

Supplementary Information

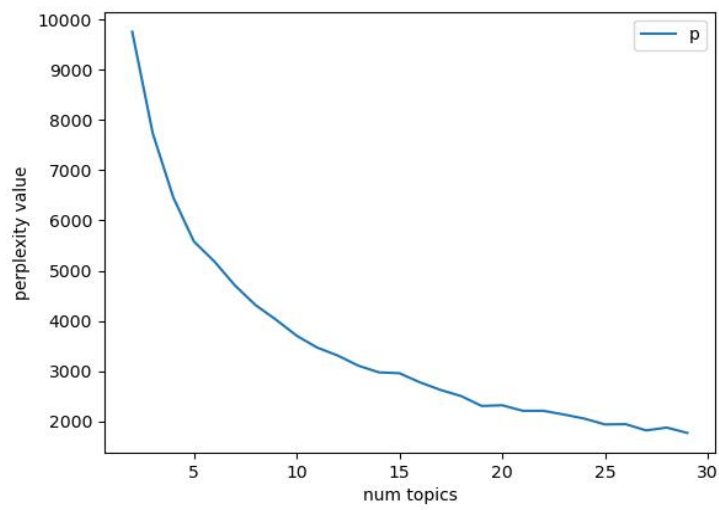
For Manuscript:

“Developer Evidence and User Satisfaction in Mental Health Apps

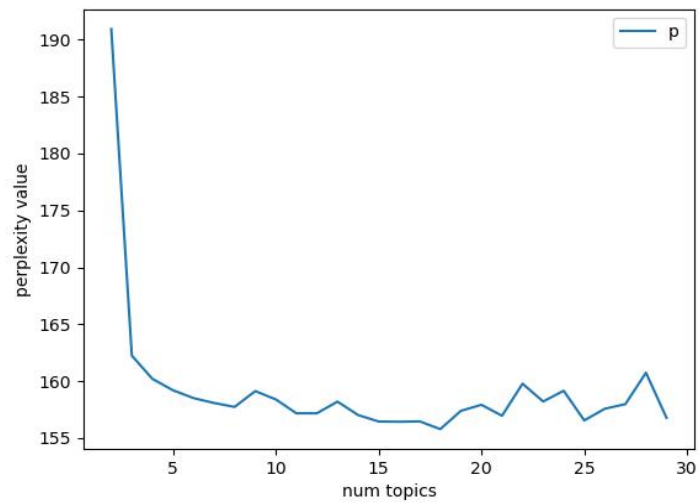
Across China and the United States”

Contents

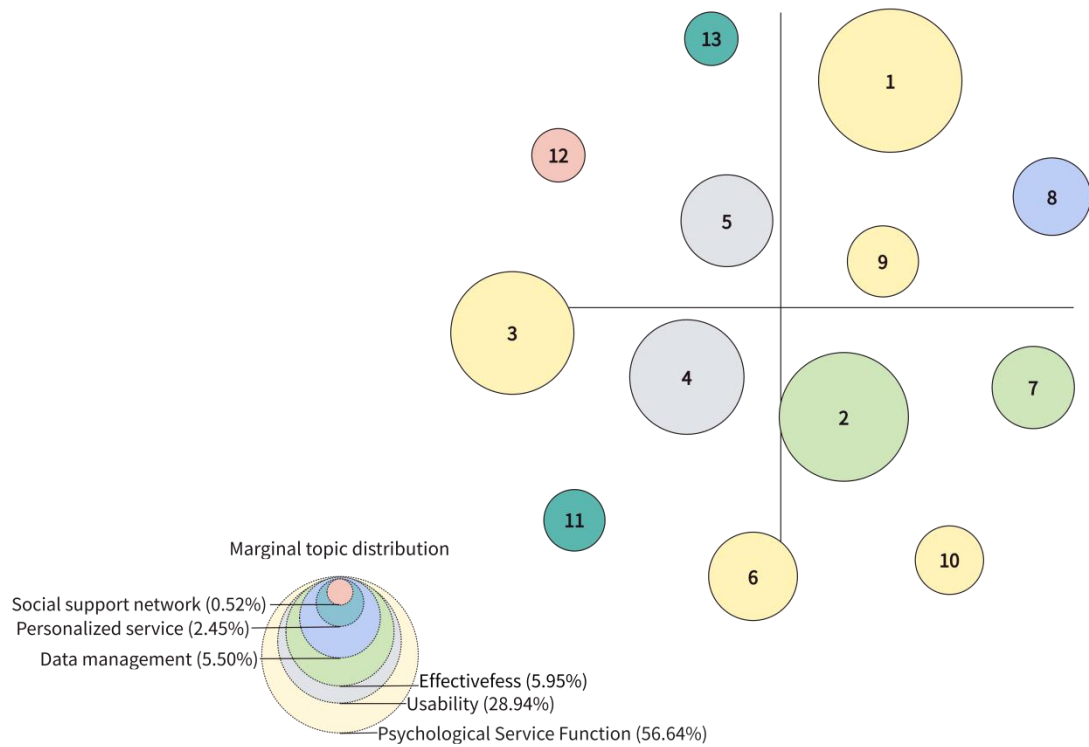
Supplementary Figures 1-8.....	2
Supplementary Tables 1-21.....	7
Supplementary Notes 1-3.....	33



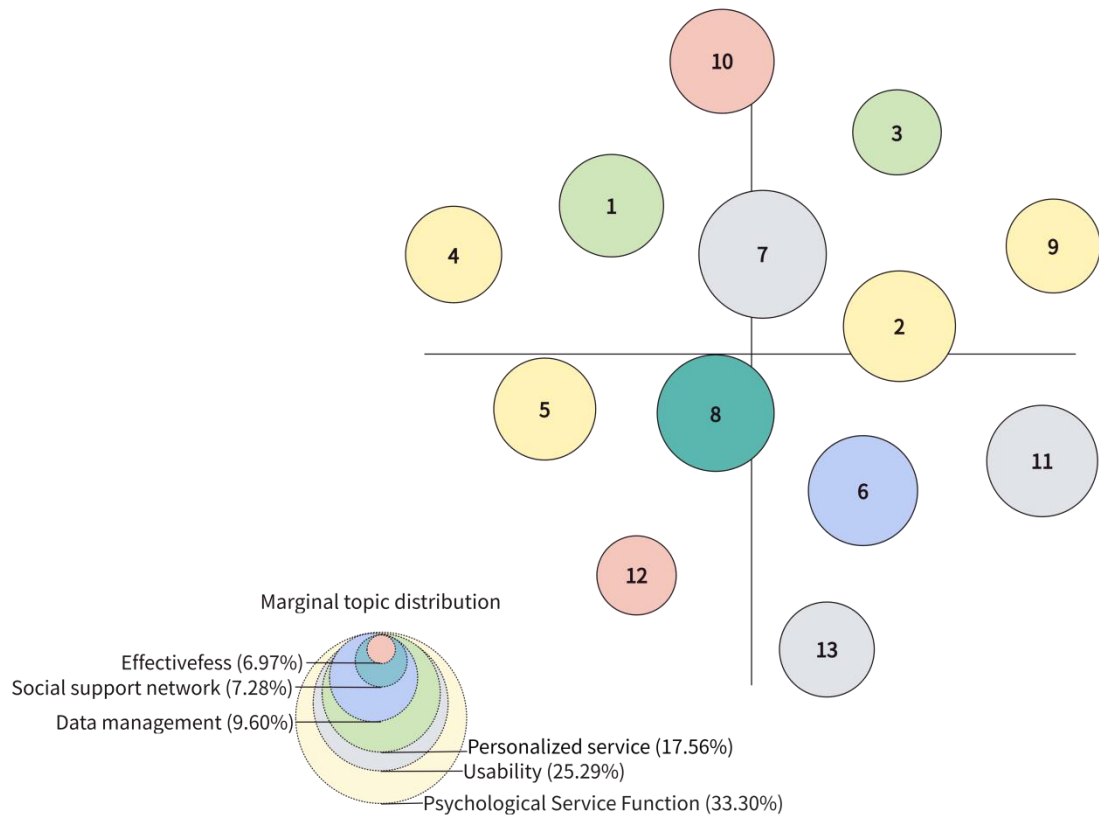
Supplementary Figure 1: Topics perplexity score (rang between 2 and 29 topics) of Chinese reviews. num: number



Supplementary Figure 2: Topics perplexity score (rang between 2 and 29 topics) of English reviews. num: number



Supplementary Figure 3: presents the topic modeling results derived from Chinese user reviews using Latent Dirichlet Allocation (LDA). The analysis identified 13 distinct thematic clusters: 1. Mental health assessment; 2. User service; 3. Online consultation function; 4. Effectiveness; 5. User feedback; 6. Emotional management function; 7. Interface design; 8. Privacy and security; 9. Affective state tracking; 10. Emotional motivation function; 11. Psychological education courses; 12. Social support; 13. Personalized service.



