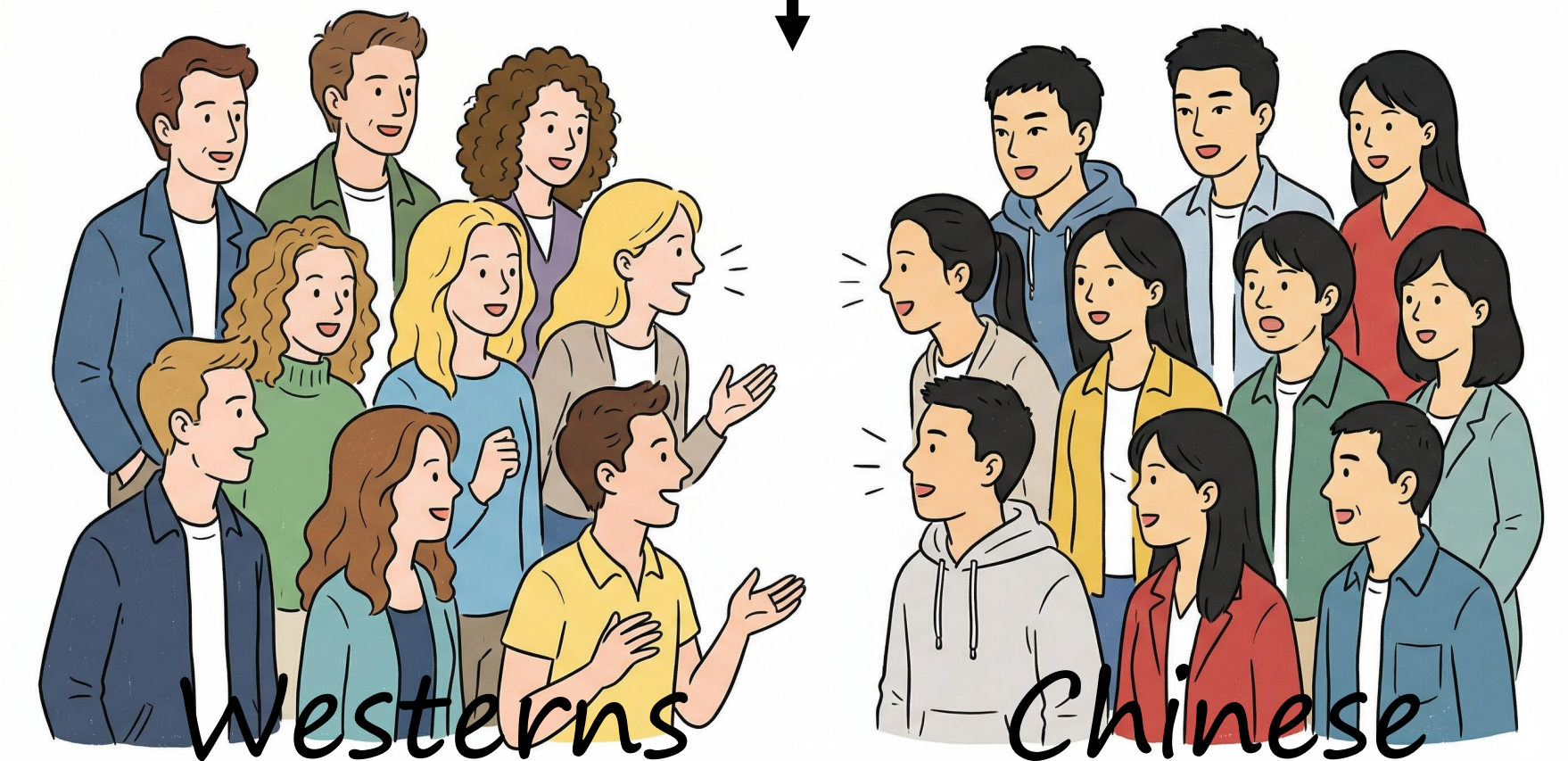
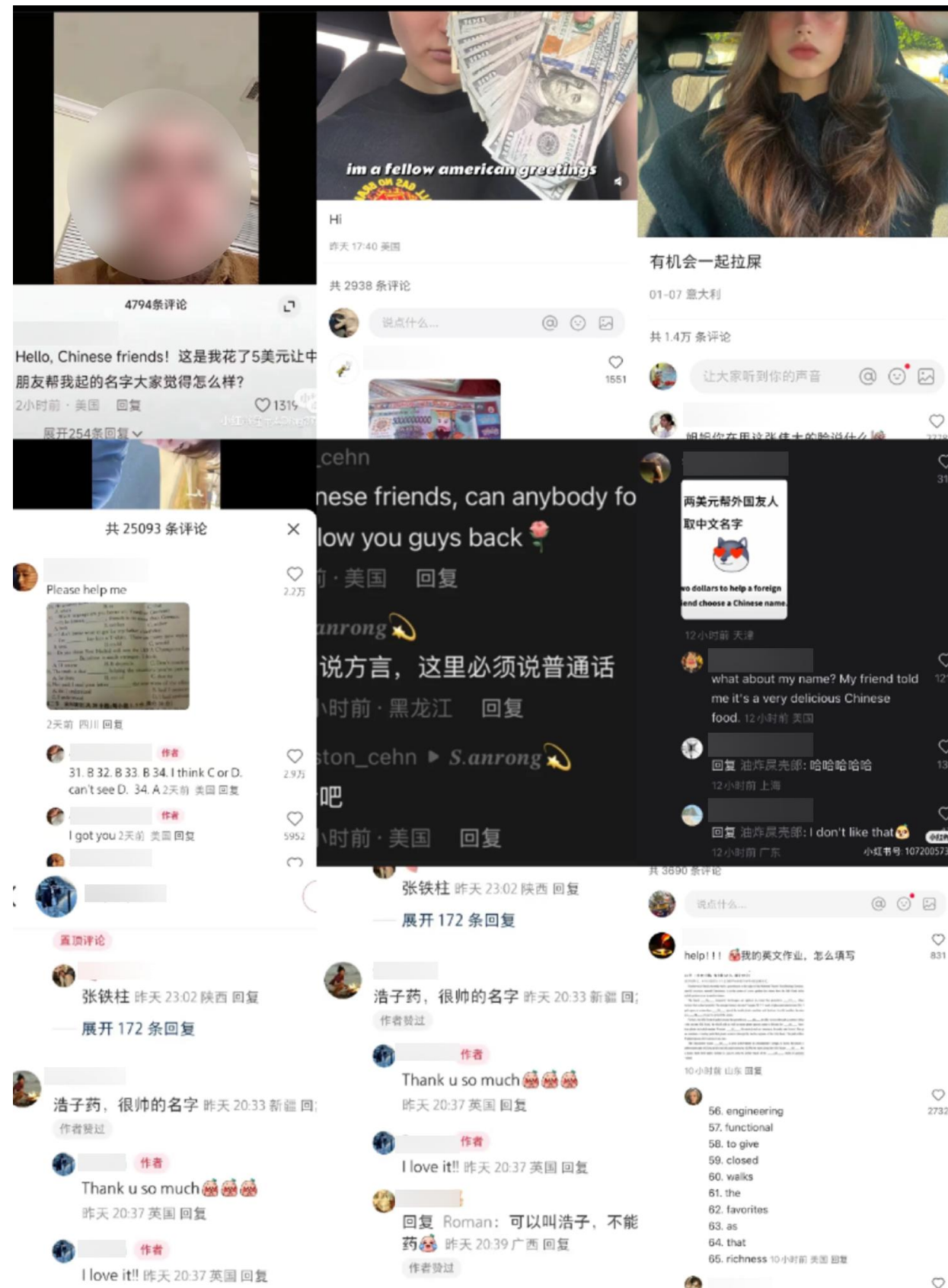
Background

