Evaluating and recognizing stressful periods and events of urban migrant children from microblog

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Abstract

Increased issues in the health of urban migrant children induced by mental stress have attracted worldwide attention. The stable growth of migrant children, which affects the sustainable stability of the community, is adversely impacted by sustained pressures without adequate assistance and advice. Therefore, psychological stress from each post on microblog has been established through research focused on detecting migrant children. Nevertheless, after stressful times, it is more important to consider stress from aspect to recognize stressful periods and stressful incidents that cause each stressful period. This paper identifies the problem of the recognition of migrant children in the open social network microblog stressful periods and stressor events. Besides, the improved Poisson-dependent probability model has been developed and focused on the study of the postings of migrant children during stressful activities in schools to compare stressors with a set of postings on Tencent Weibo (microblog). Through this model the average stressed times of migrant children which obtains more information regarding potential stressors affecting stressed periods.

Keywords Mental stress · Psychological stress · Microblog · Migrant children

Introduction about Traditional System

Chinese recent rapid economic development has contributed to a large internal flow of capital, energy, and labor from predominant traditional system with a planned economy into a market (Martin et al. 2014). Over the past 30 years, the voluntary migration of farmers from rural China has increased, gradually seeking employment and improved living standards in urban (Hollander et al. 2016) and coastal export processing centers. In 2012, about 250 million migrant workers moved to metropolitan centers with over 20 million offspring (Bandari 2018; Gee et al. 2012).

For starters, Wenzhou, a medium coastal town in south- considered to be the home to around three million migratory families (Twigg and Mosel 2017). These families form the fastest rising metropolitan group, contributing almost one-third of the total population of Wenzhou (Mu and Hu 2016). The impact of migration would eventually change China's educational and job environment over the next decade. Migrant children are now a core tool for the Chinese urban social community. Effective incorporation into urban schools of migrant children is the prerequisite for well-being, financial prosperity, and social stability. However, the dual household registration (hukou) (or rural-urban stratification system) that prevents equitable access to public facilities, including schooling for migrant children (Liu 2013), is among the most compelling structural barriers to integration. There are many drawbacks for students at a traditional migrant school in the residential region of a community – including a shortage of teaching positions (Shakeel and Baskar 2020), outdated infrastructure for schooling and inadequate instructional content and equipment. Migrant children are more likely to live in distress relative to the metropolitan equivalent, undergo psychiatric symptoms such as anxiety and depression, endure discrimination and victimization and report crime (Joshi et al. 2019). Besides economic drawbacks, the acculturation and well-being of migrant children are further constrained by a lack of cultural resources and social isolation in the region (Fig. 1).

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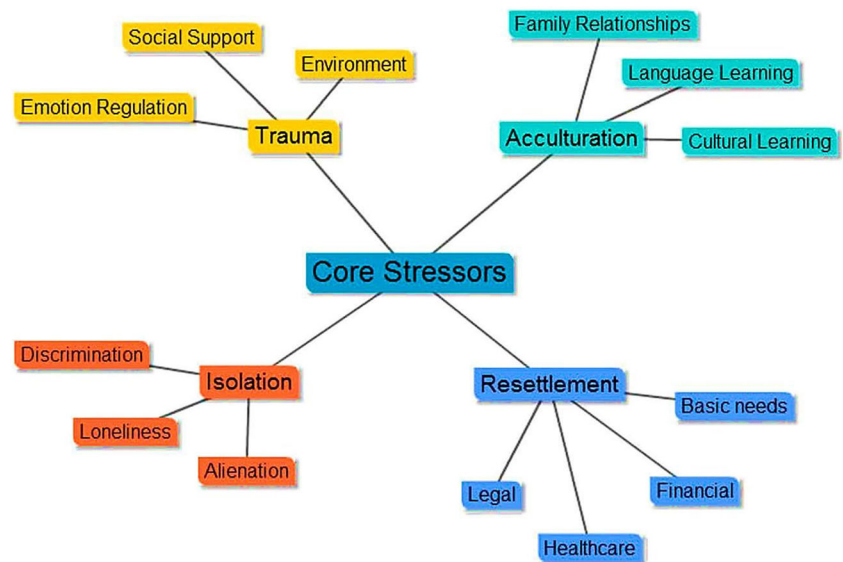jifang@chd.edu.cn