Supplementary Figure 4: presents the topic modeling results derived from English user reviews using Latent Dirichlet Allocation (LDA). The analysis identified 13 distinct thematic clusters: 1. Psychological education courses; 2. Emotional management function; 3. Personalized service; 4. Stress management function; 5. Online consultation function; 6. Privacy and security; 7. Usability; 8. Social support; 9. Meditation practice; 10. Cost; 11. Interface design; 12. User feedback; 13. User service.

Criterion layer	Psychological service	Validity	Usability	Personalized service	Social support	Privacy and Security	Feature vector
Psychological service	1	9	5	9	9	9	0.5788
Validity	1/9	1	1/4	1	1	1	0.0538
Usability	1/5	4	1	5	5	4	0.2092
Personalized service	1/9	1	1/5	1	1	1	0.0521
Social support	1/9	1	1/5	1	1	1	0.0521
Privacy and Security	1/9	1	1/4	1	1	1	0.0538

CR=0.0166<0.1, passing consistency check

Supplementary Figure 5: Criterion layer judgment matrix of China's user satisfaction evaluation indicator system

a. Psychological service function judgement matrix

Psychological service	Psychological health assessment	Online consultation	Emotion management	Emotional tracking	Emotional motivation	Feature vector
Psychological health assessment	1	4	5	6	5	0.545
Online consultation	1/4	1	2	2	2	0.174
Emotion management	1/5	1/2	1	1	1	0.095
Emotional tracking	1/6	1/2	1	1	1	0.091
Emotional motivation	1/5	1/2	1	1	1	0.095

CR=0<0.1, passing consistency check

b. Validity judgement matrix

Validity	Validity	User feedback	Feature vector
Validity	1	1	0.5
User feedback	1	1	0.5

A second-order matrix is a consistency matrix

c. Usability judgement matrix

Usability	Interface design	User service	Feature vector
Interface design	1	1	0.5
User service	1	1	0.5

A second-order matrix is a consistency matrix

d. Personalized Services judgement matrix

Personalized Services	Personalized service	Psychological education course	Feature vector
Personalized service	1	1	0.5
Psychological education course	1	1	0.5

A second-order matrix is a consistency matrix

e. Social Support judgement matrix

Social Support	Social function	Feature vector
Social function	(1)	(1)

A first-order matrix is a consistency matrix

f. Privacy and Security judgement matrix

Privacy and Security	Data privacy	Feature vector
Data privacy	(1)	(1)

A first-order matrix is a consistency matrix

Supplementary Figure 6: Criterion layer judgment matrix of China's user satisfaction evaluation indicator system

Criterion layer	Psychological service	Validity	Usability	Personalized service	Social support	Privacy and Security	Feature vector
Psychological service	1	8	3	5	8	7	$\begin{pmatrix} 0.4784 \\ 0.0445 \\ 0.2569 \\ 0.1251 \\ 0.0462 \\ 0.0489 \end{pmatrix}$
Validity	1/8	1	1/6	1/4	1	1	
Usability	1/3	6	1	3	6	5	
Personalized service	1/5	4	1/3	1	3	3	
Social support	1/8	1	1/6	1/3	1	1	
Privacy and Security	1/7	1	1/5	1/3	1	1	

CR=0.024<0.1, passing consistency check

Supplementary Figure 7: Criterion layer judgment matrix of the US user satisfaction evaluation indicator system

a. Psychological service function judgement matrix

Psychological service	Online Consultation	Emotional Management	Stress Management	Meditation Practice	Feature vector
Online Consultation	1	1/2	1	1/3	$\begin{pmatrix} 0.1484 \\ 0.2312 \\ 0.1945 \\ 0.4258 \end{pmatrix}$
Emotional Management	2	1	1	1/2	
Stress Management	1	1	1	1/2	
Meditation Practice	3	2	2	1	

CR=0<0.1, passing consistency check

c. Usability judgement matrix

usability	Usability	Interface Design	User Services	Feature vector
Usability	1	1	1	$\begin{pmatrix} 0.3333 \\ 0.3333 \\ 0.3333 \end{pmatrix}$
Interface Design	1	1	1	
User Services	1	1	1	

CR=0<0.1, passing consistency check

e. Social Support judgement matrix

Social Support	Social function	Feature vector
Social function	(1)	(1)

A first-order matrix is a consistency matrix

b. validity judgement matrix

validity	User feedback	Cost	Feature vector
User feedback	1	1	$\begin{pmatrix} 0.5 \\ 0.5 \end{pmatrix}$
Cost	1	1	

A second-order matrix is a consistency matrix

d. Personalized Services judgement matrix

Personalized Services	Personalized Support	Psychological Education Course	Feature vector
Psychological Education Course	1	1/4	$\begin{pmatrix} 0.2 \\ 0.8 \end{pmatrix}$
Personalized Support	4	1	

A second-order matrix is a consistency matrix

f. Privacy and Security judgement matrix

Privacy and Security	Data privacy	Feature vector
Data privacy	(1)	(1)

A first-order matrix is a consistency matrix

Supplementary Figure 8: The indicator layer judgment matrix of the US user satisfaction evaluation indicator system

Supplementary Table 1: China Clinical Pipelines and Public Claims Score

Manufacturer	Clinical Trials		Regulatory Filings	Clinical Pipelines Score	Public Claims			Public Claims Score	App Store Rating
	US	China	China		Clinical Claims	Economic Claims	Engagement Claims		
Guangzhou Dunsanli Network Technology Co., Ltd.	0	0	0	0	0	0	0	0	5
Jiaxing Eleven Technology Co., Ltd	0	0	0	0	0	0	0	0	2.6
Breeze Social B.V.	0	0	0	0	0	0	0	0	4.8
Sansi China Commercial and Trading Co., Ltd	0	0	0	0	0	0	0	0	4.6
Shenzhen Jinqi Technology Co., Ltd.	0	0	0	0	0	0	0	0	4.5
Andrejs Fomcenko	0	0	0	0	0	0	0	0	4.8
Shanghai Ailian Technology Co., Ltd.	0	0	0	0	0	0	0	0	4.9
Beijing Zhenchuang Interconnect Information Technology Co., Ltd.	0	0	0	0	0	0	0	0	5
EUIHYUNG JUNG	0	0	0	0	0	0	0	0	5
Nanjing Fanghe Network Technology Co., Ltd.	0	0	0	0	0	0	0	0	2
Mosaic S.r.l.	0	0	0	0	0	0	0	0	4.3
Anonyme.io	0	0	0	0	0	0	0	0	4.8
Ugur Dogan	0	0	0	0	0	0	0	0	4.5
Shenzhen Poplab Technology Co. Ltd.	0	0	0	0	0	0	0	0	4.1
Shen Feifan	0	0	0	0	0	0	0	0	4.8
Shenzhen Anchong Technology Co., Ltd.	0	0	0	0	0	0	0	0	3.2
The Changsha Yixiaohu Network Technology Co.Ltd.	0	0	0	0	0	0	0	0	4.9
Beijing Xinghe Time Information Technology Co.,Ltd.	0	0	0	0	0	0	0	0	4.8
Beijing Blue Whale and Sea Technology Co., Ltd.	0	0	0	0	0	0	0	0	11.4
Beijing Lituo Feiyuan Technology Co., Ltd.	0	0	0	0	0	0	0	0	3.8
Beijing Light For You Technology Co., Ltd.	0	0	0	0	0	0	0	0	4.4
ANTI Studio	0	0	0	0	0	0	0	0	3.8
Shanghai Qiguan Information Technology Co., Ltd.	0	0	0	0	0	0	0	0	4.1
Beijing Xingshengji	0	0	0	0	0	0	0	0	4.5

Manufacturer	Clinical Trials		Regulatory Filings	Clinical Pipelines Score	Public Claims			Public Claims Score	App Store Rating
	US	China	China		Clinical Claims	Economic Claims	Engagement Claims		
Network Technology Co., Ltd.									
Shanghai Fenxing Network Technology Co., Ltd.	0	0	0	0	0	0	0	0	0
Infinite Feel Co., Ltd.	0	0	0	0	0	0	0	0	4.8
Renxin Network and Technology Co., Ltd	0	0	0	0	0	0	0	0	4.9
Zhengzhou Shenwu Network Technology Co., Ltd.	0	0	0	0	0	0	0	0	4.6
Kousuke Wakayama	0	0	0	0	0	0	0	0	4.9
Tianjin Lingdong Life Culture Communication Co., Ltd.	0	0	0	0	0	0	0	0	2.7
Tianjin Apollo Magic Technology Co., Ltd.	0	0	0	0	0	0	0	0	5
Guangzhou Spark Online Computer Technology Co., Ltd.	0	0	0	0	0	0	0	0	5
Changsha Geili Information Technology Co., Ltd.	0	0	0	0	0	0	0	0	4.8
Guangzhou Guānxīn Clinic Co., Ltd.	0	0	0	0	0	0	0	0	4.2
AiMind Technology Co., Ltd.	0	0	0	0	0	0	0	0	3.9
Beijing Good Mood Internet hospital Co Ltd	0	0	0	0	0	0	0	0	4.3
Puyang Hexin Culture Media Co., Ltd.	0	0	0	0	0	0	0	0	4.4
Chengdu Yijiarui Technology Co., Ltd.	0	0	0	0	0	0	0	0	3.2
Shanghai Huicheng	0	0	0	0	1	0	0	1	1.3
Beijing Zhujian Technology Co., Ltd.	0	0	0	0	0	0	0	0	4.7
FishFun	0	0	0	0	0	0	0	0	4.8
Peter Wieben	0	0	0	0	0	0	0	0	4.9
Yuehong Han	0	0	0	0	0	0	0	0	4.8
Zheng'an (Beijing) Technology Co., Ltd.	0	0	0	0	0	0	0	0	4.5
Beijing Jingshi Zhuxin Education Technology Group Co., Ltd.	0	0	0	0	0	0	0	0	1.4
Guangzhou Renxin Network Technology Co., Ltd	0	0	0	0	0	0	0	0	3