In Early 2025, "TikTok refugees" Western newcomers
3 millions +



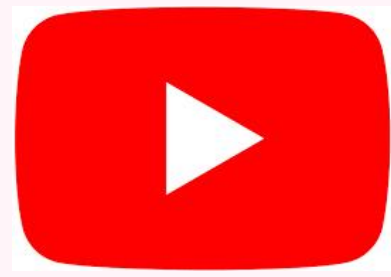
Chinese social media platform

direct encounters



Gap

Previous research has examined various platforms and user behaviors



...



Single cultural context
Monolingual groups

Danmaku, Comments, Hashtags, Addiction, Self-presentation ...

Cross-culture communication (Western newcomers → China)

Critical, yet underexplored



Timely opportunity



#Give me a Chinese Name#

Naming is often the *first step* of *cross-cultural int*

Naming is intricate challenging, it's *more than tra*

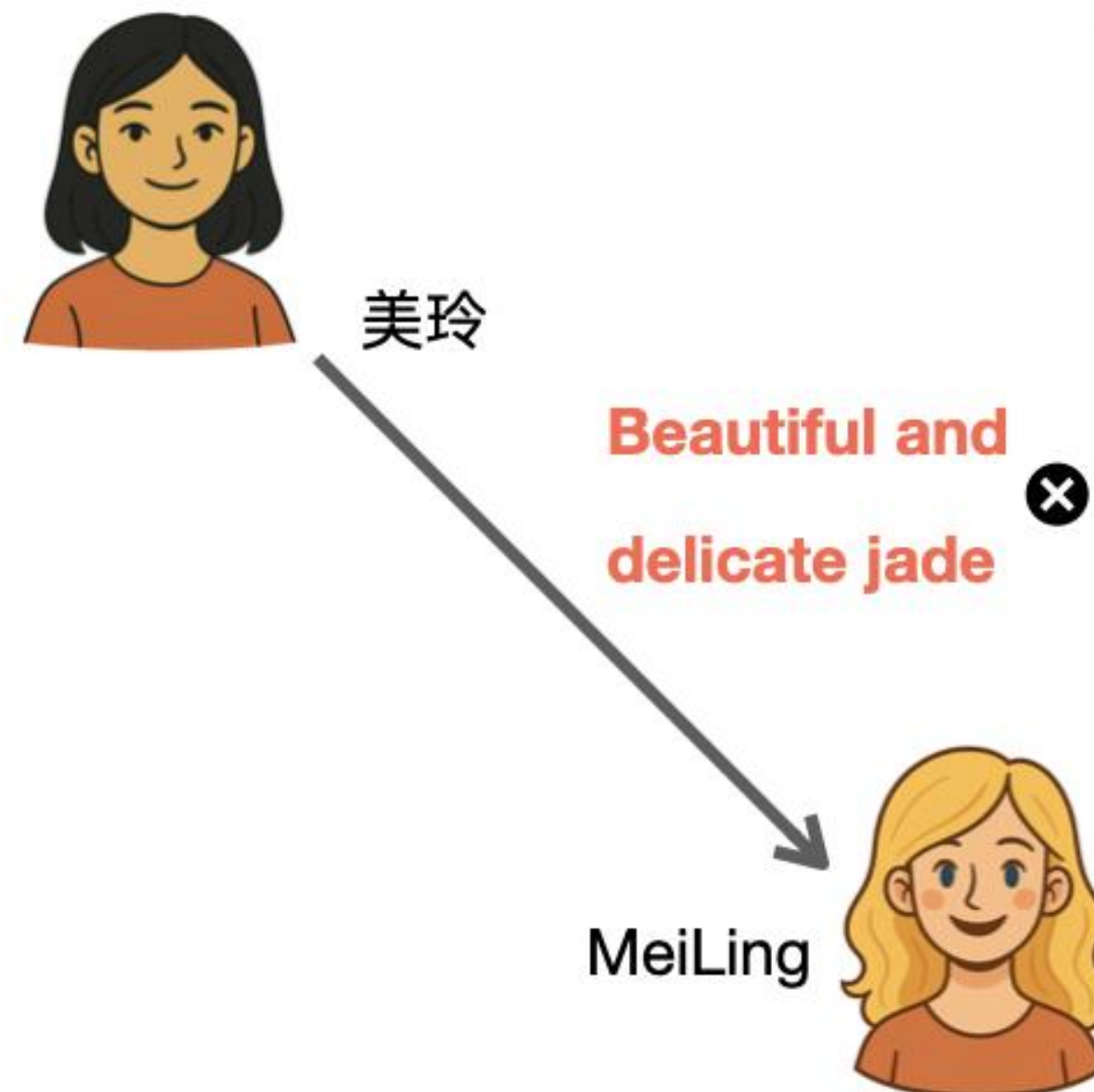
- Identity marking
- Performative power
- Symbolic meaning



Translation may only handle surface-level language

Complex

Modern "Babel Tower"



Research Space

Research Questions

- RQ1: What information encoding strategies are employed in the naming process?
- RQ2: How are these encoding strategies combined or layered, thereby increasing the complexity of the naming process?
- RQ3: What are the frequency and distribution of these strategies?

