**Methodological Appendix for “Wailing Wall or Tree Hole? An AI Exploration of Mourning Behaviors for the Deceased on Chinese Social Media - Taking Li Wenliang as an Example”,** YU Minghao,JIANG Zhuohao,ZHAI Yongqing,HE Yuchen,FANG Ying,SONG Yihui, Department of Communication, HONG KONG Baptist University

# Appendix I

## Introduction of Selected Case

1. Li Wenliang (October 12,1986 – February 7,2020), an ophthalmologist at Wuhan Central Hospital. On December 30,2019, Li Wenliang forwarded the picture of the diagnosis letter to his WeChat group and reminded his relatives and friends to pay attention to take precautions and was "admonished". He has been described as the "whistle blower" of the COVID-19 epidemic. He was diagnosed with COVID-19 on February 1, his condition deteriorated from February 6 to 7, and he died after rescue. His death caused great public grief, mourning and sympathy.
2. Luo Xishu (1996-October 13, 2020), male, Weibo name “红烧土豆叶”. He was a postgraduate student in the Chemical Engineering Department of Dalian University of Technology. Due to the long-term setbacks of the subject experiment, his graduation would be delayed. At 2 am on October 13, 2020, he posted a suicide note of about 2,000 characters on Weibo. Then, he hanged himself in the chemical laboratory building of the Western Campus of Dalian University of Technology. After his death, the suicide notes quickly spread on Weibo.
3. Zhou Peng(December 4, 1996 - November 28, 2021), male ,Weibo name “鹿道森”, He was an independent photographer. At 23:28 on November 28, 2021, he disappeared after posting a suicide note on Weibo. On December 1, his corpse was found on the reef in Putuo District, Zhoushan City, Zhejiang Province. Police confirmed that he died by suicide.
4. Unknown, Weibo name “离灯\_冬眠mode关闭失败’’, female ,born in the 90s. She couldn't bear her parents’ excessive desire to control and escaped from life in the game world. When the game world was regretted by her parents, she chose to leave this world.
5. Ma Jie (January 16, 1990 - March 17, 2012), female, Weibo name “走饭”. She was a college student in Nanjing. She suffered from severe depression for a long time before her death, and “醒醒我们回家了” was her alternative account. On March 17, 2012, she hanged herself in the dormitory of Nanjing Jinling Institute of Science and Technology.
6. A Chu, Weibo name “头发有点儿杵脖子”, female,26 years old. She graduated from college four years ago and suffered from depression for two years. She arrived at Mount Emei on September 29, took the ropeway up the mountain at 3 p.m. At 19:33 that day, she lost contact after leaving a suicide note on Weibo. To date, her whereabouts are unknown.
7. Unknown, Weibo name “旅行的孤独风”, male. He suffered from depression for many years and suffered from long-term sleep disorders. On December 13, 2018, he posted a farewell blog on Weibo, saying, "When you see this Weibo, I have already left. I survived 1584 days and finally ended this morning." Afterwards, the police confirmed his death: he had chosen a very decisive way to leave.
8. Daidai, Weibo name “玫瑰机关枪”, female. She was an ACG painter. She committed suicide in November 2020. Two months after she fell in love with her 33-year-old boyfriend, she was hit by repeated verbal humiliation, which led her to a desperate path and hanged herself in her newly purchased and house.
9. Xinxin, Weibo name “十里清禾w” , female. She was a senior student in Shanghai. She did well in her studies and has good relationships with her classmates. But her teacher's evidence-free accusations and criticisms had caused a huge psychological shadow and shock to her psyche. she left a suicide note and chose to drown eventually.
10. Liu Xuezhou, Weibo name “刘学州a”. He suffered from chronic depression and was a trafficked child. He was bullied at school when his adoptive parents died at an early age. When he grew up, he found his biological parents and was subjected to cyber-violence because of slander by his biological parents. Eventually, he couldn't bear all the malice. He left a suicide note on Weibo and committed suicide in Sanya.