Manufacturer	Clinical Trials		Regulatory Filings	Clinical Pipelines Score	Public Claims			Public Claims Score	App Store Rating
	US	China	China		Clinical Claims	Economic Claims	Engagement Claims		
Beijing Weibianma Network Technology Co., Ltd.	0	0	0	0	0	0	0	0	3.4
Heyou Co., Ltd.	0	0	0	0	0	0	0	0	5
Beijing Happy Test Information Technology Co., Ltd.	0	0	0	0	0	0	0	0	3.1
Shanghai Letao Psychological Counseling Center	0	0	0	0	0	0	0	0	5
Zhejiang Lianxin Technology Co., Ltd.	0	0	0	0	0	0	0	0	0
Hangzhou Lingxi Zhixin Technology Co., Ltd.	0	0	0	0	0	0	0	0	4.9
Mindera Technology (Guangzhou) Company Limited	0	0	0	0	0	0	0	0	4.9
Beijing Source Vision Technology Co., Ltd.	0	0	0	0	0	0	0	0	4.9
Guangzhou Shanshanfang Network Technology Co., Ltd.	0	0	0	0	0	0	0	0	1
Beijing Seal Treasure Technology Co., Ltd.	0	0	0	0	0	0	0	0	4.9
Soulcare Limited	0	0	0	0	0	0	0	0	5
Wuhan Yiqitiaodong Technology Co., Ltd.	0	0	0	0	0	0	0	0	4.8
Guangzhou Wanwuyouyi Technology Co., Ltd.	0	0	0	0	0	0	0	0	4
Guangzhou Shuyang Technology Co., Ltd.	0	0	0	0	0	0	0	0	4.5
Fang Yuan Zhu	0	0	0	0	0	0	0	0	4.8
Cheng Feng Hu	0	0	0	0	0	0	0	0	4.7
Shanghai Qiuzhi WonderLab Technology Co., Ltd.	0	0	0	0	0	0	0	0	3.7
Tianjin Nankai District Chuxiangwei Artificial Intelligence Technology Co., Ltd.	0	0	0	0	0	0	0	0	3.4
Shandong Daguocheng Information Technology Co., Ltd.	0	0	0	0	0	0	0	0	3.9
Chen Zhengui	0	0	0	0	0	0	0	0	4.7
BeiJing Xingfuniao Technology Co.,Ltd.	0	0	0	0	0	0	0	0	4.6
Beijing Qingban	0	0	0	0	0	0	0	0	4.6

Manufacturer	Clinical Trials		Regulatory Filings	Clinical Pipelines Score	Public Claims			Public Claims Score	App Store Rating
	US	China	China		Clinical Claims	Economic Claims	Engagement Claims		
Technology Co., Ltd.									
Yuanlan Xie	0	0	0	0	0	0	0	0	4.6
Tao Zhao	0	0	0	0	0	0	0	0	4.6
Hangzhou LingShi Technology Co., Ltd.	0	0	0	0	0	0	0	0	4.2
Beijing Huirunfeng Technology Development Co., Ltd.	0	0	0	0	0	0	0	0	3.3
Sichuan Qiweng Network Technology Co., Ltd.	0	0	0	0	0	0	0	0	4
Tsingtao TikTok Information Technology Company Limited	0	0	0	0	0	0	0	0	0
Shandong Qiu Wen Education Advisory Co., Ltd.	0	0	0	0	0	0	0	0	4.3
Hangzhou GuiGui Technology Co., Ltd.	0	0	0	0	0	0	0	0	4.5
Yongkang Zhang	0	0	0	0	0	0	0	0	4.2
Henan Ali Interactive Entertainment Network Technology Co., Ltd.	0	0	0	0	0	0	0	0	3.5
Beijing Shuxin Health Technology Co., Ltd.	0	0	0	0	0	0	0	0	5
Mihai Ghiserel	0	0	0	0	0	0	0	0	4.8
Guangzhou Xindao Network Technology Co., Ltd.	0	0	0	0	0	0	0	0	4.8
Guangzhou Zhiyue Network Technology Co., Ltd.	0	0	0	0	0	0	0	0	3.3
Nanjing Aquinas Mental Health Co., Ltd.	0	0	0	0	0	0	0	0	1.1
Chengdu ZyDeke Network Technology Co., Ltd.	0	0	0	0	0	0	0	0	4.3
Guangxi Guomai Information Consulting Co., Ltd.	0	0	0	0	0	0	0	0	2.9
Nanning Tianliao Internet Technology Co., Ltd.	0	0	0	0	0	0	0	0	4.1
Hangzhou Fishsound Technology Co., Ltd.	0	0	0	0	0	0	0	0	4.9
Harbin Cheng'an Information Technology Co., Ltd.	0	0	0	0	0	0	0	0	3.6
Shanghai Polestar	0	0	0	0	0	0	0	0	2

Manufacturer	Clinical Trials		Regulatory Filings	Clinical Pipelines Score	Public Claims			Public Claims Score	App Store Rating
	US	China	China		Clinical Claims	Economic Claims	Engagement Claims		
Software Co., Ltd									
Beijing Wujian Empathy Technology Co., Ltd.	0	0	0	0	0	0	0	0	4.6
Shenzhen Everything Has Wings Psychological Consulting Co., Ltd.	0	0	0	0	0	0	0	0	4.8
Beijing Longxin Enterprise Management Co., Ltd.	0	0	0	0	0	0	0	0	5
Hangzhou Zhongwei Electronics Co., Ltd.	0	0	0	0	0	0	0	0	3.1
Beijing DaXiang ZhiKu Technology Co., Ltd.	0	0	0	0	0	0	0	0	3.7
Shanghai SOULMATE Education Information Technology Co., Ltd.	0	0	0	0	0	0	0	0	2
Heartide Inc.	0	0	0	0	0	0	0	0	4.5
Beijing Xinjie Space Management Consulting Co., Ltd.	0	0	0	0	0	0	0	0	0
Beijing Xinjing Qili Technology Co., Ltd.	0	0	0	0	0	0	0	0	5
Anhui yangguangxinjian technology development co., LTD	0	0	0	0	0	0	0	0	1.8
Yang Yang Zhao	0	0	0	0	0	0	0	0	4.9
Shanghai Qizhenyun Network Technology Co., Ltd.	0	0	0	0	0	0	0	0	4.6
Sichuan Lanyun Psychological Counseling Service Co., Ltd.	0	0	0	0	0	0	0	0	4.3
Shanghai Xueduoduo Education Technology Co., Ltd.	0	0	0	0	0	0	0	0	2
Shanghai Daihu Information Technology Co., Ltd.	0	0	0	0	0	0	0	0	4.9
Shanghai Zhen Lue	0	0	0	0	0	0	0	0	5
Guangzhou Oxygen Baby Education Consulting Service Co., Ltd.	0	0	0	0	0	0	0	0	4.2
Taizhou Liulu Technology Co., Ltd.	0	0	0	0	0	0	0	0	3.5
Han Fei Shu	0	0	0	0	0	0	0	0	4.8
University of Chinese Academy of Sciences	0	0	0	0	0	0	0	0	1