How such "Tower of Babel" is formed and constructed?

Challenges

1. Analyzing large, noisy, multilingual, and high-context corpus.
2. Multiple layers of cultural, semantic, and contextual meaning that cannot be captured by traditional methods.

A human-AI approach for structuring cross-cultural corpora at scale.

→ A multi-channel framework and analysis.

Data

Supplemented **CHI'26**

- Poster's photo
- Poster's foreign name

- Tag-based
- 21/1 ~ 24/2, 2025
- 200 likes+ or 50 comments+ or direct interaction
- 318 valid posts
- 70614 comments

Posters' Foreign Name

Posters' Photo

Example Comments

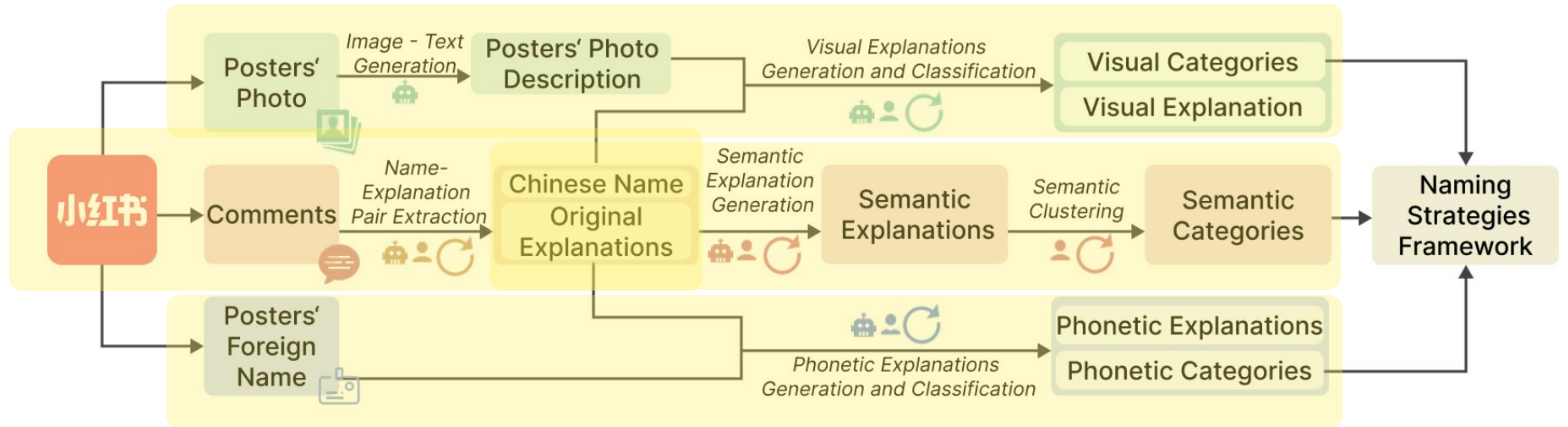
Comments with Name and Explanation

Comments with Name Only

Comments with Multiple Names

Comments Unrelated to Naming

A Human-AI Approach for Structuring Cross-Cultural Corpora at Scale



Name-Explanation Pairs Extraction Missing and Incomplete Explanation Generation

Name-Explanation Pair Extraction



6 Rounds Iterative Refinement

- Manual Extraction
- DeepSeek Only (D)
- D+Data Processing&Prompt Enhancement (P)
- D+P+Crowdsourcing with five independent DeepSeek mo.
- D+P+CD+Consistency-guided human correction (H)
- D+P+Crowdsourcing with five different and independent
- D+P+CF+H

ID	Error Patterns	Example	Correction Rule
1	Explanations contain emojis or emoticons that confuse interpretation	“好厉害 [emoji][emoji]”	Remove emojis or emoticons from the explanation
2	User @-mentions are extracted as names	“@ 张三你真棒”	Set name and explanation to <i>null</i>
3	Single-character entries, which are invalid in Chinese naming (surname + given name)	“晴”, “马”	Set name and explanation to <i>null</i>
4	Purely foreign names, which are outside the scope of Chinese naming practices	“John”	Set name and explanation to <i>null</i>
5	Non-assigned names mentioned in explanations	“张华, 把李华位置抢了”	Keep “张华” as the name; set “李华” to <i>null</i>
6	Redundant or nested extractions	“张谕艺” and “谕艺”	Keep the full name only; set redundant entry to <i>null</i>
7	Explanations that are meaningless or unrelated	“马赫比较好一些”	Set explanation to <i>null</i>
8	Unusual or playful names not recognized by the model	“萝卜土豆切吧切吧”	Manually correct into a valid name and explanation

consistency scores for identical vs different

Performance

(a) Consistency scores across five independent DeepSeek models					
Outcome	0	40	60	80	100
Correct (Matched gold)	0 (0%)	3 (0.07%)	189 (4.26%)	164 (3.70%)	4077 (91.97%)
Correct (Minor diff.)	0 (0%)	6 (3.31%)	28 (15.47%)	21 (11.60%)	126 (69.61%)
Incorrect	0 (0%)	2 (0.52%)	55 (14.25%)	46 (11.92%)	283 (73.32%)

(b) Consistency scores across five different and independent LLMs					
Outcome	0	40	60	80	100
Correct (Matched gold)	2 (0.04%)	55 (1.22%)	230 (5.11%)	385 (8.55%)	3833 (85.08%)
Correct (Minor diff.)	10 (3.46%)	89 (30.80%)	105 (36.33%)	54 (18.69%)	31 (10.73%)
Incorrect	12 (5.83%)	58 (28.16%)	80 (38.83%)	39 (18.93%)	17 (8.25%)

Iteration	Accuracy (%)	Efficiency (hours)	Human effort
Round 0: Manual extraction	–	Estimated 784.6	Direct coding by at least 3 coders
Round 1: Baseline	67.84	14.1	None
Round 2: D+P	92.16	21.2	None
Round 3: D+P+CD	92.28	21.2	None
Round 4: D+P+CD+H	94.34	21.2	Manual review of flagged cases
Round 5: D+P+CF	95.88	23.6	None
Round 6: D+P+CF+H	99.66	23.6	Manual review of flagged cases