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Fig. 1 General structure of stress analysis

Introduction for Stress Analysis of Migrant Children

Stress is a major health problem which consists of 77% of migrant children recorded daily stress-related physical effects, and an additional 75 to 90% have stress-related visits (An et al. 2018a). The children consistently claimed their stress rates in school which are significantly higher than they assumed and their overall tension rate was much higher than in children. About 37% claimed that they are fatigued from depression (Leggett 2017) and another 23% said they had missed meals for it. Teens recorded a 10-point stress rating of 5.8 relative to 5.1 for adults on average. According to the study, depression tends to intensify among certain children (An et al. 2018b). Then there is no chance that migrant children would become more difficult than most at the speed of culture and with high expectations of adults and themselves (Li et al. 2019).

To this end, this paper advance from emotionally focused level to event-driven level based on the topic of urban migrant children's psychological stress identification (Sudin et al. 2019). By studying the connection between stress incidents in Tencent Weibo postings (http:/t.qq.com), it uncovers the traumatic time for migrant children and obtains further information on traumatic activities that cause stress. Use measures to resolve data uncertainty if the post is missed and if incorrect warnings of abnormal distress are absent which implies stressors over a stressful time which are associated (Chen et al. 2014).

However, it is not a simple task to identify stressful times and microblog stresses. Within the study, it investigates the definition of stressful migrant children's activities that involve daily difficulties and life occurrences which are likely to be encountered by worldwide migrant children within five aspects: student life, home life, peer interactions, intimate relationships, and auto-recognition. As per the knowledge, the literature to examine and classify stressor incidents in children from the micro blog has the chance trend on fish for the association between stress incidents and stressful post-postage activities, together with the event-driven stress identification methodology that has been proposed in this paper, which aims to solve the psychological health issue of children from presence to material.

Literature Survey and Outline about Conventional Methods

Recent researches indicate that racism can affect inequalities in health. As people grow up from early childhood to old age, social systems may generate new vulnerabilities to racial inequalities. Nevertheless, few types of research have taken this theory completely into consideration. They present a structure demonstrating how inequality and health inequalities can be viewed from life (Ye et al. 2016). They relate ideas about aging exposures, cycles about vulnerability, interlinked lives, delay, tension distribution, historical phases, and cohorts. This reflects a general notion that racism will organize its presence in the sense of having a benefit (e.g. education) or in marginalized (e.g. prison) situations. Such period and duration variability may lead to ethnic inequities in life expectancy and other consequences of health throughout lifespan and generations.

Worldwide, millions of children suffer acute medical emergencies. The reaction of children to these incidents goes from temporary distress to severe post-traumatic symptoms of stress disorder (PTSS). Although several models have examples for adult PTSS development and maintenance, relatively few were children. Current child PTSS models are primarily limited to post-trauma, and the crucial peri-trauma period can

be most readily overlooked while the evaluation and prevention activities take place (Marsac et al. 2014). PTSS work for childhood injuries typically explores separation predictors, sometimes ignoring possibly significant experiences. This paper presents a new framework that utilizes the Bio-Psycho-Social System (BPSS) and reflects on emergency care incidents peri trauma processes. Knowing the connections between bio-psycho-social factors during peripheral trauma that inform the early detection of risky children, prevention measures and clinical care. Recommendations for further studies are addressed, including the need for the analysis of PTSS in the sense of many causes.

Throughout their everyday lives, school-age children experience a lot of tension, which can trigger psychological and physical difficulties (White 2012). Stress Management focused on awareness is an adult awareness-centered system of practices successful. This research aimed to evaluate the effectiveness of awareness training with schoolgirls in yoga to reduce the experience of tension, to improve coping skills, self-esteem and self-regulation. Students in grades four and five have been selected and selectively allocated to participation and waitlist monitoring classes from two high schools. The therapy party worked for 1 h a week and completed 10 min of daily assignments for 8 weeks. A better understanding of the feeling correlated with stress may improve the coping ability according to studies of attention training. Even though the growing perception of stressors itself may raise stress as part of the cycle of awareness of cognitive, emotional of social development. It could be necessary to increase stress.