Manufacturer	Clinical Trials		Regulatory Filings	Clinical Pipelines Score	Public Claims			Public Claims Score	App Store Rating
	US	China	China		Clinical Claims	Economic Claims	Engagement Claims		
TOPAPP TECH CO.,LTD	0	0	0	0	0	0	0	0	4.9
Guangxi Wudiantong Technology Co., Ltd.	0	0	0	0	0	0	0	0	4.5
Hai Xing Geng	0	0	0	0	0	0	0	0	5
Amritaayur Health Management Service Co.,Ltd.	0	0	0	0	0	0	0	0	4.2
Guangzhou Zidong Computer Technology Co., Ltd.	0	0	0	0	0	0	0	0	4
Yata (Beijing) Technology co., Ltd	0	0	0	0	0	0	0	0	4.8
Changsha Meipian Technology Co., Ltd.	0	0	0	0	0	0	0	0	4.8
Shanghai Daihu Information Technology Co., Ltd.	0	0	0	0	0	0	0	0	4.9
Xiaozhan Ltd	0	0	0	0	0	0	0	0	4.9
Shanghai Michuruo Network Technology Co., Ltd.	0	0	0	0	0	0	0	0	1
Inquiry Health LLC	0	0	0	0	0	0	0	0	1.3
Wuhan Shengmi Information Technology Co., Ltd.	0	0	0	0	0	0	0	0	1.8
Shanghai Qiu Tinghe Network Technology Co., Ltd.	0	0	0	0	0	0	0	0	1.8
Li Annan	0	0	0	0	0	0	0	0	4.6
Hainan Hengzhi Internet Life Service Platform Co., Ltd.	0	0	0	0	0	0	0	0	4.8
Tangshan Firefly Home Services Co., Ltd.	0	0	0	0	0	0	0	0	4.8
Beijing Baijun Tiancheng Technology Co., Ltd.	0	0	0	0	0	0	0	0	4.9
Chongqing Suqiao Technology Co., Ltd.	0	0	0	0	0	0	0	0	0
Xinjian Intelligence Technology Co.,Ltd.	0	0	0	0	0	0	0	0	4.8
KnowYourself and Exploration	0	0	0	0	0	0	0	0	4.1
Linyi Chuangjing Network Technology Co., Ltd.	0	0	0	0	0	0	0	0	2.6
Spark AI	0	0	0	0	0	0	0	0	4.6
Suzhou Fubian Medical	0	0	0	0	0	0	0	0	4

Manufacturer	Clinical Trials		Regulatory Filings	Clinical Pipelines Score	Public Claims			Public Claims Score	App Store Rating
	US	China	China		Clinical Claims	Economic Claims	Engagement Claims		
Technology Co., Ltd.									
Xinqing Clinic (Guangzhou) Co., Ltd.	0	0	0	0	0	0	0	0	3.3
FireflyHangzhouEnterpriseConsultingServiceCo.,LTD	0	0	0	0	0	0	0	0	4
Hunan Qiufen Network Technology Co., Ltd	0	0	0	0	0	0	0	0	3.5
Beijing Zhihui Psychological Counseling Co., Ltd.	0	0	0	0	0	0	0	0	2.2

Supplementary Table 2: US Clinical Pipelines and Public Claims Score

Manufacturer	Clinical Trials	Regulatory Filings			Clinical Pipelines Score	Public Claims			Public Claims Score	App Store Rating
	Clinical Trials.gov	De novo	PM A	510(k)		Clinical Claims	Economic Claims	Engagement Claims		
7 Cups of Tea	0	0	0	0	0	0	0	2	2	4.4
AbleTo, Inc.	0	0	0	0	0	3	1	1	5	4.7
Cyberlimbic Systems Ltd	0	0	0	0	0	0	0	0	0	5
InnerHour	0	0	0	0	0	0	0	3	3	4
Baris Sarer	0	0	0	0	0	1	0	3	4	4.7
29k International AB	0	0	0	0	0	0	1	2	3	4.4
Thiago K De Angelis	0	0	0	0	0	0	0	0	0	4.6
Being Cares, Inc.	0	0	0	0	0	0	0	0	0	3.9
BeMe Health	0	0	0	0	0	4	0	1	5	4
BetterHelp	0	0	0	0	0	1	2	3	6	4.8
BetterMe Limited	0	0	0	0	0	2	0	1	3	4.5
Mind Monsters Games	0	0	0	0	0	0	0	0	0	4.9
Mental-health , self-care Apps	0	0	0	0	0	0	0	0	0	4.3
Brightside Health Inc	0	0	0	0	0	0	1	3	4	4.3
Calm.com	8	0	0	0	8	0	0	3	3	4.4
Stem4	0	0	0	0	0	0	0	1	1	4.3
Valerii Nikitin	0	0	0	0	0	0	0	0	0	3.7
MENTAL FUTURE OOD	0	0	0	0	0	1	0	3	4	4
Cerebral Inc.	0	1	0	0	1	3	0	0	3	4.6
Cingulo	0	0	0	0	0	1	0	1	2	4.4
Mindset Health	0	0	0	0	0	2	3	2	7	4.4
TheFabulous	0	0	0	0	0	0	0	0	0	4.4
Mindance GmbH	0	0	0	0	0	0	0	1	1	4.7
Clearful Journal, Mindfulness Diary and Mental Health Inc.	0	0	0	0	0	0	0	1	1	4.8
BoltQ Media	0	0	0	0	0	0	0	0	0	4.6
BMD Publishing	0	0	0	0	0	0	0	0	0	4.8

Manufacturer	Clinical Trials	Regulatory Filings			Clinical Pipeline Score	Public Claims			Public Claims Score	App Store Rating
	Clinical Trials.gov	De novo	PM A	510(k)		Clinical Claims	Economic Claims	Engagement Claims		
Relaxio s.r.o.	0	0	0	0	0	0	0	0	0	4.8
Sarafan Technology Inc.	0	0	0	0	0	0	0	0	0	4.7
Finch Care Public Benefit Corporation	0	0	0	0	0	0	0	0	0	5
FitMind LLC	0	0	0	0	0	0	0	0	0	4.7
HAPDAY	0	0	0	0	0	0	0	1	1	4.8
HAPPYMIN D LABS LTD	0	0	0	0	0	0	0	0	0	4.8
Wired Betterment	0	0	0	0	0	0	0	0	0	4.8
Headspace Inc.	0	0	0	0	0	4	0	1	5	4.8
Ginger.io, Inc.	5	0	0	0	5	0	0	0	0	2.6
Healthy Minds Innovations, Inc	0	0	0	0	0	3	0	0	3	4.9
Hims and Hers	0	0	0	0	0	0	2	0	2	4.6
Hiwell Teknoloji Anonim Sirketi	0	0	0	0	0	0	0	0	0	4.5
The How We Feel Project, Inc.	0	0	0	0	0	0	0	0	0	4.9
Humans Anonymous, Inc	0	0	0	0	0	0	0	0	0	4.5
Monkey Taps	0	0	0	0	0	0	0	0	0	4.8
GMRD Apps Limited	0	0	0	0	0	0	0	0	0	4.7
Innerworld	0	0	0	0	0	0	0	0	0	4.1
The Intellect Company	0	0	0	0	0	0	0	0	0	4.7
Iona Mind - Mental Health Support	0	0	0	0	0	3	1	0	4	4.8
Protection and Security App LLC	0	0	0	0	0	0	0	0	0	4.6
Lucero Speaks LLC	0	0	0	0	0	0	0	0	0	4.5
LyraHealth	0	0	0	0	0	0	0	0	0	4.8

Manufacturer	Clinical Trials	Regulatory Filings			Clinical Pipeline Score	Public Claims			Public Claims Score	App Store Rating
	Clinical Trials.gov	De novo	PM A	510(k)		Clinical Claims	Economic Claims	Engagement Claims		
Inc										
Broftware House Yazilim Tasarim Anonim Sirketi	0	0	0	0	0	0	0	0	0	4.8
MARCo Technologies Limited Liability Company	0	0	0	1	1	0	0	0	0	5
Mind Diagnostics, Inc.	0	0	0	0	0	0	0	0	0	4.1
Filin Solutions Fze	0	0	0	0	0	0	0	0	0	3.8
Meru Health	5	0	0	0	5	3	0	0	3	4.7
Mettle App	0	0	0	0	0	0	0	0	0	4.4
Shubhangi Dave	0	0	0	0	0	0	0	0	0	4.2
Mindberg	0	0	0	0	0	0	0	0	0	4.5
MindDoc Health	0	0	0	0	0	1	0	0	1	4.7
Jaedye Labs	0	0	0	0	0	0	0	0	0	4
US Department of Veterans Affairs (VA)	584	0	0	4	588	0	0	0	0	4.8
Daniil Sugonyaev	0	0	0	0	0	0	0	0	0	4.7
MindPeers	0	0	0	0	0	0	0	0	0	3.6
Creators Collective Inc.	0	0	0	0	0	0	0	1	1	4.7
247 Labs Inc.	0	0	0	0	0	0	0	0	0	4.2
Greator GmbH	0	0	0	0	0	0	0	0	0	4.7
Mindspa Health	0	0	0	0	0	0	0	0	0	4
Mindset Technologies Ltd	0	0	0	0	0	0	0	0	0	5
MindTales	0	0	0	0	0	0	0	0	0	4.3
Yasen App	0	0	0	0	0	0	0	0	0	5
tap tap times	0	0	0	0	0	0	0	0	0	4.2
Modern Health, Inc.	0	0	0	0	0	0	0	0	0	4.7
Gismart Limited	0	0	0	0	0	0	0	0	0	4.3