10. Zheng Linghua(1999 - January 23, 2023 ),Weibo name “鸡蛋姬”. She shared a photo of herself and her 84-year-old grandfather on social media platforms for her success as a graduate student, but it was stolen and maliciously spread by people with ulterior motives. They created rumors that she had a morally questionable relationship with her grandfather. These rumors caused her great distress, and she was diagnosed with depression. It was later confirmed by friends that she died on January 23, 2023.

# Appendix II

## Data Collection

All our data was collected from the largest social media in Mainland China, Weibo, which has public web pages for desktop platforms to provide HTML content that can be collected through universal web scraper tools. Regarding our own usage, we utilized Python and its network crawler library, Request, as our web crawler tool. All our collected data rows contain the following contents shown in Table A.

**Table A**

*Specific classification criteria for Wailing Wall and Tree Hole*

|  |
| --- |
| Columns |
| ID, comment time, number of likes for each comment, location shown by IP address, username, user feature ID, user display gender, number of users followed by the commentator, number of users following the commentator, and user comment text |

Regarding our main research subject, the comment section of the final Weibo post by Li Wenliang, we collected all comment data that were available between February 7th, 2020, 00:31 and April 23rd, 2023, 23:43. After removing all empty lines, duplicate and invalid data (including webpage links, error codes, etc.), a total of 1,338,083 valid records were collected.

Regarding our control group, which consists of Weibo comment sections from 11 related users, we started collecting all available comment data from their last Weibo post comment section from April 29th, 2023, 13:16 and moved backward in time. The collected data dimensions are the same as mentioned above, and the oldest comment data can be traced back to August 23rd, 2016, 11:34. After removing all empty lines, duplicate and invalid data (including webpage links, error codes, etc.), a total of 3,193 valid records were collected and identified separately by account name.

It is important to note that our data collection process was subject to interference from algorithmic selection bias, which is a common issue in global communication research of Internet. Specifically, there were periods of time during which comments data were completely uncrawlable, one of the is that the comments in Li Wenliang's comment section between October 2nd and October 25th, 2022, as well as some of the control group comments. These missing comments were caused by algorithmic interference of data presentation, potentially due to platform-initiated data cleaning, selective presentation (such as the automatic usage of "selected comments" function on Weibo), and relevant legal regulations. Nevertheless, the data collected still exhibits sufficient representativeness in terms of text content, and certain steps were already taken to mitigate the impact of this issue in subsequent exploratory processes.

# Appendix III

## Manual Labeling

To accurately reflect the temporal and distribution features of the comments in our dataset, we first divided the dataset into 39 months and then subdivided each month into five layers based on the number of words in each comment, from most to least, resulting in a total of 195 layers. From each layer, we randomly selected 0.4% of the data, and extracted the month as the temporal feature. After removing duplicates and invalid text, the resulting dataset consisted of 6,024 rows of data.

We manually labeled each comment as "Yes" (1), "No" (0), or "Not Related", based on our established classification criteria, as shown in Table B. During the manual labeling process, we also extracted certain distinctive words for model’s better classification performance and exported as codebook with manual labeling, as shown in Table C.

**Table B**

*Realistic Example of Table for Manual Labeling*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Comments | Time Pattern | Wailing Wall | Tree Hole | Not Related |
| 今天早点过来看李医生。安好！ | 2020-12 | 1 | 1 | 0 |

