The Restoring Impact of Uplift Events on Overwhelmed Teenagers on Microblogs

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Abstract

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1. Introduction

Stress. Life is always full of ups and downs. The serious mental health problems caused by stress has become hot issues that are widely concerned around the world. According to APA's newest report in 2018, America' s youngest adults are most likely of all generations to report poor mental health, and 91 percent of Gen Zs between ages 18 and 21 say they have experienced physical or emotional symptom due to stress in the past month compared to 74 percent of adults overall (Association, 2018). Accumulated stress comes from daily hassles, major stressful events and environmental stressors could drain people's inner resources, leading to psychological maladjustment, ranging from depression to suicidal behaviours (Nock et al., 2008). Nowadays more than 30 million Chinese teenagers are suffering from psychological stress, and nearly 30% have a risk of depression (Youth and Center, 2019).

Restoring. Restoring is an essential process in human's stress coping system (Susan, 1984) to help get out of overwhelmed status. Researchers are constantly looking for ways to alleviate stress. Traditional psychology research shows that uplift events could alleviate stress, but the specific restoring mode remains to be further explored. With the rise of social media big data, it provides a new channel for timely and non-invasive exploration of users' mental health status. Previous studies have shown that it is feasible and reliable to detect user's psychological stress and stressor events, and predict future psychological stress trends through social network data. However, research on uplift events still calls for more exploration, due to the uncertainty and complexity of various restoring situations. This article will explore the restoring impact of uplift events from microblogs, help scheduling stress interventions, and predict future stress.

2. Literature review

2.1. The impact of uplift events in restoring process.

Positive life events (called *uplifts* in psychological theory) such as satisfying social interactions, excellent academic performance and pleasant entertainment activities are conceptualized in psychological literature as exerting a protective effect on emotional distress (Cohen et al., 1984; Cohen and Hoberman, 2010; Needles and Abramson, 1990). Compared with adults, young people exhibit more exposure to uplift events, as well as hassles, due to the immature inner status and lack of experience. Researchers indicate that positive events mitigate the relation between negative events and maladjustment in samples of adolescents experiencing family transitions (Doyle et al., 2003). The written expression of positive feelings has also be shown to prompt increased cognitive re-organization among an undergraduate student group (Coolidge, 2009).

Positive uplifts can not only help reinforce adolescents' sense of well-being, and help restore the capacity for dealing with stress, but also have been linked to medical benefits, such as improving mood, serum cortisol levels, and lower levels of inflammation and hyper coagulability (Jain et al., 2010). Through

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examining the relationship between self-reported positive life events and blood pressure (BP) in 69 sixth graders, researchers found that increased perceptions of positive life events might act as a buffer to elevated BP in adolescents (Caputo et al., 1998).

The protective effect of uplift events is hypothesized to operate in two ways: directly and indirectly by 'buffering' effect (Cohen and Hoberman, 2010). In the direct way, the more positive uplift events people experienced, the less distress they experience. While in the indirectly way, positive life events play its role by buffering the effects of negative events on distress. A pioneer experiment conducted by Reich and Zautra provided enlightening evidence for us (Shahar and Priel, 2002). In this experiment, sampled college students who reported initial negative events were encouraged to engage in either two or twelve pleasant activities during one-month, and compared with students in the controlled group experiencing no pleasant activities. Results indicated that participants in the two experimental groups reported greater quality of life compared with controlled students, and participants who engaged in twelve uplift events exhibited lower stress compared with whom engaging two or none uplifts, implicating the protective effect of uplift events on adolescents.

H1: Uplift events could restore adolescents' stress.

2.2. *The trend of restoring in time line.*

Based on ...

H2: The restoring impact of uplift events varies over time.

2.3. *Sensing adolescent stress from social networks.*

Previous exploration for the protective effect of uplift events on adolescents are mostly conducted in psychological area, relying on traditional manpower-driven investigation and questionnaire. The pioneer psychological researches provide us valuable implications and hypothesis, while limited by labor cost, data scale and single questionnaire based method. With the high development of social networks, today adolescents tend to express themselves and communicate with outside world through posting microblogs, at anytime and anywhere. The self-motivated expressions could deliver much information about their inner thoughts and life styles. In recent years, some research on psychological stress analysis based on social network has emerged, from basically detecting stress intensity from microblog content (Xue et al., 2013, 2014), predicting future stress level in time series (Li et al., 2015a,b,c, 2017a), to extracting stressor events and stressful intervals (Li et al., 2017b). These researches explored applying psychological theories into social network based stress mining, offering effective tools for adolescent stress sensing. Nevertheless, few work takes an insight into the restoring function of uplift events, which plays an important role opposite to stress, as the essential way for adolescent psychological stress easing.

H3: Different types of uplift events show variable impact patterns on over-whelmed adolescents.