Manufacturer	Clinical Trials	Regulatory Filings			Clinical Pipeline Score	Public Claims			Public Claims Score	App Store Rating
	Clinical Trials.gov	De novo	PM A	510(k)		Clinical Claims	Economic Claims	Engagement Claims		
Solitude Colors	0	0	0	0	0	0	0	0	0	4.4
Roble Ridge Software LLC	0	0	0	0	0	0	0	0	0	4.7
Vijay Sharma	0	0	0	0	0	0	0	0	0	4.8
Mosaic S.r.l.	0	0	0	0	0	0	0	0	0	4.7
Inquiry Health LLC	0	0	0	0	0	0	0	0	0	4.1
Monkey Taps LLC	0	0	0	0	0	0	0	3	3	4.8
My Dear LLC	0	0	0	0	0	0	0	3	3	4.5
BetterApp Tech Co., Limited	0	0	0	0	0	0	0	0	0	4.8
My Possible Self Ltd	0	0	0	0	0	0	0	0	0	4.7
Myselfland	0	0	0	0	0	0	0	0	0	5
Switch on Your Brain International LLC	0	0	0	0	0	0	0	0	0	4.8
N OCD INC	2	0	0	0	2	1	0	0	1	4.7
Ggtude Ltd	0	0	0	0	0	1	0	0	1	4.7
Mind Ease Labs Ltd	0	0	0	0	0	0	0	0	0	4.2
Interesting Tests Apps	0	0	0	0	0	0	0	0	0	4
Reflective Technologies ApS	0	0	0	0	0	0	0	0	0	4.6
At team LLC	0	0	0	0	0	0	0	0	0	4.8
Remente	0	0	0	0	0	0	0	0	0	4.8
Luka, Inc	0	0	0	0	0	0	0	0	0	4.5
Simply Rooted Media	0	0	0	0	0	0	0	0	0	4.6
My True Value	0	0	0	0	0	0	0	0	0	3.8
Silk and Sonder Inc	0	0	0	0	0	1	1	0	2	4.9
Sintelly	0	0	0	0	0	0	0	0	0	4.6
Smiling Mind	0	0	0	0	0	1	1	0	2	4.8
Kooth Group Limited	0	0	0	0	0	0	0	0	0	4.1
Positive Rewards	0	0	0	0	0	0	0	0	0	2.4
BOGDAN NATAKHIN	0	0	0	0	0	0	0	0	0	4.8
ActiveAce	0	0	0	0	0	0	0	0	0	4.5
SuperBetter,	0	0	0	0	0	0	0	0	0	4.7

Manufacturer	Clinical Trials	Regulatory Filings			Clinical Pipelines Score	Public Claims			Public Claims Score	App Store Rating
	Clinical Trials.gov	De novo	PM A	510(k)		Clinical Claims	Economic Claims	Engagement Claims		
LLC										
Talkspace	5	0	0	0	5	0	0	0	0	4.7
Groop Internet Platform inc.	0	0	0	0	0	0	0	0	0	4.8
Cameron Nazemi	0	0	0	0	0	0	0	0	0	4.8
GoZen!	0	0	0	0	0	0	0	0	0	4.5
Tellmi	0	0	0	0	0	0	0	0	0	3.9
The Tapping Solution, LLC	0	0	0	0	0	2	0	2	4	4.8
Thera Inc.	0	0	0	0	0	0	0	0	0	4.7
Woo Development s LLC	0	0	0	0	0	0	0	0	0	4.9
unstuck Mental Health Studios, Inc.	0	0	0	0	0	0	0	0	0	4.8
Practico	0	0	0	0	0	0	0	0	0	4.7
Goodvyzn LLP	0	0	0	0	0	0	0	0	0	4.7
Voidpet	0	0	0	0	0	0	0	0	0	4.9
VOS.health	0	0	0	0	0	0	0	0	0	4.8
Wave Life, Inc.	0	0	0	0	0	0	0	0	0	4.3
Appify App	0	0	0	0	0	0	0	0	0	4.6
Jackson Tempra	0	0	0	0	0	0	0	0	0	4.4
whiteflagapp	0	0	0	0	0	0	0	0	0	4.3
Wiso LTD.	0	0	0	0	0	1	1	1	3	4.5
Woebot Health Inc	14	0	0	0	14	0	0	0	0	4.6
Touchkin	1	0	0	0	1	0	0	0	0	4.6
Youper, Inc.	0	0	0	0	0	1	0	1	2	0

Supplementary Table 3: Examples of reviews for each topic in Chinese reviews

Topics	Reviews
Topic 1: Mental health assessment	The emotional assessment helped me understand my stress levels, and the relaxation guidance was highly effective in adjusting my mental state.
Topic 2: User service	User support responded quickly and resolved issues promptly. The free trial was excellent, and providing feedback was very convenient.
Topic 3: Online consultation function	Being able to chat with a counselor anytime was invaluable. Their advice for adjusting my mindset was incredibly helpful.
Topic 4: Effectiveness	The emotional regulation feature truly works! The service functions are robust and highly rated.
Topic 5: User feedback	The app is thoughtful, with a cute and well-designed interface—I've already recommended it to friends!
Topic 6: Emotional management function	This function has helped me grow. I find joy daily and feel like I have a warm, safe harbor within.
Topic 7: Interface design	The interface is clean and practical, with simple navigation. Keeping a mood journal is super convenient.
Topic 8: Privacy and security	Login requires a verification code and only allows phone number access, making me feel my information is safer.
Topic 9: Affective state tracking	It tracked my emotions during college entrance exams, supporting me through that stressful high school period.
Topic 10: Emotional motivation function	Receiving warm encouragement voices and energy reminders daily is truly touching—each time brings a little surprise.
Topic 11: Psychological education courses	The psychology courses are professional, and the public lecture content is rich—I've gained a lot of useful knowledge.
Topic 12: Social support	Inviting friends to join in, young people supporting and guiding each other—it feels like having online buddies.
Topic 13: Personalized service	My “Confidant” has a gentle voice and responds quickly; the recommended star-rated courses and articles perfectly match my needs.

Supplementary Table 4: Examples of reviews for each topic in English reviews

Topics	Reviews
Topic 1: Psychological education courses	The courses are professional and practical, with clear content that genuinely supported my learning and growth.
Topic 2: Emotional management function	Helped manage depression and anxiety, overcome inner struggles, and cultivate a positive mindset.
Topic 3: Personalized service	Support and guidance were spot-on, with a customized plan that encouraged my continuous progress.
Topic 4: Stress management function	Effectively alleviates stress and anxiety, helps cope with panic, and promotes physical and mental relaxation.
Topic 5: Online consultation function	Can share concerns anytime online; counselors listen patiently.
Topic 6: Privacy and security	Privacy protection is excellent—especially reassuring regarding the confidentiality of diagnostic data.
Topic 7: Usability	Free download. Occasional lag during use, but overall experience is satisfactory.
Topic 8: Social support	Ability to share daily life via voice calls with friends and family enhances the sense of companionship.
Topic 9: Meditation practice	Meditation aids relaxation and sleep, with guided music enhancing effectiveness.
Topic 10: Cost	Consultation and membership fees are slightly high, but I still consider the value for money.
Topic 11: Interface design	The interface is clean and intuitive, with easy-to-use features that feel natural to navigate.
Topic 12: User feedback	Sincere thanks—I've learned acceptance and respect, and my heart is filled with gratitude.
Topic 13: User service	The counselors provide excellent service with quick responses, though occasional loading delays occur.

Supplementary Table 5: Prompt input for theme naming and description

Step	Prompt	Input Data
Topic Naming	You are a psychology expert conducting a study on user satisfaction with a mental health app. After applying LDA to cluster online user reviews, 13 relevant topics were generated, each with 30 primary keywords. Please name each of these 13 topics, keeping each name within 6 characters.	30 Primary Keywords for Each Topic
Topic Description	Please interpret the 13 named topics. Summarize each topic in one sentence using plain language that accurately captures its core meaning.	13 Topic Names and Their Corresponding 30 Primary Keywords
Topic Classification	Please categorize the 13 topics based on their commonalities into 3-6 broad categories. Name each category and provide an explanation.	13 Topic Names and Their Corresponding 30 Primary Keywords

Supplementary Table 6: Manual verification of topic naming in large language models

Serial number	Indicator information		Score					Expert scoring	
	Evaluation index	Meaning explanation	1	2	3	4	5	Expert 1	Expert 2
1	Name accuracy	The topic name can fully cover the core keywords of the topic	Completely disagree	Disagree	Neutral	Agree	Completely agree	5	5
		The topic name can precisely summarize the core semantics of the topic	Completely disagree	Disagree	Neutral	Agree	Completely agree	4	4
2	Describe interpretability	The theme description is clear and easy to understand	Completely disagree	Disagree	Neutral	Agree	Completely agree	5	5
		There is no ambiguity in the topic description	Completely disagree	Disagree	Neutral	Agree	Completely agree	4	5
3	Rationality of classification	The parent theme can reflect the common characteristics of the child themes	Completely disagree	Disagree	Neutral	Agree	Completely agree	5	5
		The name of the parent topic can encompass the core semantics of all the child topics	Completely disagree	Disagree	Neutral	Agree	Completely agree	5	5

Expert evaluation consistency = Number of consistent/Total number of items = 5/6 = 83.3%

Expert 1 recognition = Self-assessment score/Total evaluation score = 28/30 = 93.3%