The analysis of potential effects on later behavior and neurobiology of early life stress (ERS) in humans is a fast increasing field. Although epidemiologic and neurobiological research offer a dark image of adverse outcomes the scope of the findings surrounding potential emotional and cognitive deficiencies correlated with ELS has not been incorporated. Emerging results of experimental research exploring brain developmental processes in healthy populations will offer a new basis for the understanding of ELS-based sequels (Pechtel and Pizzagalli 2011). The goal is to increase this analysis based on the effects of clinical research on normative brain growth which are outlined. Second, this control brain structure system was used to explain shifts in the developmental path of ELS cognitive and affective deficits.

Research of immigrant children and displaced migrant communities from (military) foreign tensions showed the emotional health and conduct patterns of the children and the values regulating their organization and recovery (Vostroknutov 2011). Concerning the age (pre-school, school-age and teenage children) and often in connection with actions of the adult, emotional and

behavioral impairments have been identified following mental trauma (acute, sub-acute and long-term periods). The company, in collaboration with numerous medical practitioners (psychiatrists, psychotherapists), counselors and social workers are discussed as follows,

Stressing Events and Posting Behaviors

Stressor Events

This section carry out the user analysis at Taicang High school, main senior research in Zhejiang Province of China, to empirically test the connection between stressors and the abnormal posting behaviors of migrant children. The school periodically posts the weekly schedule on the official website of the school. From 1 January 2012 to 1 February 2015, it has 273 school activities, most of the teaching has been analyzed and it takes out 122 challenging research activities such as interviews, competitions, grades, etc. Table 1 mentions several common events, their duration, the frequency of student performance assessment and the overall frequencies in the observed 3 years. As these activities are regular and graduation, students in the same grade have the same experiences each year as in previous years. Through month on average there will be 2- stressor activities for every student school.

Posting Behaviour

It recognizes 124 students who are Tencent Weibo superiors (registered in Taicang Senior High School before 1 January 2012) that have published more than 100 entries in the microblog. Each student is anonymous, and every post is accessible. A total of 29,232 posts have been written between 1 January 2012 and 1 February 2015. The average number for postal services is 236, a maximum of 1387 and a minimum of 104. In each school, Table 2 displays the number of active students over 3 years, students 'roles and stressor activities. The number of users, communications and stress events involved in user research is provided in Table 2.

If the detection feature applies to each post k of the post, it will sense the stress level of the youth in the community, in the relatives, in friends, in self-relationships and the relationship, indicating stress $stress(k, q) = (k, D, h)$, whereby $D = \{d^1, d^2, \ldots, d^m\}$ which corresponds to stress class community, student-relationships, self-relationships, romantic relations and uncertainties and $l = K = \{0, 1, 2, 3, 4, 5\}$, corresponding to none, fairly light, medium, mild, heavy, high-stress rates. If no term is available for the group, it can add an "unknown" label to the observed stress point.

Table 1 Several stress events related to the study

Events of Stressor	Period (Days)	Effectiveness	Frequency
Opening of School	1	2	7
Last / mid-term examination	3	2	24
Examination (weekly / monthly)	2	1	28
Test result notification	2	3	32
Examination IT	1	2	13
Test of mock	1	2	10
Application for college entry	3	1	6
Examination of college entrance	3	1	5

Stressor and stressful posts relationships have been used to analyze the effect of stressors on the post-report actions of students; it divided the entire observation period into two different collections. Owing to the consistency of the experience of the human person, it has a period of 1 day on all sides of an event stressor. The estimation of Δk relies on the meaning of the event and the length of the event Δk = Sigificance * Duration. In this sample Day is the main time unit. It divides them into one if there is an overlap between two stressor event periods. Instead, for each student will see where the behavior, across four tests, is different across stressor events and non-stressor events (Fig. 2):

$P \# post$: Total number of posts every day over the times between stressors and non-stressors;

$P \# stress\_post$: Average amount of stressful posts average for times of stress and non-stress events (Fig. 3).

$P \# stress\ level$: the average total stress level ratio per day across stressors and non-stressors;

$P \# stress_{proportion}$: the total proportion of stressful posts.