Semantic Channel Explanation Generation



Iterative Human Review & Error Patterns

Error Pattern	Example	Correction Rule
Subjective judgments	“This is a beautiful name”	Avoid personal opinions; provide only factual or descriptive content
Vague or generic explanation	“This name has cultural meaning”	Specify concrete sources when referring to cultural references or memes
Ignoring negative or satirical intent	Interpreting “BYD” only as a car brand	Remain neutral and acknowledge vulgar or satirical meanings when present
Factual errors or hallucinations	Misattributing a meme to the wrong source	Ground explanations in authentic cultural usage
Redundant outputs	“This name has no special meaning”	Omit unnecessary or irrelevant explanations
Overly divergent associations	Linking a rare word to obscure folklore	Restrict explanations to widely recognizable associations
Neglecting the original explanation	Skipping irony in the commenter’s note	Incorporate the original explanation into the final output
Misaligned with context	Treating “马云” literally as the entrepreneur	Infer the most plausible meaning in the social media context
Forced interpretation	Claiming “贝奇” relates to “备齐” without evidence	Do not generate far-fetched links when no reasonable connection exists

Visual Channel Explanation Generation

8 visual attribute

Generation based on:

- Name
- Original explanation
- Image description

Category	Definition	Example
Demeanor	The Chinese name is associated with the demeanor or aura suggested by the photo (e.g., calm, fierce).	<i>Focused and slightly serious demeanor</i> → “安睿 (thoughtful) + 肃 (serious)”
Facial features	The name reflects distinctive facial traits (e.g., nose, eyes, face contour).	<i>Large round eyes</i> → “大眼 (Big-Eyed) 丽莎”
Hair	The name references hair style, length, or color.	<i>Brown, curly hair</i> → “卷毛 (Curly Hair)”
Skin tone	The name highlights skin color or tone visible in the photo.	<i>Fair skin tone</i> → “白 (Fair) + 洁 (Pure)”
Facial expression	The name connects to an expression captured in the photo (e.g., smiling, angry, surprised).	<i>Smiling expression</i> → “林乐乐 (Cheerful and smiling)”
Clothing / accessories	The name draws from clothing items or accessories visible in the image.	<i>Wearing a dark red hoodie</i> → “小红帽 (Little Red Hood)”
Background	The name reflects the setting or object in the background of the photo, but only when salient and clearly displayed.	<i>Sitting on rocks with mountain scenery in the background</i> → “明远山 (Distant Mountains)”
No visual association	No relevant visual cue in the photo can support a connection between the name and the image.	Return <i>null</i>

Phonetic Channel Explanation Generation

4 phonetic attribute

Generation based on:

- Name
- Original explanation
- Foreign Name

Category	Definition	Example
Full homophony	The full Pinyin pronunciation of the Chinese name closely matches the foreign name, allowing for minor phonetic shifts such as tone omission or consonant alternation.	“Stefan” → “史德风 (shǐ dé fēng)”
Partial homophony	A meaningful component of the Chinese name (e.g., surname or single character) phonetically matches part of the foreign name.	“Maher” → “马永安 (mǎ Yǒng ān)”
Meaning association	The Chinese name conveys meaning, imagery, or symbolism that aligns with the foreign name, often supported by the original explanation.	“Art” → “张画 (Huà, art paintings)”
No relation	No clear phonetic or semantic connection exists between the Chinese and foreign names.	Return <i>null</i>

Refining and Validating Channel-Specific Explanations

Harder

- More *subjective*
- Multiple plausible explanations
- Can *not* rely on *model voting*



Our Solution

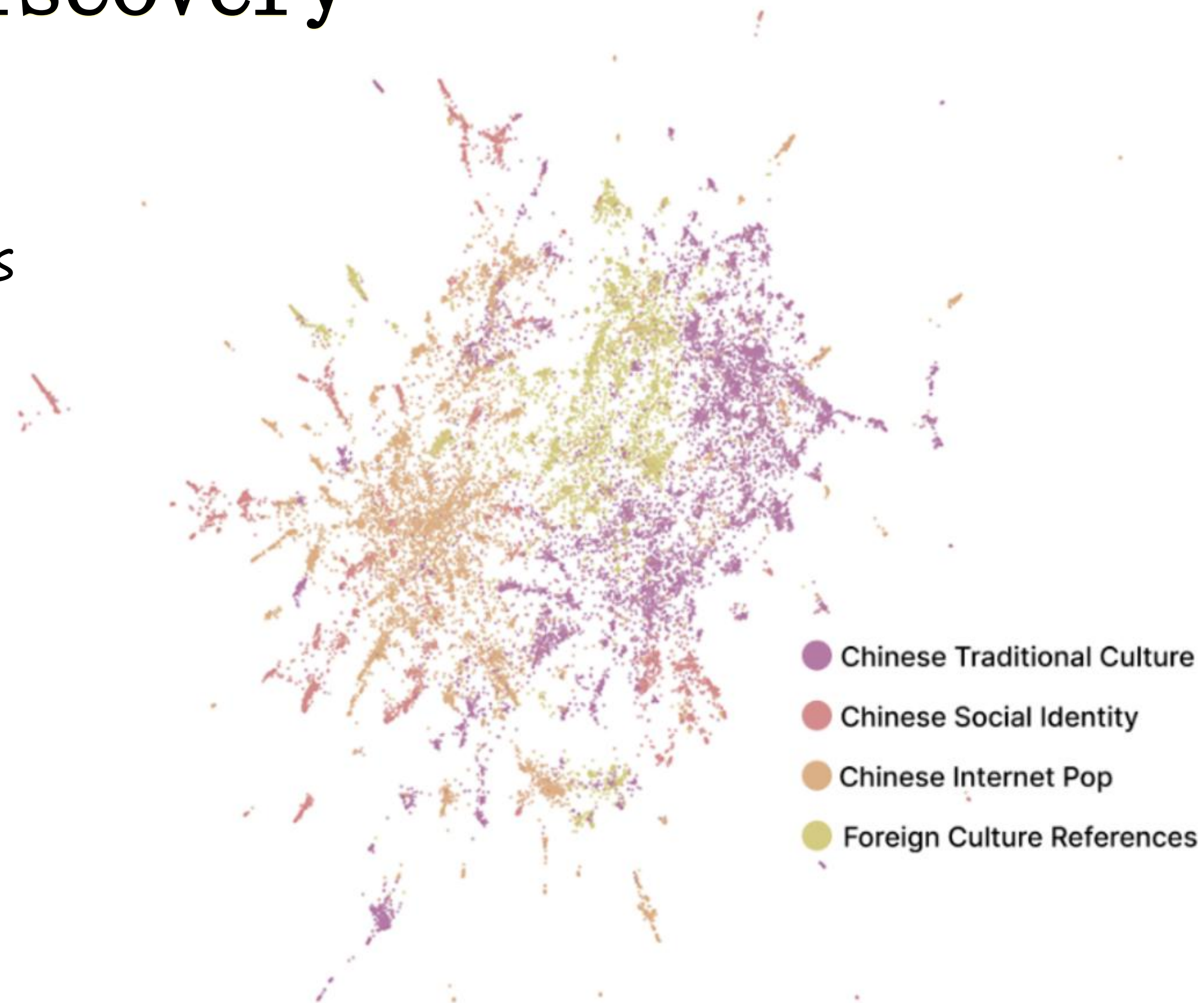
- 4 Coders
- 3 rounds iterative refinements
- Human review for ambiguous cases