**Table C**

*Table for codebooks*

|  |  |  |
| --- | --- | --- |
| Wailing Wall | Tree Hole | Not Related |
| 天堂,李医生,你,您,英雄,致敬,谢谢,感谢,文亮,亮哥,李哥,一路走好,安好,RIP,谢谢您,🙏🏻,🙏,抢救,永远记得,铭记,小白菊,安息,李老师,烈士,在那边,💐,蠟燭,吹哨人,走好,生日快乐,还好吗,老李,恭喜,不会忘记,永垂不朽,好久不见,文亮老哥,庆余年2,祈祷,恭喜,再见,您家人,R.I.P,加油,调查,迟到的正义,李大夫,遗忘,怀念,训诫书,天使,放心,先生,千古,庆余年,奇迹,永远,青年,公道,没有忘记,平安回来,辟谣,🕯️,勇敢的人,你的家人,您的家人,保重,想到你,好久没来,回来,安,李醫師,师兄,看看你,表彰,祝好,2.6,李sir,伟大,亮亮,平行世界,悼念,记得你,表彰,当爸爸,等你,活过来,辛苦了,学长,李兄,永垂不朽,等你,民族英雄,敬礼,缅怀, | 烦,今天,自己,天气,明天,今年,压力,难,为什么,担心,我要,昨天,疯,失眠,每天,迷茫,毕业,分手,考试,怎么办,下雨,考研,回家,开学,一天,喜欢,妈妈,最近,事情,高考,变好,焦虑,异地,科目二,科目三,爸爸,上岸,考研,结婚,爱,冷,心情,吵架,吃,怕,通过,工作,上班,下班,我,失业,好看,未来,高数,难过,累,生活,恋爱,核酸,口罩,上岸,工作,压力,复试,男朋友,失败,她,他,不想,无聊,焦虑,认真,幸福,努力,想,关系,日子,世界,昨晚,今晚,婚姻,周一,生气,倒霉,大学生,忙,加班,小区,姐姐,奶奶,家里,痛苦,手术,折磨,外婆,我家,前途,网课,学期,秘密,糟糕,备考,准备,不开心,这两天,烦恼,人生,好运,期末,朋友,哭,生病,解封,下雪,困惑,好累,分享,唠嗑,车祸,论文,保佑,备考,作业,崩溃 | nan,图片评论,图片评论网页链接,。,看看,1,截图留个爪 |

*Note.* During our testing, we found that the presence of certain emoji characters in some special words did not affect the classification accuracy of BERT, at least not for this task.

# Appendix IV

## Disactivated Words for Chinese Words Segmentation

**Table D**

*Disactivated Words for Chinese Words Segmentation*

|  |
| --- |
| Disactivated Words |
| ，,。,、,！,？,；,了,的,[,],（,）,《,》,是,啊,吧,呢,哦,嗯,呀,嘛,噢,哈,咯,吗,嘻,嘿,哇,咦,咚,咔,咕,咔,个,了,这,那,也,就,还,都,和,不,从,到,在,会,要,有,又,但,None,~,～,没,已,来,去,天,却,看,很,啰,嘛,如,：,之,吧,+,太,话,呀,给,让,着,可,已,啦,能,跟 |

# Appendix V

## Events and Representative Comments of time peaks

**Table E**

*Possible events and user representative comments on time peaks(Comments Sampled)*