If a predictor value is below 1.0, the difference in stressor and non-stressor occurrence times within this variable is low.

Proposed Methodology

It presents a statistical model of a stressful rate for migrant children based on empirical findings. Based on this finding with the model, it is possible to remove traumatic times and stress events from each stressful time.

A Stressful Time Computational Model for Migrant Children

Poisson Stress Level Process over some Time

It models the teenage posting behavior as two separate and identical cycles during stress and non-stressing activities. A hierarchical Poisson process, with a β_1 post rate for each unit cycle, and the number of stressful objects generated in a non-stressed scenario, is a different, heterogeneous Poisson stressor follows a β_0 post level for each unit duration. From Fig. 3, it finds $\beta_1 > \beta_0$.

In general, the number of stressful posts β posted over some time K (which should not be adjacent) for a Poisson process. In other words, the probability that a migrant child has stressful roles m can be estimated as:

$$R_q \left[M = \frac{m}{\beta} \right] = \frac{e^{-\beta K} (\beta K)^m}{m!} \tag{1}$$
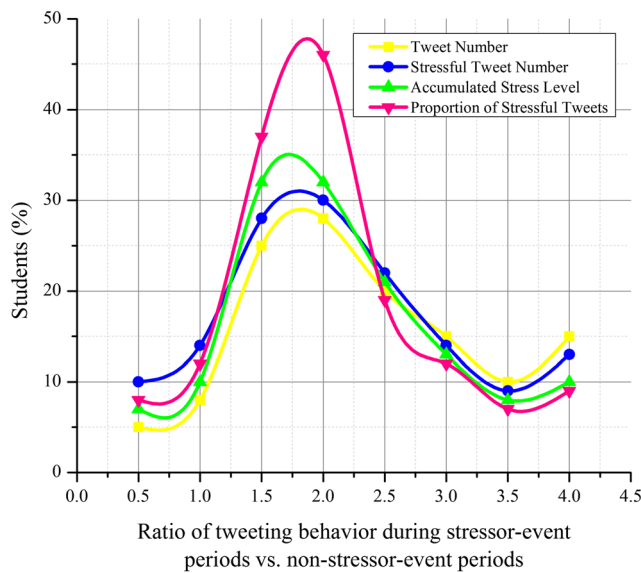
Where $m = 0, 1, 2, \ldots \infty$.

Stressing Periods with Stressful Post Rates

It uses teen historical post details to assess the probability distribution of stressor β_1 *and* β_0 for calculating the expectation of the stressful event. These are our metrics regarding times of stress or uncertainty, i.e. times of stress.

M_0 and M_1 are minimum numbers to measure β_1 *and* β_0 respectively, according to estimation theory. Assume that

Table 2 The number of users, communications and stress events involved in user research

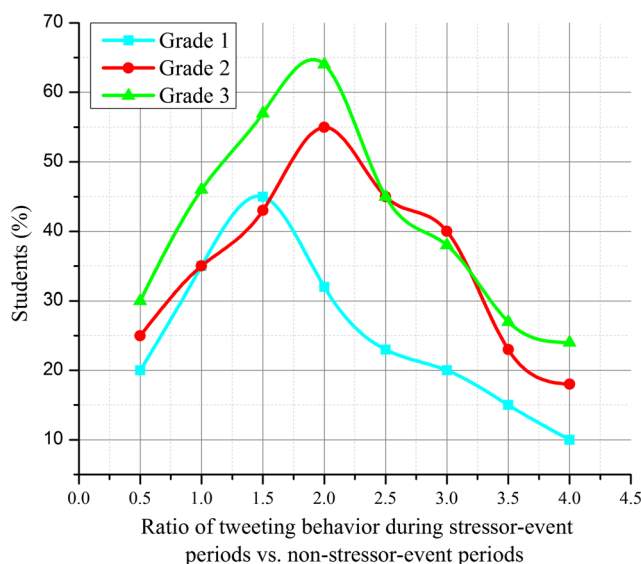| Grades	Number of students involved	Number of post services	Number of Stressor Events
1	95	14,415	40
2	130	11,453	56
3	115	5367	35
Total	–	31,235	131

Fig. 2 $P\#post$, $P\#stress\_post$, $P\#stress\ level$, $P\#stress_{proportion}$ the ratio between stressors and non-stressors

Jeffrey's has not been notified before the stressful β_1 and β_0 posting rate.

