



# The Association Between Stress Exposure, Traumatic Stress and Post-traumatic Growth Among Hong Kong Young Adults Under the “Double-Hit” of Social Unrest and COVID-19

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**Abstract.** This study investigated the probable traumatic stress (PTS), post-traumatic growth (PTG), and perceived impacts among Hong Kong young adults aged between 18 and 30 in September 2021, which is about 1.5 years after the Anti-ELAB social movement and COVID-19 pandemic have put everything into a stop. Among 251 participants, 46.8% scored above 32 out of 88 on the Impact of Events Scale-Revised, which indicated clinical levels of PTS, and 6.4% scored above 4 out of 5 on the Post Traumatic Growth Inventory, which displayed significant post-traumatic growth. Perceived impacts from the social movement (Means ( $SD$ ) = 3.52 (1.91)) and COVID-19 (Means ( $SD$ ) = 4.38 (1.82)) were moderate. Four groups were divided based on the cut-off scores: (1) Low PTS and Low PTG (50.6%); (2) High PTS and Low PTG (39.8%); (3) Low PTS and High PTG (2.4%); (4) High PTS and High PTG (4.0%). Results of one-way ANOVA showed that there were significant difference between the perceive level of PTS and PTG with the perceived impacts of social unrest ( $F(3, 242) = 5.66, p = .001$ ) and COVID-19 ( $F(3, 242) = 4.84, p < .01$ ). Persons in group 4 reported more perceived impacts in social unrest than group 1 and 2. Meanwhile, group 2 also reported a higher level of perceived impacts in COVID-19 than group 1.

**Keywords:** social movement · COVID-19 · post-traumatic growth · post-traumatic stress · Hong Kong

## 1 Introduction

Social movement have long been a part of the modern human history. More than 180 countries have experienced social movement of different scales over the past half-a-century (Tarrow 2011). In recent years, a tsunami of social movements has swept across different corners of the globe, from France and Algeria, to Russia and Iran (Moeini et al. 2019; Wright 2019; Garguilo 2019). Among these social movements, those sparked off by the Extradition Law Amendment Bill (i.e., AntiELAB movement) could be one

of the most recognizable ones. The movement has led to sanctions from the Western democracies towards People's Republic of China (P.R.C.). Hong Kong was also hugely impacted by the series of conflicts between the United States and the P.R.C.

Political and military conflicts are often associated with widespread psychological distress in the residents of the conflict-affected areas (Steel et al. 2009; Corrieri et al. 2014; Charlson et al. 2019). According to a recent meta-analysis, the prevalence of mental disorders, including depression, bipolar disorder, schizophrenia and post-traumatic stress disorder (PTSD) in conflict-affected settings was estimated to be over 22% (Charlson et al. 2019). In conflict-affected of north, central, and south regions in Arab countries (such as Iraq, Syria, and Yemen), a prevalence of 34% for moderate to severe depression has been noted among the its adolescents (Dardas et al. 2018). A high rate of probable depression and PTSD were also reported in the participants of the recent Yellow Vests protests in France (Adam-Troïan et al. 2020). According to a systematic review of 52 studies from 20 countries or regions, the prevalence of PTSD among residents ranged from 4% to 41% in conflict-affected areas (Ni et al. Ni et al. 2020a).

### 1.1 The Double-Hit by Social Movement and COVID-19 in Hong Kong

Hong Kong has experienced waves of massive social unrest against the ELAB that would have allowed the Hong Kong authorities to extradite individuals to Mainland China in June 2019. According to a survey conducted in late-July 2019, over half of the sample completely disagreed with the bill (Hong Kong Public Opinion Research Institute 2020). As claimed by the organizers of an early large-scale social movement, over 1.03 million Hong Kong citizens have participated in that movement on 16 June, 2019 (Lague et al. 2019). Despite the Hong Kong government's suspension on the bill eventually, the prolonged and large-scale movements had evolved into city-wide, frequent, violent clashes between activists and the police. These clashes had eventually escalated into massive bloodshed and arrest actions. It was only until the beginning of the first coronavirus disease 2019 (COVID-19) outbreak in early 2020 when these social movements have subsided.