- 97% Accuracy
- 98.5% Consistency
- 96.7% Contextual Appropriateness
- 95.2% Overall



Semantic Pattern Discovery

31 Semantic Naming Strategies



2D Projection of *manually adjusted* semantic patterns using

Information encoding strategies are employed in the name

Framework

31 Semantic Strategies in 3 levels

- Foreign Cultural References (15.78%)

Converging e.g., 乔·埃里克森

- Chinese Traditional Culture (40.66%)

e.g., 高博飞

In-Grouping

- Chinese Social Identity (13.64%)

e.g., 铁蛋

As-if In-Grouping

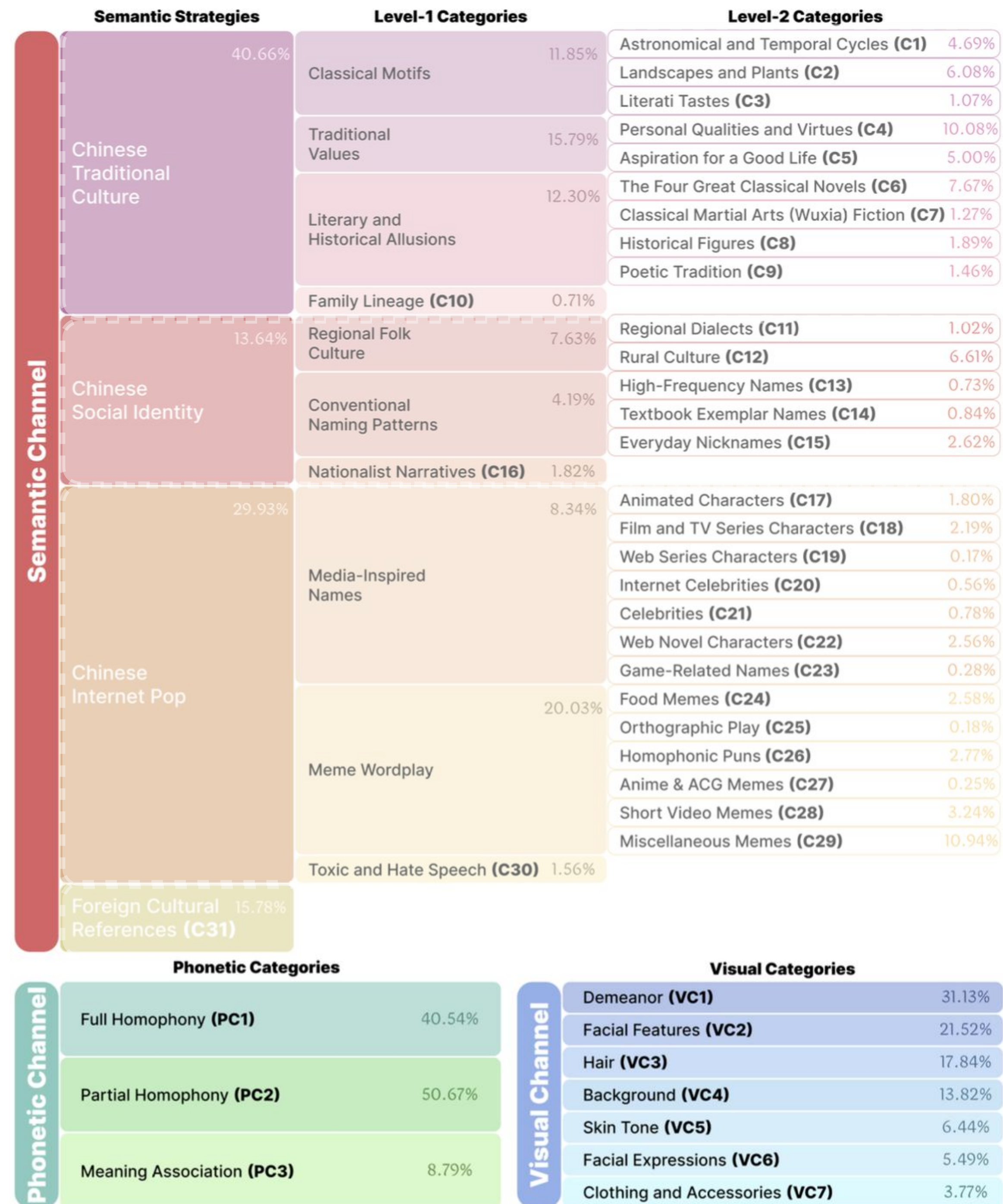
- Chinese Internet Pop (29.93%)

e.g., 猪猪侠

Out-Grouping

3 Phonetic Strategies

8 Visual Strategies



RQ2: How are these encoding strategies combined or layered, thereby increasing the cost of cross-cultural communication?