For β_1 and $\beta_0 > 0$, the previous density $R(\beta_1\ and\ \beta_0)\ \alpha$ $\frac{1}{\sqrt{\beta_0 - \beta_1}}$ and the corresponding priors $R(\beta_1)\ \alpha\ \frac{1}{\sqrt{\beta_0 - \beta_1}}$ and $R(\beta_0)\ \alpha\ \frac{1}{\sqrt{\beta_0 - \beta_1}}$. The post-distribution of β_j (for $j = 0, 1, 2, \ldots\infty$) is according to the Bayes Rule.

$$R\left(\beta_j \Big| M_j\right) \propto R_p\left[M_j \big| \beta_j\right] r\left(\beta_j\right)$$

$$= \left(\frac{1}{\sqrt{\beta_1, \beta_0}} \times \frac{e^{-\beta_j K_j}(\beta_j K_j)^{M_j}}{M_j!} \times \frac{1}{\sqrt{\beta_j}}\right) \propto \beta_j^{M_j^{-0.5}} \quad (2)$$

Fig. 3 $P\#stress\_post$ Posting histograms for the students in different grades during stressors and non-stressors

It is simplified the posteriors to 1

$$R\left(\beta_j = y \Big| M_j\right) = \begin{cases} \dfrac{K_j(K_j y)^{M_j^{-0.5}} e^{K_j y}}{\gamma(M_j + 0.5)} & if\ y \geq 0 \\ 0 & otherwise \end{cases} \quad (3)$$

It is simplified the posteriors to 1.

It measures the probability that a teen would experience stress as:

$$r\left(\beta_1 > \beta_0 \Big| M_1, M_2\right) = \iint r\left(\beta_1 = y \Big| M_1\right) r\left(\beta_0 = z \Big| M_0\right) dydz \quad (4)$$

When $r(\beta_1 > \beta_0 | M_1, M_2)$ exceeds a level, it assumes that during stressor event periods the traumatic rate of the child is greater than that during times of non-stressor activities. Thus it considers the respective time to be stressful.

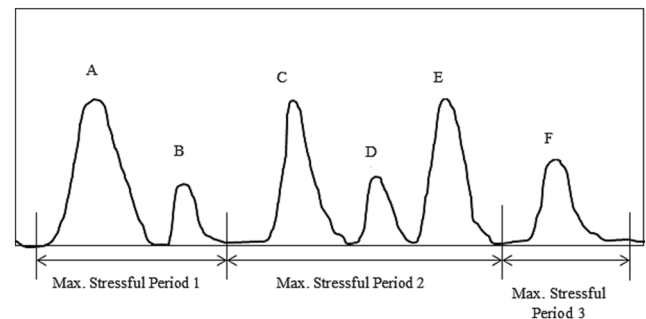## Exploration of Stressful Times for Migrant Children

The model now provides specific description and removal of stressful times.

Stressful time definitions.

Definition 1:

$TSW[K_1, K_z]$ is a wave of stress when at least one traumatic post happens in the increasing period in $[K_1, K_f]$, i.e., all in one direction $\forall_j (1 \leq j \leq f)(mK_j > 0)$ is a great stress mechanism, whether it is the stress mechanism, although the μ1 stress intensity is more likely to surpass a β_0 in traditional non-stress case periods above a trust level $TSW[K_1, K_z]$. If the level of stress is not a high level of stress, it is a low level of stress.

Six big waves A, D, E, F, and two small waves B are shown in Fig. 4. While B, F are not common and are regarded as large waves of stress, late waves of large wave A, or large stress wave D, which can result in the same stress case, can occur. The same stressors can help to create a large stress wave D and E. They combine these semantically-related signals focused on specific stress categories to cope with both irregular and

Fig. 4 Four big waves (**a, d, e, f**), 2 small waves (**b, c**), and three average periods of stress

continuous aspects of migrant children's stress and restore a complete stress period.