During or even after the Anti-ELAB Movement, studies have found a significant increase in PTS among Hong Kong young adults. Compared to the Occupy Central Movement in 2014, during the heights of the social movement in late-2019, the prevalence of probable depression and PTSD has doubled, from 1.9% and 6.5% to 11.2% and 12.8% respectively (Ni et al. 2020b). Subsequently, the prevalence of probable depression and anxiety further increased to 28.2% and 19.2% between February and March 2020 (Hou et al. 2021a). At the anniversary of the social movement when the National Security Laws were introduced in July 2020, Hou et al. (2020; 2021b) documented that the prevalence of probable depression slightly decreased to 25.7%, with suicidal ideation reaching 9.1%. The above findings suggest that Hong Kong citizens had experienced a public mental health crisis over the past two years.

The first COVID-19 outbreak began in January 2020. COVID-19 has eventually become a pandemic affecting over 225 countries and territories, leading to over 233,000,000 confirmed cases and over 4,700,000 deaths by late-September 2021 (World Health Organization 2022). In Hong Kong, there were over 12,000 confirmed cases, including 213 deaths by late-September 2021, which has remarkably surpassed the number of cases (i.e., 1755) of the Severe Acute Respiratory Syndrome (SARS) in 2003 (Leung et al. 2009). Marked PTS was reported among 13.3% - 18.0% of the participants in a population-based telephone survey conducted during SARS in 2003 (Lau et al. 2005). When compared with the COVID-19, a local study Lau et al. (2021) revealed that about one in four of the participants reported PTS disorder during first outbreak in March/April 2020, which is remarkably higher than Ni et al. (2020) collected during the Anti-ELAB social movement in late-2019.

## 1.2 Hong Kong Young Adults Under the ‘Double-Hit’

Young adults have been active participants of the Anti-ELAB social movement, and have unfortunately made up a significant proportion of the arrestees being charged with subversion, rioting, unlawful assembly, vandalism, etc. In the study of Li et al. (2021) which was a survey about protestors in the Anti-ELAB social movement, 21.9% and 38.9% of their participants in August 2019 and October 2019 were aged between 16 and 25. The results represent a high proportion of young adults engaged in the social movement. By June 2020, over 60% of the arrestees were aged between 18 and 30 years old (Arranz 2020). By February 2021, over 40% of the arrestee in the movement were students, including 55% of them being post-secondary students (Ho 2021). Li et al. (2021) have conducted a latent class analysis on their sample collected in October 2020. The analysis identified five class memberships: (1) Youth, (2) Allies, (3) Supporters, (4) Sympathizers, and (5) Frontliners. Frontliners (22% of the sample) and Youths (14.4% of the sample) were the main participants. Frontliners contained the characteristics of heavily male, younger; and youths were majority students and all younger than 25 years-old. These two classes reported the highest percentage of severe depression (Frontliners: 25.9% and Youths: 19.3%) and anxiety (Frontliners: 38.5% and Youths: 31.0%). The extent of exposure to potentially traumatic events (such as the usage of pepper spray and tear gas being fired) in the social movement was closely correlated with the levels of mental distress. Based on this study, we postulated that Hong Kong young adults are at a particular high risk for poor mental health as an aftermath of the intense social movement. Meanwhile, COVID-19 is also a source of psychological distress among Hong Kong young adults. According to the Hong Kong Census and Statistics Department (2021), the age group of 20–29 had the highest unemployment rate compared with other age groups (such as 30–39, 40–49, 50–59, etc.) during January 2020 to September 2021. The unemployment rates of the age group of 20–29 remained consistently high which ranged from 6.8% to the peak of 12.0%. Hence, it is possible that for young adults, the occurrence of COVID-19 outbreak toward the end of an intense social movement may have created ‘double-hit’ scenario with two distinct stressors prevailing in the society, affecting multidimensional adjustment and healing from torn socio-political fabric.