Expert 2 recognition = Self-assessment score/Total evaluation score = 29/30 = 96.3%

Supplementary Table 7: Multicollinearity analysis for model 1^a (China)

Influencing factor	Tolerance	VIF
Topic 1: Mental health assessment	0.95	1.05
Topic 2: User service	0.94	1.05
Topic 3: Online consultation function	0.97	1.03
Topic 4: Effectiveness	0.97	1.03
Topic 5: User feedback	0.96	1.03
Topic 6: Emotional management function	0.98	1.01
Topic 7: Interface design	0.93	1.06
Topic 8: Privacy and security	0.97	1.03
Topic 9: Affective state tracking	0.98	1.01
Topic 10: Emotional motivation function	0.96	1.03
Topic 11: Psychological education courses	0.99	1.01
Topic 12: Social support	0.98	1.01
Topic 13: Personalized service	0.96	1.04
Dependent variable: positive rating deviations		

Supplementary Table 8: Multicollinearity analysis for model 2^b (China)

Influencing factor	Tolerance	VIF
Topic 1: Mental health assessment	0.95	1.05
Topic 2: User service	0.94	1.05
Topic 3: Online consultation function	0.97	1.03
Topic 4: Effectiveness	0.97	1.03
Topic 5: User feedback	0.96	1.03
Topic 6: Emotional management function	0.98	1.01
Topic 7: Interface design	0.93	1.06
Topic 8: Privacy and security	0.97	1.03
Topic 9: Affective state tracking	0.98	1.01
Topic 10: Emotional motivation function	0.96	1.03
Topic 11: Psychological education courses	0.99	1.01
Topic 12: Social support	0.98	1.01
Topic 13: Personalized service	0.96	1.04
Dependent variable: negative rating deviations		

Supplementary Table 9: Multicollinearity analysis for model 1^a (US)

Influencing factor	Tolerance	VIF
Topic 1: Psychological education courses	0.97	1.03
Topic 2: Emotional management function	0.98	1.01
Topic 3: Personalized service	0.96	1.04
Topic 4: Stress management function	0.98	1.01
Topic 5: Online consultation function	0.97	1.02
Topic 6: Privacy and security	0.99	1.01
Topic 7: Usability	0.97	1.03
Topic 8: Social support	0.96	1.04
Topic 9: Meditation practice	0.99	1.01
Topic 10: Cost	0.96	1.04
Topic 11: Interface design	0.96	1.03
Topic 12: User feedback	0.98	1.02
Topic 13: User service	0.99	1.01
Dependent variable: positive rating deviations		

Supplementary Table 10: Multicollinearity analysis for model 2^b (US)

Influencing factor	Tolerance	VIF
Topic 1: Psychological education courses	0.97	1.03
Topic 2: Emotional management function	0.98	1.01
Topic 3: Personalized service	0.96	1.04
Topic 4: Stress management function	0.98	1.01
Topic 5: Online consultation function	0.97	1.02
Topic 6: Privacy and security	0.99	1.01
Topic 7: Usability	0.97	1.03
Topic 8: Social support	0.96	1.04
Topic 9: Meditation practice	0.99	1.01
Topic 10: Cost	0.96	1.04
Topic 11: Interface design	0.96	1.03
Topic 12: User feedback	0.98	1.02
Topic 13: User service	0.99	1.01
Dependent variable: negative rating deviations		

**Supplementary Table 11: China APPs attribute discrimination index of factors influencing
user satisfaction**

Influencing factor	Positive Significance	Negative Significance	Positive Direction	Negative Direction	Coefficient Difference	Number Tendency
Topic 1: Mental health assessment	1	0	-1	1	1	1
Topic 2: User service	1	0	1	-1	1	1
Topic 3: Online consultation function	1	1	1	-1	1	1
Topic 4: Effectiveness	1	1	-1	1	1	1
Topic 5: User feedback	1	1	-1	1	1	1
Topic 6: Emotional management function	1	1	1	-1	1	1
Topic 7: Interface design	1	1	1	-1	1	1
Topic 8: Privacy and security	0	1	1	-1	1	1
Topic 9: Affective state tracking	0	1	-1	1	1	1
Topic 10: Emotional motivation function	1	1	1	-1	1	1
Topic 11: Psychological education courses	1	1	1	-1	1	1
Topic 12: Social support	1	1	1	-1	1	1
Topic 13: Personalized service	1	1	-1	1	1	1

Supplementary Table 12: US APPs attribute discrimination index of factors influencing user satisfaction

Influencing factor	Positive Significance	Negative Significance	Positive Direction	Negative Direction	Coefficient Difference	Number Tendency
Topic 1: Psychological education courses	1	1	-1	1	1	1
Topic 2: Emotional management function	1	1	1	-1	1	1
Topic 3: Personalized service	1	1	-1	1	1	1
Topic 4: Stress management function	1	1	1	-1	1	1
Topic 5: Online consultation function	1	0	1	-1	0	1
Topic 6: Privacy and security	1	0	-1	1	1	1
Topic 7: Usability	1	1	-1	1	1	1
Topic 8: Social support	1	1	-1	1	1	1
Topic 9: Meditation practice	1	1	1	-1	1	1
Topic 10: Cost	1	1	-1	1	1	1
Topic 11: Interface design	1	0	-1	1	0	1
Topic 12: User feedback	1	1	1	-1	1	1
Topic 13: User service	1	1	-1	1	1	1

Supplementary Table 13: The proportion of user reviews corresponding to the theme of the influencing factors of user satisfaction in China and the US

Country	Theme categories	Theme (influencing factors)	Keywords (Chinese/English)	Number of reviews (%)
China	Psychological Services Functions	Mental health assessment	Psychological counseling, professional, counselor, confiding, guidance, emotional	40,184(33.82%)
		Online consultation function	Counseling, Advice, Psychological, Online, Adjustment, Chat	16,462(13.85%)
		Emotional management function	Growth, Happiness, Gains, Emotions, Inner Self, Warmth	5,250(4.42%)
		Affective state tracking	Stages, Expectations, College Entrance Exam, Getting Through, High School, Time	1,793(1.51%)
		Emotional motivation function	Daily, Energy, Encouragement, Surprise, Touching, Voice	3,615(3.04%)
	Effectiveness	Effectiveness	Results, Evaluation, Regulation, Functionality, Service, Overall	5,518(4.64%)
		User feedback	Gratitude, Thoughtful, Dedicated, Lovable, Highly Recommended, Anticipation	1,559(1.31%)
	Usability	Interface design	Practical, Software, Interface, Simple, Logging, Streamlined	13,817(11.63%)
		User service	Customer Support, Free, Download, Trial, Design, Feedback	20,565(17.31%)
	Personalized Services	Personalized service	Voice, Close Friends, Feedback, Courses, Star Ratings, Articles	1,948(1.64%)
		Psychological education courses	Courses, Learning, Participation, Lectures, Promotion, Public Welfare	964(0.81%)
	Social Support Network	Social support	Introduction, Young People, Psychologists, Work, Companionship, Guidance	618(0.52%)
	Data Management	Privacy and security	Login, Mobile, Information, Verification Code, Phone Number, Unique	6,535(5.50%)
US	Psychological Service Functions	Online consultation function	Talk, listen, share, vent, relationship, consistent	17,416(5.04%)
		Emotional management function	depression, anxiety, struggle, overcome, suffer, positive	31,001(8.97%)
		Stress	anxiety, stress, panic, cope, disorder,	21,357(

Country	Theme categories	Theme (influencing factors)	Keywords (Chinese/English)	Number of reviews (%)
		management function	relief	6.18%)
		Meditation practice	meditate, relax, asleep, music, practice, affirmation	45,308(13.11%)
	Effectiveness	User feedback	grateful, calm, respect, accept, gratitude, compassion	7,035(2.04%)
		Cost	pay, session, therapy, cost, service, price, premium	17,046(4.93%)
	Usability	Usability	download, minute, trouble, issue, free, version	32,599(9.43%)
		Interface design	interface, design, feature, access, comfortable, convenient	27,187(7.86%)
		User service	counselor, psychologist, message, team, service, load	27,664(8.00%)
	Personalized Service	Personalized service	guide, support, choose, program, develop, encourage	9,044(2.62%)
		Psychological education courses	Learn, improve, solution, growth, progress, reason	51,636(14.94%)
	Social Support	Social support	friend, family, daily, voice, share, activity	25,178(7.28%)
	Data Management	Privacy and security	private, complaint, notification, track, diagnose, true	33,181(9.60%)