Given $TSW(k_1, k_n) = \{(k_1, C_1, s_1) \ldots (k_n, C_n, s_n)\}$, let describe the proportion of stress class $c \in C$ in TSW, over the period (k_1, k_n) as tSW.

$$cRatio\left(tSW\,[k_1, k_n], c\right) = \frac{\left|\left\{C_j \,|\, j \in [1, n] \wedge \left(c \in C_j\right)\right|\right.}{\sum_{j \in (1, n)} |C_j|} \quad (5)$$

Extending the function for a single period to allow for multiple periods

$$\sum_{c \in C} cRatio\left(tSW\,[k_1, k_n], \ldots tSW\,[k_n, k_f, f], C\right) = 1 \quad (6)$$

Definition 2:

Let $tSW\,[k_1, k_z]$ and $tSW\,[k_1', k_z']$ be two stress waves that have $tSW\,[k_1, k_n]$ and $tSW\,[k_1', k_z']$ as the point of stress. The distribution category K is named $tSW\,[k_1, k_z]$ and K is equivalent, only if, the analysis, γ has been set to 0.2 on the Euclidean distance of its distribution category $cDist[.] \leq \gamma$, and

$$cDist\left(tSW\,[k_1, k_z]tSW'[k_1', k_z']\right) \quad (7)$$

$$= \sqrt{\sum_{c \in C}\left(\left(cRatio(tSW\,[k_1, k_n], c) - \left(cRatio\left(tSW'[k_1', k_n'], c\right)\right)\right)^2\right.}$$

Assume a series of teen sporadic posts generated through $[k_1, k_z]$ is observed as high-stress waves D and small stress waves W. $tSW\,[k_1, k_z]$ is considered a stressful time, only if the following four conditions are satisfied.

- The initial period k_1 and the end k_z include at least one stressful post.
- Every two major B-stress waves are different in classes.

In traditional non-stress event times, the probability of traumatic γ_1 in $[k_1, k_z]$ being greater than α is above expectation (Fig. 5).

The extraction process for an optimum stressful period

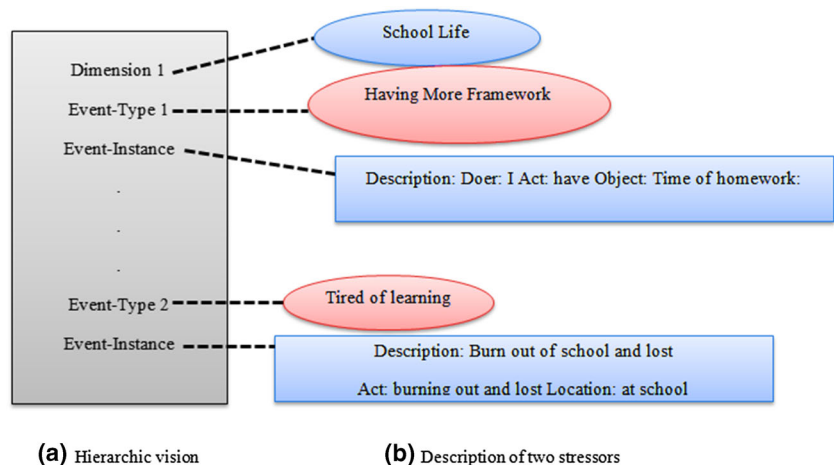The analysis in three phases of the highest stressful periods:

Step 1: Let RG be stressful times in different forms. $RG = B$ at the beginning.

Step 2: Combined with increasing big stress wave d in RG before or next to them, whether the outcome is stressful. Every time, it checks the fusion, beginning from the neighbor with the distribution of the topic d more identical. They replicate stage 2 before the exhausting period is no longer reached. It eliminates d from RG and moves the long stress duration obtained into RG.