### 1.3 Post-traumatic Growth

In spite of the well-documented psychopathological consequences, increasingly research has turned to examining the positive changes after traumatic or significantly stressful events. Tedeschi and Calhoun (2004) proposed the concept of PTG, referring to the “positive psychological changes experienced as a result of the struggle with highly challenging life circumstances.” Lau et al. (2021) examined the PTS and PTG during the first outbreak of COVID-19. The study revealed that about one in five of their participants reported PTG in either one of the following domains including Self, Interpersonal, Spiritual or Life orientation, or a combination of domains. PTG are more likely to emerge in participants who have higher PTS. Also, their study has revealed the mediating role high sense of coherence coupled with high PTS on the relationship between perceived outbreak severity and PTG.

In light of the possibility of having both positive and negative consequences after a trauma (Tedeschi and Calhoun 2004), this study aimed at exploring the levels of PTS and PTG in a convenience sample of young adults and the relationship among PTS, PTG, as well as the impacts they have experienced from the social movement and COVID-19. In order to explore the dynamic properties of PTS and PTG among young adults in Hong Kong over past two years, we divided participants into high and low PTS and PTG, and compared perceived impacts experienced by these four groups.

## 2 Material and Methods

### 2.1 Sample

Eligible participants were Hong Kong Chinese residents aged between 18 to 30. Individuals who cannot read traditional Chinese or have no access to the internet were excluded. The survey link was distributed via social media (e.g., Facebook, Instagram, WhatsApp groups, Signal groups, Telegram channels). The participants were recruited through snowballing in September 2021.

### 2.2 Instruments

**Impact of Event Scale-Revised (IESR).** The 22-item Impact of Event Scale-Revised was used (Wiess 2007). The scale tapped into hyperarousal, intrusion and avoidance of PTS. Participants answered on a 5-point scale running from 0 (not at all) to 4 (extremely). The responses on the items were summed up to form an overall scale score. The Cronbach alphas was .93, indicating good reliability.

**Post-Traumatic Growth Inventory (PTGI).** The 21-item Post-Traumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996) was adopted. Participants responded on a 6-point scale running from 0 (none) to 5 (very much) which contains four dimensions, including self (items 8, 9, 10, 11, 13, 19, 21), interpersonal (items 6, 7, 12), spiritual (items 4, 5, 6), and life orientation (items 1, 2). The scale score was derived by taking the average across the responses on the items. The Cronbach alphas was .95, indicating good reliability.

**Perceived impact of Social Movement and COVID-19.** Perceived impact of the social movement and COVID-19 were measured by five items – “On a scale of 1 (not at all) to 10 (extremely severe), to what extent the social movement have impacts on study/work, family relationships, social interaction and daily life”. Then, a similar set of questions would be asked by inviting participants to reflect on the impacts of COVID-19. The scale scores were derived by taking the average across the responses on the items. The Cronbach alphas of social movement and COVID-19 were .81 and .71 respectively, indicating reasonable reliabilities.

**Demographics.** Demographic characteristics such as gender, age, education background, and household monthly income were also collected from the online survey.

### 2.3 Procedure

This book chapter reports the baseline findings of a longitudinal study that included three time-points (September 2021, November 2021, and January 2022). All three waves were conducted through an online survey. Participants’ responses were matched by their phone number and/or participant number. Participants filled in a battery of questionnaires, including those mentioned above, after providing their e-consent. This study received ethical clearance from the Human Research Ethics Committee (HREC) of the Hong Kong Shue Yan University.