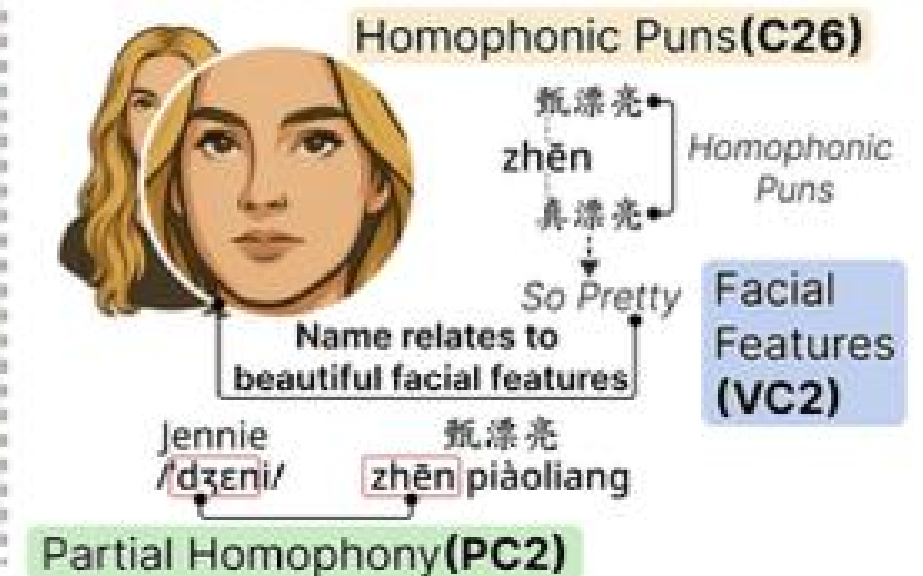
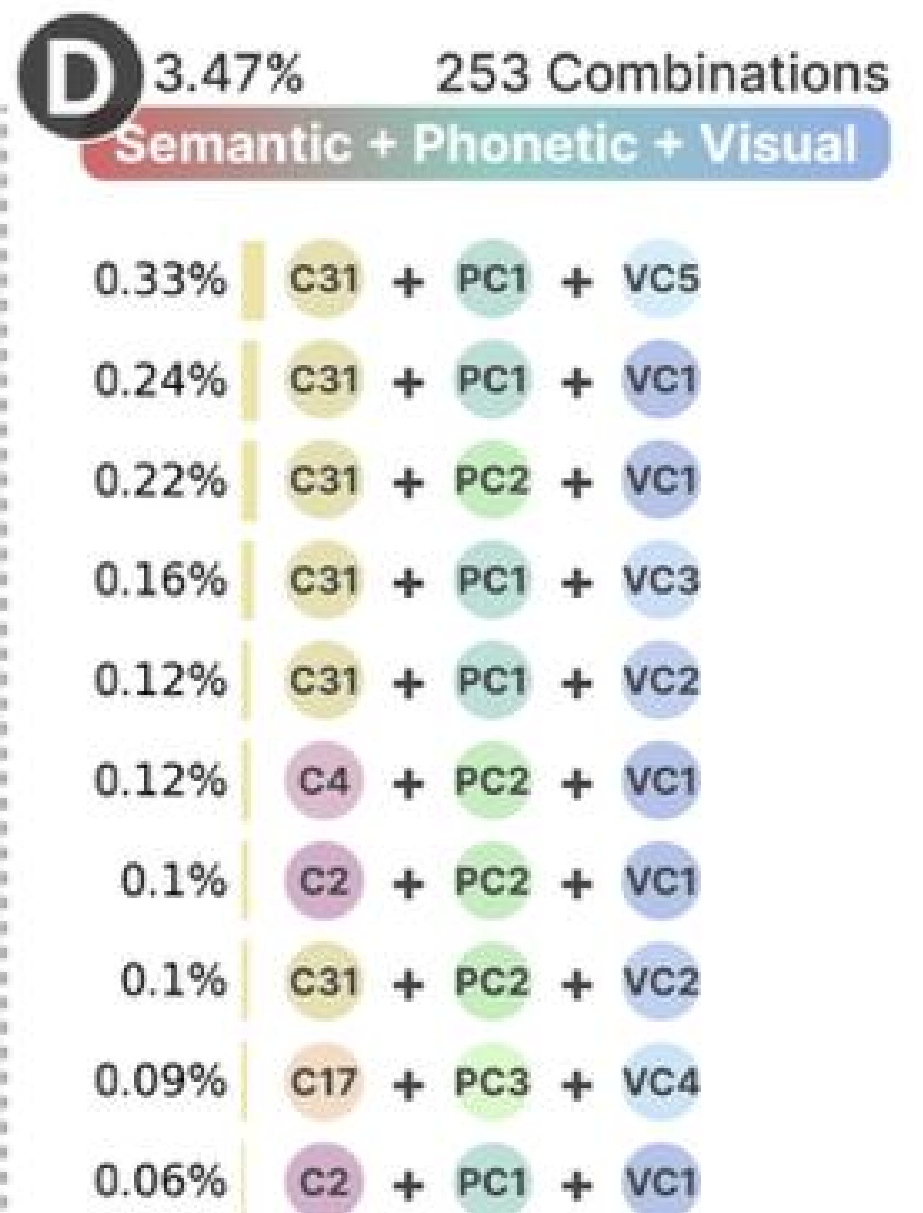