**Supplementary Table 14: Frequency Distribution of User Satisfaction Evaluation Indicators
in China and the US**

National	Guideline Level	Indicator Level	Indicator Frequency Share
China	Psychological Service Functions (56.64%)	Mental health assessment	33.82%
		Online consultation function	13.85%
		Emotional management function	4.42%
		Affective state tracking	1.51%
		Emotional motivation function	3.04%
	Effectiveness(5.95%)	Effectiveness	4.64%
		User feedback	1.31%
	Usability (28.94%)	Interface design	11.63%
		User services	17.31%
	Personalized Service (2.45%)	Personalized service	1.64%
		Psychological education courses	0.81%
	Social Support Network (0.52%)	Social support	0.52%
	Data Management (5.50%)	Privacy and security	5.50%
US	Psychological Services Function (33.30%)	Online consultation function	5.04%
		Emotional management function	8.97%
		Stress management function	6.18%
		Meditation practice	13.11%
	Effectiveness (6.97%)	User feedback	2.04%
		Cost	4.93%
	Usability (25.29%)	Usability	9.43%
		Interface design	7.86%
		User service	8.00%
	Personalized Services (17.56%)	Personalized service	2.62%
		Psychological education courses	14.94%
	Social Support Network (7.28%)	Social support	7.28%
	Data Management (9.60%)	Privacy and security	9.60%

Supplementary Table 15: Importance Scale of Customer Satisfaction Evaluation Indicator

Systems for Chinese and US Users

Importance Level	Scale Value	China Index Frequency Difference	US Index Frequency Difference
Equally Important	1	[0.00%, 6.24%]	[0.00%, 3.47%]
Slightly Important	3	(12.48%, 18.72%)	(6.94%, 10.41%)
Relatively Important	5	(24.96%, 31.20%)	(13.88%, 17.35%)
Highly Important	7	(37.44%, 43.68%)	(20.82%, 24.29%)
Absolutely important	9	(49.92%, +∞)	(27.76%, +∞)
Other	2, 4, 6, 8	Difference in proportion between different importance levels	Difference in proportion between different importance levels

Supplementary Table 16: Comprehensive Weighting of the Chinese User Satisfaction

Evaluation Index System

Objective Layer	Criterion Layer	Criterion Layer Weight	Indicator Layer	Indicator Layer Weight	Comprehensive Weight
User Satisfaction	Psychological Service Function	57.88%	Mental health assessment	54.50%	31.54%
			Online consultation function	17.40%	10.07%
			Emotional management function	9.50%	5.50%
			Affective state tracking	9.10%	5.27%
			Emotional motivation function	9.50%	5.50%
	Effectiveness	5.38%	Effectiveness	50.00%	2.69%
			User feedback	50.00%	2.69%
	Usability	20.92%	Interface design	50.00%	10.46%
			User services	50.00%	10.46%
	Personalized Service	5.21%	Personalized service	50.00%	2.61%
			Psychological education courses	50.00%	2.61%
	Social Support Network	5.21%	Social support	100.00%	5.21%
	Data Management	5.38%	Privacy and security	100.00%	5.38%

Supplementary Table 17: Combination consistency test and overall consistency test of the

Chinese user satisfaction evaluation indicator system

	Judgment Matrix Hierarchy	Weight	CI	RI	CR (N)	CR*
Criterion Layer	Objective Layer-Criterion Layer	1	0.02	1.24	0.0166<0.1	0.0166<0.1
Indicator Layer	Psychological Service Function-Indicator Layer	0.5788	0	1.12	0<0.1	
	Software Effectiveness-Indicator Layer	0.0538	0	0		
	Software Usability - Indicator Layer	0.2092	0	0		
	Personalized Services - Indicator Layer	0.0521	0	0		
	Social Features - Indicator Layer	0.0521	0	0		
	Privacy and Security - Indicator Layer	0.0538	0	0		

Supplementary Table 18: Comprehensive Weighting of the US User Satisfaction Evaluation

Index System

User Satisfaction	Criterion Layer Weight	Criterion Layer	Indicator Layer	Indicator Layer Weight	Comprehensive Weight
User Satisfaction	Psychological Service Function	47.84%	Online consultation function	14.84%	7.09%
			Emotional management function	23.12%	11.06%
			Stress management function	19.45%	9.30%
			Meditation practice	42.58%	20.37%
	Effectiveness	4.45%	User feedback	50.00%	2.22%
			Cost	50.00%	2.22%
	Usability	25.69%	Usability	33.33%	8.56%
			Interface design	33.33%	8.56%
			User service	33.33%	8.56%
	Personalized Services	12.51%	Personalized service	20.00%	2.50%
			Psychological education courses	80.00%	10.00%
	Social Support Network	4.62%	Social support	100.00%	4.62%
	Data Management	4.89%	Privacy and security	100.00%	4.89%

Supplementary Table 19: Combination consistency test and overall consistency test of the

US user satisfaction evaluation indicator system

	Judgment Matrix Hierarchy	Weight	CI	RI	CR (N)	CR*
Criterion Layer	Objective Layer-Criterion Layer	1	0.030	1.24	0.0242<0.1	0.0242<0.1
Indicator Layer	Psychological Service Function - Indicator Layer	0.4784	0	0.89	0<0.1	
	Software Effectiveness - Indicator Layer	0.0445	0	0		
	Software Usability - Indicator Layer	0.2569	0	0.52		
	Personalized Services - Indicator Layer	0.1251	0	0		
	Social Features - Indicator Layer	0.0462	0	0		
	Privacy and Security - Indicator Layer	0.0489	0	0		

Supplementary Table 20: Search terms and results for Chinese and English App stores

App stores	Search terms	Search results
Chinese App Store		
China Apple App Store	“Psychology (心理),” “psychological health (心理健康),” “psychological hygiene (心理卫生),” “psychological health service(s) (心理健康服务),” “mental (精神),” “mental health (精神健康),” “mental hygiene (精神卫生),” “mental health service(s) (精神卫生服务),” “depression (抑郁),” and “anxiety (焦虑)”	1269
Huawei App Store	“Psychology (心理),” “psychological health (心理健康),” “psychological hygiene (心理卫生),” “psychological health service(s) (心理健康服务),” “mental (精神),” “mental health (精神健康),” “mental hygiene (精神卫生),” “mental health service(s) (精神卫生服务),” “depression (抑郁),” and “anxiety (焦虑)”	1673
Xiaomi App Store	“Psychology (心理),” “psychological health (心理健康),” “psychological hygiene (心理卫生),” “psychological health service(s) (心理健康服务),” “mental (精神),” “mental health (精神健康),” “mental hygiene (精神卫生),” “mental health service(s) (精神卫生服务),” “depression (抑郁),” and “anxiety (焦虑)”	125
VIVO App store	“Psychology (心理),” “psychological health (心理健康),” “psychological hygiene (心理卫生),” “psychological health service(s) (心理健康服务),” “mental (精神),” “mental health (精神健康),” “mental hygiene (精神卫生),” “mental health service(s) (精神卫生服务),” “depression (抑郁),” and “anxiety (焦虑)”	967
360 App store	“Psychology (心理),” “psychological health (心理健康),” “psychological hygiene (心理卫生),” “psychological health service(s) (心理健康服务),” “mental (精神),” “mental health (精神健康),” “mental hygiene (精神卫生),” “mental health service(s) (精神卫生服务),” “depression (抑郁),” and “anxiety (焦虑)”	564
Application treasure App store	“Psychology (心理),” “psychological health (心理健康),” “psychological hygiene (心理卫生),” “psychological health service(s) (心理健康服务),” “mental (精神),” “mental health (精	445

	神健康),” “mental hygiene (精神卫生),” “mental health service(s) (精神卫生服务),” “depression (抑郁),” and “anxiety (焦虑)”	
English App Store		
US Apple App Store	“mental health”	238
US Google Play Store	“mental health”	249

Supplementary Table 21: Detailed inclusion and exclusion criteria for mental health Apps

Inclusion/exclusion criteria	Standard content
Inclusion criterion 1 (IC1)	The search terms were “Psychology (心理),” “psychological health (心理健康),” “psychological hygiene (心理卫生),” “psychological health service(s) (心理卫生服务),” “mental (精神),” “mental health (精神健康),” “mental hygiene(精神卫生),” “mental health service(s) (精神卫生服务),” “depression (抑郁),” and “anxiety (焦虑)” for the Chinese App Store, and “mental health” for the English App Store.
Inclusion criterion 2 (IC2)	For individual psychological health consumers.
Inclusion criterion 3 (IC3)	Not intended for use by psychological health professionals or companies.
Inclusion criterion 4 (IC4)	Available in Chinese or English, or offers Chinese/English versions.
Exclusion criterion 1 (EC1)	Single-purpose functionality without comprehensive psychological health services.
Exclusion criterion 2 (EC2)	Requires institutional verification (e.g., corporate, school) for access.
Exclusion criterion 3 (EC3)	Removed from app stores or lacks user reviews.

Supplementary Note 1: Analysis of Wald Test Results

To investigate the asymmetry in the effects of various factors on user satisfaction and dissatisfaction, we conducted Wald tests to compare the absolute values of the coefficients in Models 1 and 2 for China and the US, respectively. The absolute values of the effect coefficients for the 13 influencing factors in China exhibit significant differences in their effects on both positive and negative rating biases. Specifically, the online consultation function, effectiveness, user feedback, emotional management function, interface design, emotional motivation function, psychological education courses, social support, and personalized service exerted a significant positive influence on positive rating bias and a significant negative influence on negative rating bias. Moreover, the absolute values of their effect coefficients differed significantly across the two models. Mental health assessment, effectiveness, user feedback, affective state tracking, and personalized service exerted a significant negative effect on positive rating bias and a significant positive effect on negative rating bias, with the absolute values of their effect coefficients differing significantly across the two models. That is, all influencing factors exhibited a significant asymmetric impact on Chinese users' satisfaction.

