Assessment of Stress-Buffering Effects of Uplift Events on Overwhelmed Teenagers from Microblogs

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Abstract

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Keywords: uplift event, restoring, stress, adolescent, microblogs

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 the newest report of American Psychological Association, the youngest adults are most likely of all generations to report poor mental health in America, 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 (APA, 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).

Stress-buffering. Restoring is an essential process in human's stress coping system (Susan, 1984) to help get out of overwhelmed status. Traditional psychology research shows that stress-restoring could function through various ways, including exercise[xx], self-esteem [xx], changing environments [xx], chatting with friends [xx], writing diaries [xx] and so on. The specific restoring restoring mode remains to be further explored.

With the epidemic of social media among adolescents, 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 stress-buffering effects of uplift events from social networks still calls for more exploration. This article will explore the restoring impact of uplift events from microblogs, help scheduling positive interventions, and predict future stress.

2. Literature review

2.1. *Restorative function of positive life events.*

Positive life events are conceptualized as exerting a protective effect on emotional distress in psychological literature (Cohen et al., 1984; Needles and Abramson, 1990). Many psychological researchers have focused on the restorative function of positive events with respect to physiological, psychological, and social coping resources. (Folkman and Moskowitz, 2010) identified three classes of coping mechanisms that are associated with positive emotion during chronic stress: positive reappraisal, problem-focused coping, and the creation of positive events. The author also considered the possible roles of positive emotions in the stress process, and incorporated positive emotion into a revision of stress and coping theory in the work (Folkman, 1997). They conducted a longitudinal study of the care giving partners of men with AIDS and described coping processes that were associated with positive psychological states in the context of intense distress.

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The protective effect of uplift events was hypothesized to operate in both directly (i.e., more positive uplift events people experienced, the less distress they experience) and indirectly ways by 'buffering' (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.

Positive events was verified as protective factors against loneliness, suicide, daily stressors, depression and helping improve health. (Chang et al., 2015) investigated the protective effect of positive events in a sample of 327 adults, and found that the positive association between loneliness and psychological maladjustment was found to be weaker for those who experienced a high number of positive life events, as opposed to those who experienced a low number of positive life events. This is assistant with the conclusion made by (Kleiman et al., 2014) that positive events act as protective factors against suicide individually and synergistically when they co-occur, by buffering the link between important individual differences risk variables and maladjustment. Through exploring naturally occurring daily stressors, (Ong et al., 2006) found that over time, the experience of positive emotions functions to assist high-resilient individuals to recover effectively from daily stress. In the survey made by (Santos et al., 2013), strategies of positive psychology are checked as potentially tools for the prophylaxis and treatment of depression, helping to reduce symptoms and for prevention of relapses. Through a three-week longitudinal study, (Bono et al., 2013) examined the correlation between employee stress and health and positive life events, and concluded that naturally occurring positive events are correlated with decreased stress and improved health.

Due to the immature inner status and lack of experience (Vitelli, 2014), young people exhibit more exposure to uplift events compared with adults, such as satisfying social interactions, excellent academic performance and pleasant entertainments. 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, 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 examining the relationship between self-reported positive life events and blood pressure in 69 sixth graders, researchers found that increased perceptions of positive life events might act as a buffer to elevated blood pressure in adolescents (Caputo et al., 1998).

H1: Positive events could buffer teen's psychological stress.

H2: High frequency of positive events better relieve stress.

2.2. *Correlation between positive events and future stress.*

Researchers have reported the impact patterns of various positive events on over-whelmed adolescents.

H3: Positive events could predict the trend of teen's future stress.

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., 2014), predicting future stress in time series (Li et al., 2015), to extracting stressor events and stressful intervals (Li et al., 2017). 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.

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 uplift 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

APA, 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.

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.

S. Folkman, J. T. Moskowitz, Stress, positive emotion, and coping, Current Directions in Psychological Science 9 (2010) 115–118.

S. Folkman, Positive psychological states and coping with severe stress, Social Science and Medicine 45 (1997) 1207–21.

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.

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.

E. C. Chang, M. Muyan, J. K. Hirsch, Loneliness, positive life events, and psychological maladjustment: When good things happen, even lonely people feel better! ☆, Personality and Individual Differences 86 (2015) 150–155.

E. M. Kleiman, J. H. Riskind, K. E. Schaefer, Social support and positive events as suicide resiliency factors: Examination of synergistic buffering effects, Archives of Suicide Research 18 (2014) 144–155.

A. D. Ong, C. S. Bergeman, T. L. Bisconti, K. A. Wallace, Psychological resilience, positive emotions, and successful adaptation to stress in later life., Journal of Personality and Social Psychology 91 (2006) 730–49.

V. Santos, F. Paes, V. Pereira, O. Ariascarrión, A. C. Silva, M. G. Carta, A. E. Nardi, S. Machado, The role of positive emotion and contributions of positive psychology in depression treatment: systematic review., Clinical Practice and Epidemiology in Mental Health Cp and Emh 9 (2013) 221.

J. E. Bono, T. M. Glomb, W. Shen, E. Kim, A. J. Koch, Building positive resources: Effects of positive events and positive reflection on work stress and health, Academy of Management Journal 56 (2013) 1601–1627.

R. Vitelli, Hassles, uplifts and growing older, https://www.psychologytoday.com/blog/media-spotlight/201406/hassles-uplifts-and-growing-older, 2014.

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.

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, 2015, pp. 208–213.

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 (2017) 1434–1448.