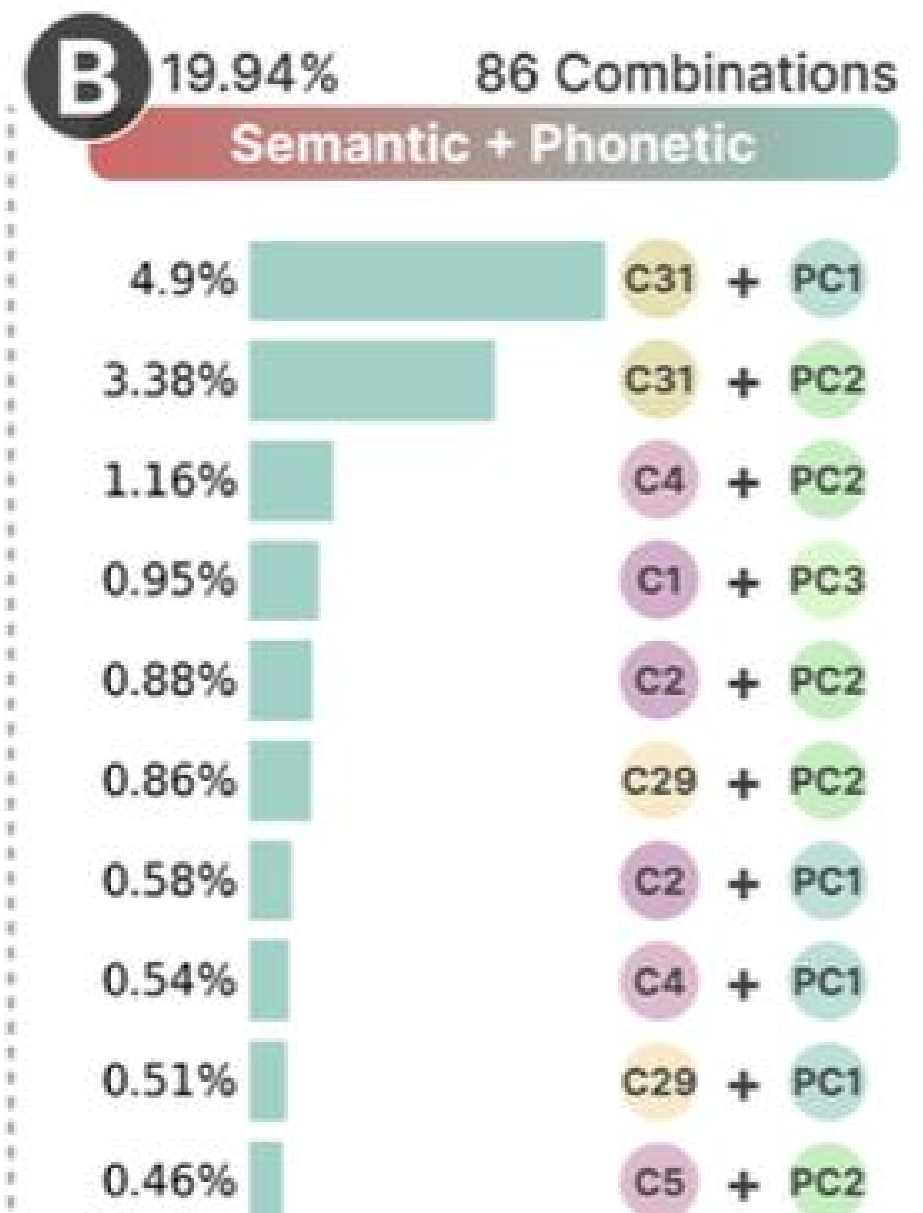
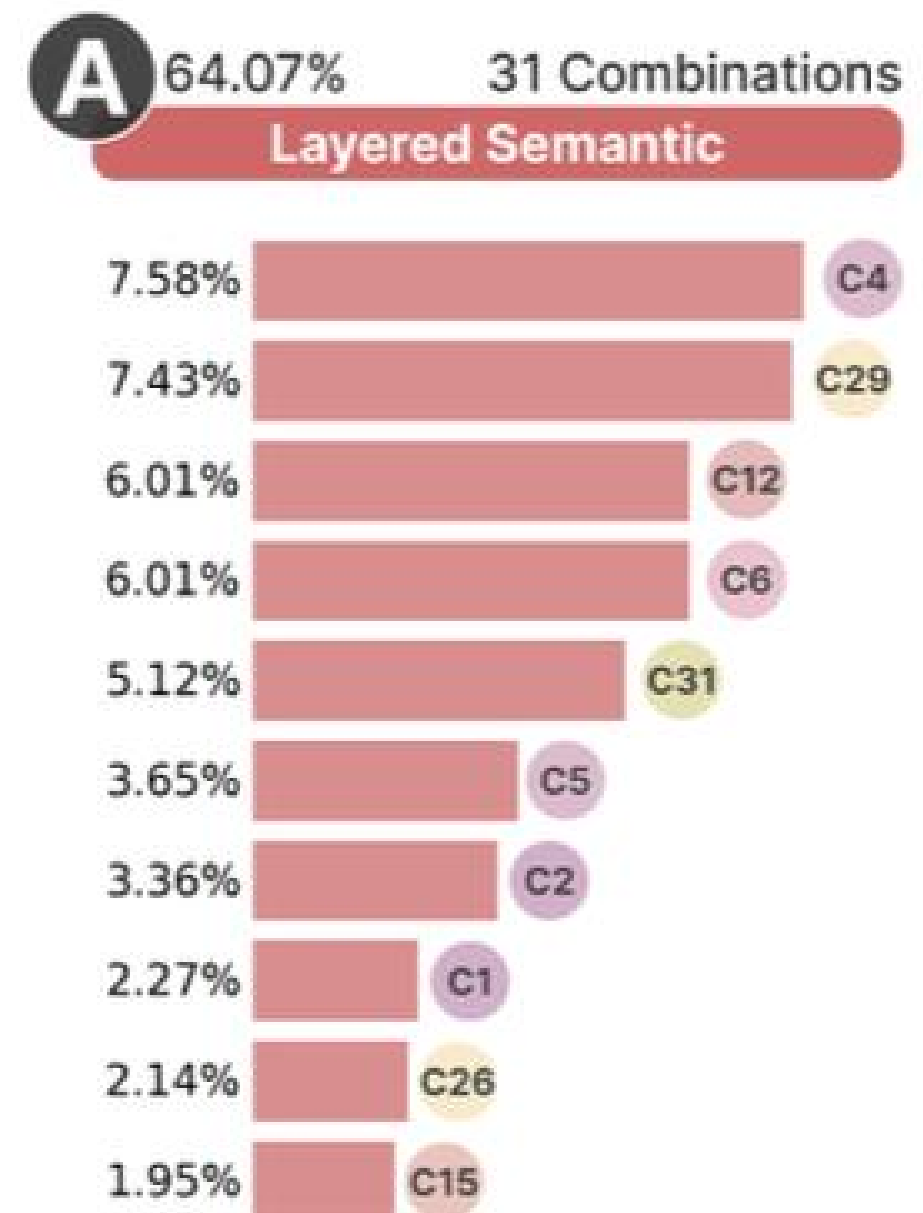
How the Strategies are Combined?