Step 3: Combine each of the two adjacent stressful periods in RG (not including small wave gaps) if the effects are both stressful. The method is identical to step 2. It repeats step 3 until there is no more combination. These eliminate the stressful times from RG and transfer the stressful duration received into RG. The RG outcome retains all full stress periods.
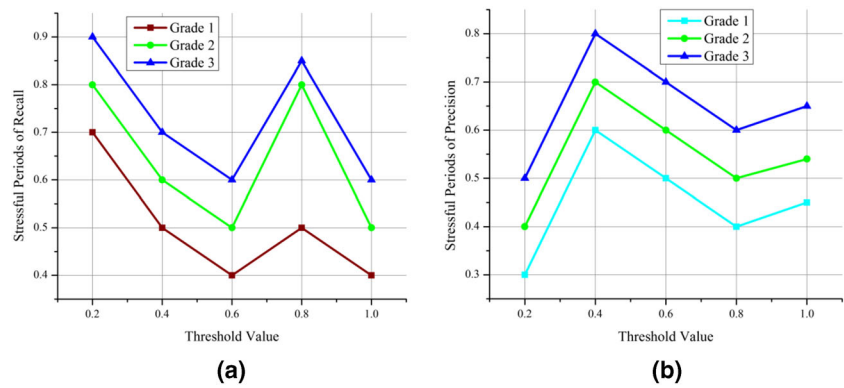
Stress Extraction from High-Stress Periods

Stressor Events Description

Stressor events are form [*dimension, category of event, event instance, influence*], *doer element, behavior, object, time or position*, which can be empty. The occurrence-instance involves a single event involving the performer, act, object,

Fig. 5 Stressor events example

(a) Hierarchic vision   (b) Description of two stressors

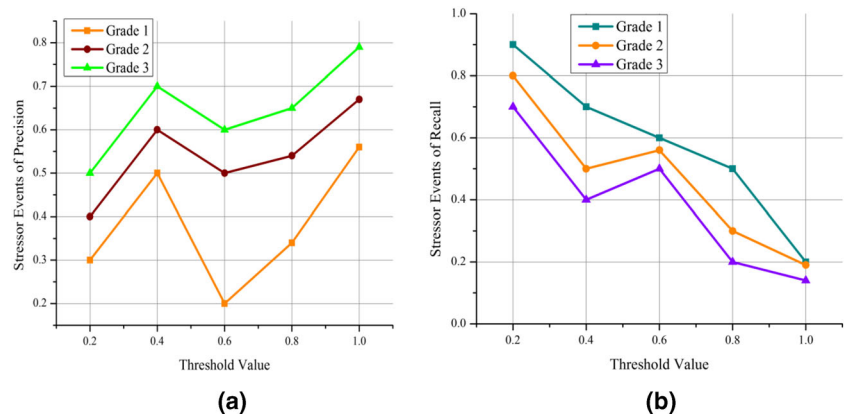**Fig. 6** Quality of the average stress periods in three separate ranges for the 124 students detected

date, location and a concise description. Figure 5 provides an example of two stressful incidents of the form "too much research" and of the sort "study emotions" in the field "student life."

As many things may be identified during the traumatic time of the adolescent by language processing, It identifies them based on their traumatic impact. Given that a stressor typically causes a rise in stress rates, the higher the stress, the greater the effect. The stress impact of the incident is calculated as

$$
\begin{aligned}
influence = X_1 * &\frac{level\ (ef)}{\text{argmax}_{ef\ *\in EF} level\ (ef\ *)} \\
+ X_2 * &\frac{increase\ (ef)}{\text{argmax}_{ef\ *\in EF} increase\ (ef\ *)}
\end{aligned}
\tag{8}
$$

Where 1) *level (ef)*: the average stress degree at a time unit at which the impact of the event starts, It searches at the temporal words/phases representing the date to indicate the start period of the event. 2) *increase (ef)*: the rate of change in the average stress level at the beginning point of the operation. (3) SE shall be the sequence of activities extracted over the maximum stressful period examined, and in the study (4) $X_1 = X_2 = 0.5$.

Stressor Extraction Methods

From every post during a maximum stress period that is defined, thus extract stressors from all posts in the period, combine and rate extracted stressors and finally present them in a three-stage stressor event hierarchy(*Size, type of event, event − instance*).

Step 1. Extract stressors from a post over a set of stress time.

Step 2. In the highest stressful time merge and define stressors from all posts.

Results and Discussion

If added to each post with a stress detector, it senses the tension level in a school life group, family life, peer relationships, and romantic relationship. In each stressful time that discover maximal stress and rank stressor events.