|  |  |  |  |
| --- | --- | --- | --- |
| Category | Time | Event | Representative Comments |
| **Directly related to Li Wenliang** | | | |
|  | 2020.2.7 | Death day | 一路走好，李医生，您将永垂不朽！ |
| 2020.3.19 | Revoke reprimand | 终于等到了结果，训诫书撤销了，你安心在天堂继续治病救人吧，我们永远牵挂你。 |
| 2020.6.12 | Second child born | 李医生，你的第二个孩子出生啦，是个大胖小子呢！恭喜你啦 |
| 2020.8.13 | Anti-epidemic honor award & "Tree Hole" attracts attention | 刷新闻看到李医生这里成了树洞，挺心酸的看到大家的故事，希望所有善良的人都好运 健康 快乐 平安~ |
| 2020.9.8 | Anti-epidemic Commendation Conference | 今天表彰 我也代表我自己来表彰你 |
| 2020.10.13 | Birthday | 李文亮医生，生日快乐，你永远是我们的英雄 |
| 2020.12.30 | "Whistling" Anniversary | 今天特地开看你，纪念您吹哨一周年，因为记忆太深刻，所以我无法选择遗忘，也忘不掉。一年了疫情再我国和世界依然没有结束。希望能早日结束这场疫情，因为所有人都很难！ |
| 2021.2.6 | 1st Anniversary of Death | 李医生 您走了一年 我没有忘记您 还有很多人没有忘记您 |
| 2022.2.6 | 2nd Anniversary of Death | 李医生，一转眼你离开两周年了。因为你的传奇与勇气，世上许多孤单的人可以在你身边获得连结，而不只是绝望。 |
| **Festival** | | | |
|  | 2021.4.4 | Qing Ming Festival | 清明时节，第一个想到了您。李医生，愿您在另一个世界健康快乐 |
| 2021.10.1 | National Day | 李医生国庆节快乐呀 今天是建国72周年 有时间记得一会去看天安门升国旗呀 一定有许多跟你一样的英雄灵魂和你一起同看的 |
| 2022.1.1 | New Year | 李医生，2022年了，愿你的家人阖家安康，顺遂无恙！ |
| 2022.4.5 | Qing Ming Festival | 李大夫，今天清明节，来看看你。感谢你。 |
| 2022.12.31 | New Year's Eve | 李医生！疫情终于成了历史！新年新篇章！再见2022，让我们迎接新年2023吧！李医生，爱你 |
| **Related to epidemic** | | | |
|  | 2022.12.8 | Unblocking of the three-year epidemic | 三年了，今天基本是放开了，谢谢那时的你，保全了我们！新的这个轮回，你应该也是个做了很多次核酸的可爱宝宝了吧 |
| 2022.9.19 | Guizhou epidemic-related transfer vehicle overturned | 李医生 你遇到这27个人的时候 他们没有变阳 他们在隔离的路上 |
| **Related to media** | | | |
|  | 2021.11.24 | Popular TikTok video "He spoke for the common people" & Weibo’s Trending #The third winter of the epidemic# | 李医生，今天又在小红书上看到有人提起你啦 真好 被很多人都记得 |
| 2022.7.12 | Weibo’s Trending #People doing lots of exercises from small town should not be ridiculed# | 李医生，今天看见微博好多热搜，心里突然有点难受，但是生活还是得向前看的，道路曲折我们仍要前行，加油吧！疫情终会结束的，我们的生活一定会回到正轨的 |

*Note.* These peaks were detected by find peaks function of Python library *signal*. Prominence=800, Distance=15, Height=2500.

# Appendix VI

## Disactivated Words for Chinese Words Segmentation

**Table F**

*Distinctive keywords for Wailing Wall and Tree Hole (Comparison Group)*

|  |  |  |
| --- | --- | --- |
| Account Name | Distinctive words of Wailing Wall | Distinctive words of Tree Hole |
| 红烧土豆叶 | 猫咪，下辈子，同学，昔书，温柔，活着，离开，坚持，愿 | 学生，导师，大学，论文，读研，科研，毕业 |
| 鹿道森 | 作品，照顾，道森，杭州，舟山，弟弟，玫瑰，摄影，拍，小鹿 | 因为，而 |
| 离灯\_冬眠mode关闭失败 | 姐妹，方式 | 结婚，报警，工作，父母，孩子，人生，生命，灯，朋友 |
| 醒醒我们回家吧（走饭小号） | 大号，他们 | 死，难过，自杀，朋友，活着，生活，大家，想，希望 |
| 头发有点杵脖子 | 风，漂亮，回来，阿杵，选择，快乐 | 痛苦，抑郁症，自杀，他，生活，自己，爱 |
| 旅行的孤独风 | 北京，火锅，朋友，孤独，美好 | 安慰，坚持，难过，爱，活着，自杀，生活，努力 |
| 玫瑰机关枪 | 玫瑰，姐姐，代代，画画，晚安 |  |
| 十里清禾w | 陪，可爱，下辈子，欣欣，姐姐，老师，妹妹，善良 | 人，努力，人生 |
| 刘学州a | 学州，惩罚，弟弟，州州，三亚，自杀，爱，善良，宝贝 | 新京报，网暴，亲生，找到，生活，刘学州 |
| 鸡蛋姬 | 一路走好，小姐姐，天堂，自由，优秀，粉色，头发，幸福，来世，染 |  |
| 走饭 | 饭饭 | 宝宝，难过，抑郁症，世界，痛苦，现在，朋友，自己 |