3. Current study

In this paper, we aim to continually mine the restoring impact of uplift events leveraging abundant data source from microblogs, to further provide guidance for school and parents that when and which kind of uplift events could help relieve students' overwhelmed stress in both stress prevention and stress early stopping situations. To model such a practical application problem, several challenges exist. 1) How to extract uplift events from microblogs and identify corresponding impact interval? The impact of uplift events is highlighted when the teen is under stress, with various relative temporal order. Extracting such scenarios from teen's messy microblogs is the first and basic challenge for further analysis. 2) How to qualitatively and quantitatively measure the restoring impact conducted by uplift events? There are multiple clues related to teens' behaviours from microblogs, i.e., depressive linguistic content, abnormal posting behaviours. The teen might act differently under similar stressful situations when the uplift event happens or not. It is challenging to find such hidden correlation between uplift events and teen's behavioural characters.

Moreover, for different types of uplift events, the restoring impact might be different. And for each individual, the protective and buffering effect for stress might also varies according to the personality. All these questions guide us to solve the problem step by step.

In this paper, we first conduct a case study on real data set to observe the posting behaviours and contents of stressful teens under the influence of uplift events. We conduct the case study on the real data set of 124 high school students associated with the school's scheduled uplift and stressor event list. Several observations are conducted to guide the next step research. Next, we extract uplift events and the corresponding impacted interval from microblogs. We define and extract structural u-

plift events from posts using linguistic parser model based on six-dimensional uplift scale and LIWC lexicons. Independent stressful intervals (SI) and stressful intervals impacted by uplifts (U-SI) are extracted considering temporal orders. To quantify the restoring impact of uplift events, we describe a teen's stressful behaviours in three groups of measures (stress intensity, posting behaviour, linguistic), and model the impact of uplift events as the statistical difference between the sets of SI and U-SI in two aspects: the two-sample based method is employed for variation detection, and the t-test correlation is conducted to judge the monotonous correlation.

4. Method

4.1. Sample

4.2. Variables

4.3. Research model

5. Results

6. Discussion

7. Conclusion

References

A. P. Association, Stress in america: Generation z (2018) 1–11.

M. K. Nock, G. Borges, E. J. Bromet, C. B. Cha, R. C. Kessler, S. Lee, Suicide and suicidal behavior., Epidemiologic Reviews 30 (2008) 133–154.

C. Youth, C. R. Center, Adolescent mental health alarm: nearly 30% have a risk of depression, China Youth News (2019) 1–2.

F. P. D. Susan, Stress: Appraisal and coping (1984) 1–460.

L. H. Cohen, J. Mcgowan, S. Fooskas, S. Rose, Positive life events and social support and the relationship between life stress and psychological disorder., American Journal of Community Psychology 12 (1984) 567–87.

S. Cohen, H. M. Hoberman, Positive events and social supports as buffers of life change stress, Journal of Applied Social Psychology 13 (2010) 99–125.

D. J. Needles, L. Y. Abramson, Positive life events, attributional style, and hopefulness: Testing a model of recovery from depression., Journal of Abnormal Psychology 99 (1990) 156.

K. W. Doyle, S. A. Wolchik, S. R. Dawsonmcclure, I. N. Sandler, Positive events as a stress buffer for children and adolescents in families in transition., Journal of Clinical Child and Adolescent Psychology 32 (2003) 536–545.

F. L. Coolidge, A comparison of positive versus negative emotional expression in a written disclosure study among distressed students, Journal of Aggression Maltreatment and Trauma 18 (2009) 367–381.

S. Jain, P. J. Mills, K. R. Von, S. Hong, J. E. Dimsdale, Effects of perceived stress and uplifts on inflammation and coagulability., Psychophysiology 44 (2010) 154–160.

J. L. Caputo, D. L. Rudolph, D. W. Morgan, Influence of positive life events on blood pressure in adolescents, Journal of Behavioral Medicine 21 (1998) 115–129.

G. Shahar, B. Priel, Positive life events and adolescent emotional distress: In search of protective-interactive processes, Journal of Social and Clinical Psychology 21 (2002) 645–668.

Y. Xue, Q. Li, L. Feng, G. Clifford, D. Clifton, Towards a micro-blog platform for sensing and easing adolescent psychological pressures, in: Proc. of Ubicomp, poster, 2013.

Y. Xue, Q. Li, L. Jin, L. Feng, D. A. Clifton, G. D. Clifford, Detecting Adolescent Psychological Pressures from Micro-Blog, 2014.

Y. Li, J. Huang, H. Wang, L. Feng, Predicting teenager's future stress level from micro-blog, in: IEEE International Symposium on Computer-Based Medical Systems, 2015a, pp. 208–213.

Y. Li, Z. Feng, L. Feng, When a teen's stress level comes to the top/bottom: A fuzzy candlestick line based approach on micro-blog, in: Revised Selected Papers of the International Conference on Smart Health, 2015b, pp. 241–253.

Y. Li, Z. Feng, L. Feng, Using candlestick charts to predict adolescent stress trend on micro-blog ?, Procedia Computer Science 63 (2015c) 221–228.

Q. Li, L. Zhao, Y. Xue, L. Jin, L. Feng, Exploring the impact of co-experiencing stressor events for teens stress forecasting, in: International Conference on Web Information Systems Engineering, 2017a, pp. 313–328.

Q. Li, Y. Xue, L. Zhao, J. Jia, L. Feng, Analyzing and identifying teens stressful periods and stressor events from a microblog, IEEE Journal of Biomedical and Health Informatics 21 (2017b) 1434–1448.