Among the 13 influencing factors in the US, all except online consultation function and interface design exhibit statistically significant differences in the absolute values of their effect coefficients for both positive and negative rating biases. Specifically, emotional management function, stress management function, meditation practice, and user feedback exert a significant positive influence on positive rating bias and a significant negative influence on negative rating bias, with their absolute effect coefficients differing significantly between the two models. Conversely, psychological education courses, personalized service, usability, social support, cost, and user service show a significant negative influence on positive rating bias and a significant positive influence on negative rating bias. Moreover, the absolute values of their effect coefficients differ significantly across the two models.

Supplementary Note 2: Analysis of Kano Model Results

Based on the Kano model, the 13 factors influencing user satisfaction with Chinese MHAs can be further categorized into 11 charm factors and 2 essential factors. Mental health assessment and user services significantly influence positive rating bias but have no significant effect on negative rating bias ($PS=1$, $NS=0$), making them charm factors affecting user satisfaction. Additionally, online consultation function, effectiveness, user feedback, emotional management function, interface design, emotional motivation function, psychological education courses, social support, and personalized service also function as charm factors influencing user satisfaction. These factors significantly influence both positive and negative rating biases, with significant differences in the absolute values of bias coefficients. Moreover, positive reviews outnumber negative ones ($PS=1$, $NS=1$, $CD=1$, $NT=1$), confirming their status as charm factors. Privacy security and affective state tracking are essential factors affecting user satisfaction. These factors significantly influence negative rating bias but have no significant effect on positive-negative rating bias ($PS=0$, $NS=1$), thus qualifying as essential factors.

Supplementary Note 3: Analysis of AHP Results

In prior research, the authors identified 13 key factors influencing user satisfaction with mental health applications (MHAs) in China: mental health assessment, user service, online consultation function, effectiveness, user feedback, emotional management function, interface design, privacy and security, affective state tracking, emotional motivation function, psychological education courses, social support, and personalized service. For the US market, the study identified 13 significant influencing factors: psychological education courses, emotional management function, personalized service, stress management function, online consultation function, privacy and security, usability, social support, meditation practice, cost, interface design, user feedback, and user service. Based on these key factors, this study constructs a user satisfaction evaluation framework for both markets.

The study results indicate that psychological service functions ranked first in both countries' evaluation systems (56.64% in China, 33.30% in the US), while software usability standards followed closely with proportions of 28.94% and 25.29%, respectively.

The study presents a comparative analysis of the Chinese and American user satisfaction evaluation indicator systems under a 1-9 level importance measurement scale: The unit importance measurement scale for the Chinese indicator system is 6.24%. This implies that for every 6.24% increase in the frequency difference between an indicator and others, its importance measurement scale increases by one level. while the Chinese indicator system's unit importance measurement scale is 3.47%, equivalent to a one-level increase in importance measurement scale for every 3.47% increase in this value.

When calculating the indicator weights in the Chinese user satisfaction evaluation index system, hierarchical single ordering and consistency testing are first performed. Based on the importance scale of this system, a criterion-layer judgment matrix is constructed. The importance weights of each criterion are calculated through hierarchical single-sorting, and the consistency of the results is verified. The standardized principal eigenvector of the criterion-level judgment matrix is [0.5788, 0.0538, 0.2092, 0.0521, 0.0521, 0.0538], with a consistency ratio (CR) value of 0.0166, indicating that the consistency test has been successfully completed. Subsequently, judgment matrices were constructed for each indicator under the six criteria. The importance weights of each indicator were calculated using hierarchical single-sorting, and the consistency of the results was verified, as shown in Supplementary Figure 5. Specifically, the normalized maximum eigenvector of the psychological service function judgment matrix was [0.545, 0.174, 0.095, 0.091, 0.095], the validity judgment matrix was [0.5, 0.5], the usability judgment matrix was [0.5, 0.5], the personalized service judgment matrix was [0.5, 0.5], the social support judgment matrix was [1], and the privacy security judgment matrix was [1]. All matrices were consistent matrices. Subsequently, hierarchical total ranking and consistency testing were performed. Based on the importance weights at the criterion and indicator levels, the comprehensive weight of each indicator in user satisfaction was calculated using the linear weighted sum method, followed by combination consistency testing and overall consistency testing. Among them, mental health assessment (31.54%), interface design (10.46%), and user

service (10.46%) are the three indicators with the highest comprehensive weights in the Chinese user satisfaction evaluation system. Additionally, the composite consistency coefficients and overall consistency coefficients at all levels are below 0.1, indicating that the consistency tests have been validated.

When constructing the indicator weighting for the U.S. user satisfaction evaluation system, hierarchical single-ranking and consistency testing were first performed. Based on the importance scale of this system, a judgment matrix was constructed for the criterion level. The importance weights of each criterion were calculated through hierarchical single-ranking, and the consistency of the results was verified. The standard maximum eigenvector of the criterion-level judgment matrix was [0.4784, 0.0445, 0.2569, 0.1251, 0.0462, 0.0489], with a consistency ratio (CR) value of 0.0224, indicating successful consistency verification. Subsequently, judgment matrices were constructed for each indicator under the six criteria. The importance weights of each indicator were calculated using hierarchical single-sorting, and the consistency of the results was verified (as shown in Supplementary Figure 7). Specifically: The standard maximum eigenvector for the psychological service function judgment matrix is [0.1484, 0.2312, 0.1945, 0.4258] - The standard maximum eigenvector for the effectiveness judgment matrix is [0.5, 0.5] - The standard maximum eigenvector for the usability judgment matrix is [0.3333, 0.3333, 0.3333] - The standard maximum eigenvector for the personalized service evaluation matrix is [0.2, 0.8], while both the social support and privacy security evaluation matrices have a standard maximum eigenvector of [1]. All matrices satisfy consistency requirements. Hierarchical total ranking and consistency testing were subsequently conducted. Based on the importance weights of the criterion layer and indicator layer, the comprehensive weight of each indicator on user satisfaction was calculated using the linear weighted sum method. Combination consistency testing and overall consistency testing were then performed. Among them, meditation practice (20.37%), emotion management function (11.06%), and psychological education courses (10.00%) ranked as the top three comprehensive weighted indicators in the U.S. user satisfaction evaluation system. Additionally, the composite consistency coefficients and overall consistency coefficients at all levels were below 0.1, indicating that the consistency tests were passed.

This study constructed a user satisfaction evaluation framework applicable to both China and the US based on 13 factors significantly influencing user satisfaction in both countries. By analyzing the proportion of various influencing factors in user reviews from both countries, we employed the Analytic Hierarchy Process (AHP) to calculate the weights of each indicator within the respective satisfaction frameworks. In the Chinese evaluation framework, the top three indicators by composite weight are mental health assessment (33.82%), user service (17.31%), and online consultation function (13.85%). In the U.S. USEIS framework, the top three indicators are psychological education courses (14.94%), meditation practice (13.11%), and privacy and security (9.6%).

This study used the proportion of positive evaluations corresponding to each indicator as the initial satisfaction value. Based on the importance weights from two USEIS (User Satisfaction Indicator Systems), it assessed the overall satisfaction and specific satisfaction levels for each criterion among US and Chinese users. Chinese users demonstrated relatively high overall satisfaction with mental health apps, with an assessment value of 0.8896 (out of 1). At the

criterion level, user satisfaction was relatively high for software usability (0.9220) and privacy security (0.9101), while satisfaction was lower for software effectiveness (0.8166) and personalized service (0.7699). At the indicator level, users expressed relatively high satisfaction with emotional management (0.9607) and emotional motivation function (0.9475), while satisfaction was lower for personalized service (0.6325) and affective state tracking (0.7817). Among all charm factors, users expressed highest satisfaction with emotional management (0.9607) and lowest satisfaction with personalized service (0.6325). Among all essential factors, users showed highest satisfaction with privacy security (0.9101) and lowest satisfaction with affective state tracking (0.7817).

In comparison, U.S. users also reported relatively high overall satisfaction with mental health apps, though slightly lower than Chinese users (0.8731 vs. 0.8896). At the guideline level, users expressed relatively high satisfaction with psychological service functions (0.9053) and social support networks (0.8641), while satisfaction was lower for software usability (0.8308) and personalized services (0.8515). At the indicator level, users reported relatively high satisfaction with emotional management function (0.9339), meditation practice (0.9105), user feedback (0.9049), while satisfaction with user service (0.7894), personalized support (0.8009), and cost (0.8074) was lower. Among all appeal factors, users reported highest satisfaction with emotional management function (0.9339) and lowest satisfaction with personalized support (0.8009).