High-Stress Periods Detection

A microblog frame is introduced to diagnose migrant children with traumatic psychological cycles and adverse incidents. The underlying Poisson dependent probability model, together with the event-oriented approach indicated by this paper, attempts at predicting the psychological traumatic periods of

Fig. 7 Performance of stressor events detected (3rd in the top) in three grades for 124 students

Table 3 The efficiency of stress detection (Threshold value is 0.57)

Grades	Top 1			Top 2		
	Recall	Precision	F1	Recall	Precision	F1
1	0.65	0.78	0.62	0.76	0.73	0.82
2	0.73	0.64	0.68	0.87	0.79	0.76
3	0.68	0.75	0.79	0.73	0.85	0.71

Table 5 Five level stress occurrence ratios

Level	Grade 1	Grade 2	Grade 3
self-awareness	0.43	0.46	0.49
school lives	0.34	0.38	0.31
Interaction	0.21	0.27	0.29
Life of the family	0.14	0.17	0.19
Peer Connection	0.043	0.037	0.029

migrant children and stressors from presence to material. Although the simple truth includes activities linked to school life, it disregards the observed maximum stress periods which are not traumatic in the context of school nature. The typical stressful identification efficiency under different trust levels as seen in Fig. 6.

In comparison, the sensitivity improves considerably with the threshold value. It examines the predictive model by discriminating between stressful and stable post-stress rates. Another significant point is that the precision rate is smaller than the recall rate. It is the different test events which can be contained in the basic truth. Yet there are often other difficult times, such as "So much homework" in school life, which normally give school students a lot of homework before an exam. Although such occasions do not occur in the truth of the fields, they are considered as incorrect findings that affect detection precision. The findings of the identification of stressors indicate a similar effect to that of stressful times, as seen in Fig. 7.

The highest F1 value 0.71 can be obtained when the threshold value is around 0.57. Table 3 compares the results when derived stress factors in the highest stressful time are classified as top 1 and top 3. As the first is stricter, the F1 results are 15.2% smaller than the latter, mainly due to a decrease in the recall by 9.56 points.

Evaluation with the State-of-the-Art Approach to Personal Event Identification

While there are no methods to recognizing young people with traumatic periods and challenging events in the research on

Table 4 Comparison between the linguistic process between detection of stressors and the predictive methodology of predicting life events

Grades	Extraction of Stressor Event (Top 1)			Personal Event Identification (Top 2)		
	Recall	Precision	F1	Recall	Precision	F1
1	0.65	0.78	0.62	0.56	0.67	0.65
2	0.73	0.64	0.68	0.65	0.69	0.68
3	0.68	0.75	0.79	0.59	0.61	0.56

the traumatic era, our linguistic system of stressors is similar to that of the state-of-the-art predictive approach to the recognition of personal life events Table 4.

It analyzes the stressor incidents found that the overall traumatic times (not restricted to the aspect of the school life). It counts the number of instances of any stressor overall observed cumulative stress times for each student and measures their occurrence rate by the amount / overall stressful duration. Table 5 indicates the total student event rates of grades. The highest stressors among both classes are self-awareness and school life. This is consistent with the migrant children's psychological study and leads to problems with the inner cognitions of migrant children in school lives.

Conclusion

This paper introduces approaches to evaluate and define stressful times for teens and traumatic microblog events. The association of stressor and traumatic posturing activities is established with an improved Poisson-based probability method. The model shows high-stress levels and removes stress factors from any stressful period. The first stressor event prediction efficiency is even greater than the state-of-the-art approach to individually identified life events and is more precise, more recognizable, and higher in F1. According to the complexity of stressor theory, the identification of stressor occurrences and stress periods and many more associated issues need more research is interesting and difficult. First of all, people's reaction to the stressor defined as the psychological process is indeed an integral part of the theory of stress. Second, while this research indicates a positive direction in identifying traumatic times and stress experiences for migrant children, the microblog remains incomplete and requires a lot of evidence. Numerous sources may be useful and include more detailed and continuous knowledge to further enhance detection efficiency.

Compliance with Ethical Standards

Conflict of Interest No conflict of Interest.

Ethical Approval Statement My manuscript has no associated data or the data that will not be deposited.

Informed Consent This work is original and this manuscript is not previously submitted in some other journals.

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