4 high-levels combinations

H1: Multi-layered semantic channels will be prioritized. ✓

H2: In dual-modal en-coding, phonetic channels tend to be favored. ✓

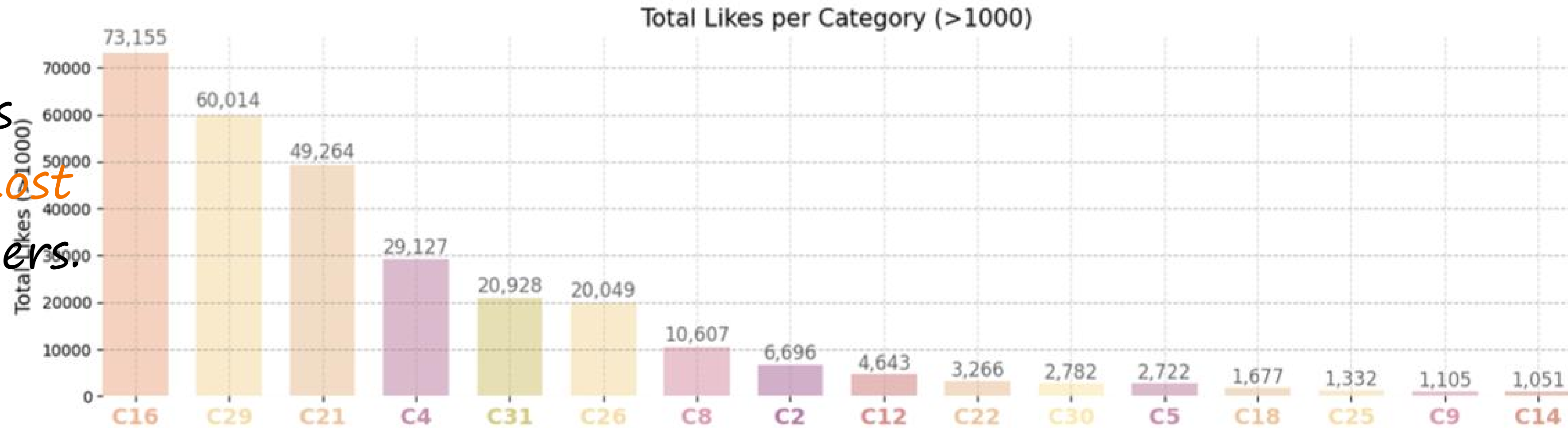
H3: Names encoded through a single channel will be most frequent, and their frequency will decrease as more channels are added. ✓



RQ3: What are the frequency and distribution of these strategies?

Engagement Analysis

The *most common* names are *not* necessarily the *most visible* to foreign newcomers.



Bakhtin's Theory of Carnival

- Parody
- Degradation
- Coarse Expression

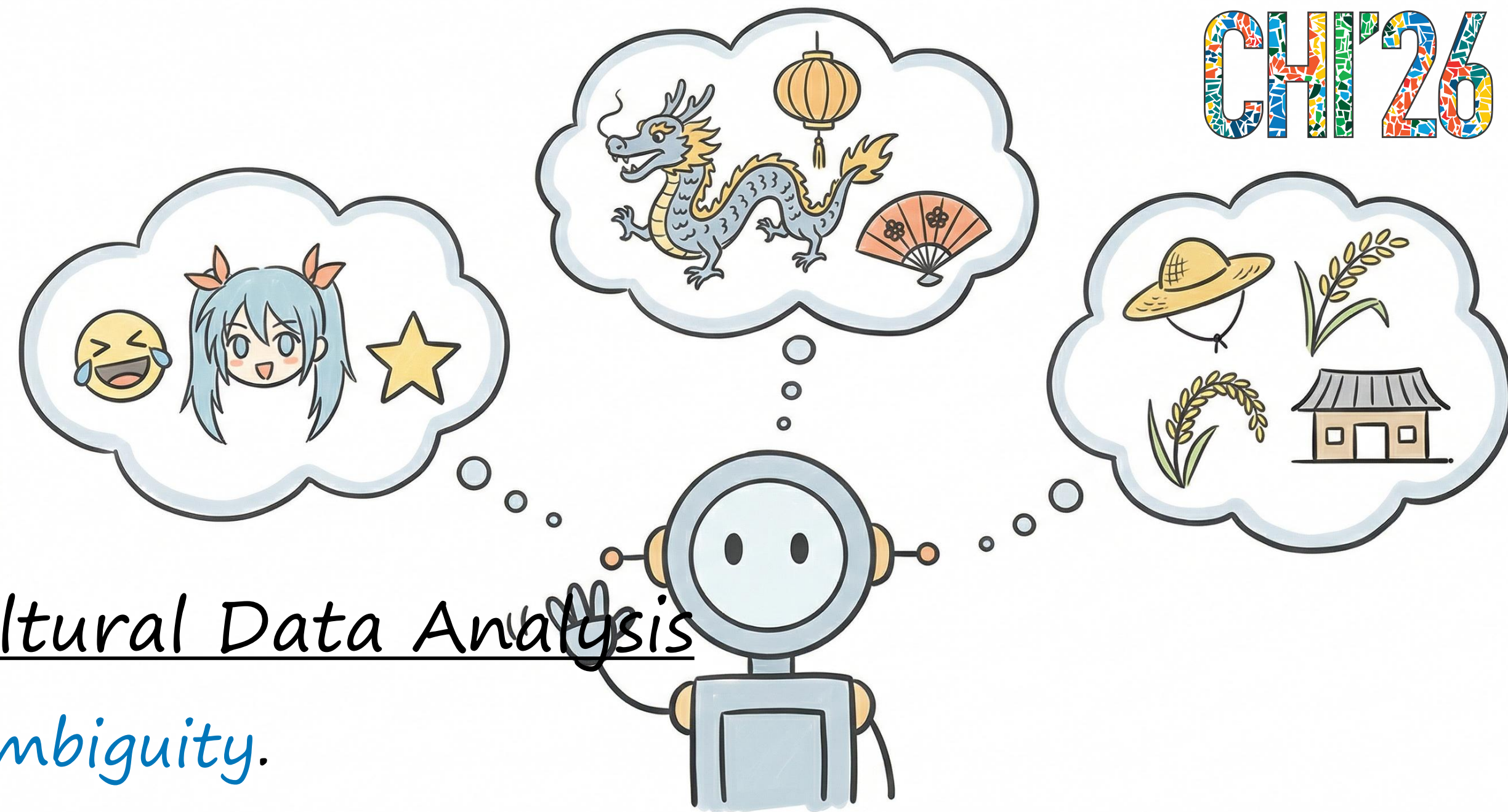


Naming strategies
Distributions
Visibility

Shape

Final presence of
"Babel Tower"

Key Implications



- Methodological Implications for Cross-Cultural Data Analysis
 - LLMs : synthetic crowd, Humans : cultural ambiguity.
 - LLMs have the ability to augment human cultural interpretation
 - Future Agenda: culturally enriched AI for high-context social media
- Implications for Cross-Cultural Communication and Platform Design
 - Digital platforms can turn insider culture into social boundaries
 - Platform should govern cultural ambiguity, not just restrict it
 - From semantic to cultural translation
 - Future Agenda: How different platforms shape cross-cultural meaning and boundaries

复旦大学可视分析与智能决策实验室 (FDUVIS)

<http://fduvis.net/>

- 复旦大学可视分析与智能决策实验室 (FDU-VIS) 成立于2020年9月，我们的研究方向涵盖了可视化与可视分析、人机混合智能、用户行为分析、决策支持与数据新闻故事叙述等，并在多个应用领域，包括社交媒体、网络空间安全、时空城市大数据、人文历史数据与金融科技方面有一定的科研成果。



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