### 2.4 Statistical Analysis

Descriptive statistics of PTS, post-traumatic growth, perceived impact of the social movement and COVID-19 were explored. The differences among the 2x2 matrix of high and low level of PTS (by the cut-off point 32 out of 88), PTG (by the cut-off point 4 out of 5) were investigated using One-way ANOVA, with post-hoc adjustment by Bonferroni method.

## 3 Results

### 3.1 Sample

Among the 251 participants, 59.8% were females, with an average age of 23.2 (SD = 3.26, ranging from 18 to 30). 69.3% of the sample had no religion, while 70.5% were university students, with a median household income of HKD\$30,000–39,000. Sociodemographic characteristics such as age, gender, household monthly incomes are summarized in Table 1 (refer to Appendix A).

### 3.2 Proportion of Probable Traumatic Stress and Post-traumatic Growth

The proportion of participants with PTS was 46.2%, with a score of 32 out of 88. 6.4% of the sample reported PTG, with a score of 4 out of 5. The perceived impact from the social movement (Means (SD) = 3.52 (1.91)) and COVID-19 (Means (SD) = 4.38 (1.82)) were moderate. Putting PTS and PTG into consideration, four groups were divided based on the cut-off scores: (1) Low PTS and Low PTG (50.6%); (2) High PTS and Low PTG (39.8%); (3) Low PTS and High PTG (2.4%); (4) High PTS and High PTG (4.0%).

The PTS and PTG were positively correlated ( $r = .25, p < .001$ ); the perceived impact of social movement and COVID-19 were positively correlated ( $r = .55, p < .001$ ); the PTS, perceived impact of social movement and COVID-19 were positively correlated ( $r = .28, p < .001$ ;  $r = .27, p < .001$ ). The PTG, perceived impact of social movement were positively correlated ( $r = .14, p = .03$ ), while the PTG and perceived impact of COVID-19 were uncorrelated ( $p > .05$ ).

The perceived impact of COVID-19 ( $M = 4.38, SD = 1.82$ ) in the sample was higher than the perceived impact of the social movement ( $M = 3.52, SD = 1.90, p < .001$ ).

### 3.3 Association Between Probable Traumatic Stress, Post-traumatic Growth Category and Perceived Impacts

The four groups, with Low PTS coupled with Low PTG being Group 1, High PTS and Low PTG being Group 2, Low PTS and High PTG being Group 3, and lastly High PTS and High PTG being Group 4, were significantly different in terms of their perceived impacts by social movement ( $F(3, 242) = 5.66, p = .001$ ) and COVID-19 ( $F(3, 242) = 4.84, p < .01$ ). After Bonferroni adjustment, it was found that group 4 ( $M = 5.22, SD = 3.04$ ) reported more perceived impacts in social movement than group 1 ( $M = 3.16, SD = 1.67, p = .004$ ) and group 3 ( $M = 2.70, SD = 1.42, p = .048$ ). The perceived impacts between group 1, 2, 3 were not significantly different.

Meanwhile, group 2 ( $M = 4.80, SD = 1.78$ ) also reported a higher level of perceived impacts in COVID-19 than group 1 ( $M = 3.95, SD = 1.63, p = .003$ ). There were no significant different between group 2, 3, and 4. Table 2 (refer to Appendix B) provides the details of the four groups and Fig. 1 (refer to Appendix C) illustrates the comparison of the perceived impacts among the four groups in the context of the social movement and COVID-19.

## 4 Discussion

This study investigated the PTS and PTG after a period of widespread and intense political conflicts and the emergence of COVID-19 in Hong Kong. By dividing participants by high and low levels of PTS and PTG into a 2x2 matrix, group 1 (Low PTS/Low PTG), group 2 (High PTS/Low PTG), group 3 (Low PTS/High PTG), and group 4 (High PTS/High PTG) were composed of 50.6%, 39.8%, 2.4% and 4.0% of the participants respectively. Four groups showed significant differences in perceived impacts of the social movement and COVID-19. In the context of social movement, group 4 reported higher perceived impacts than group 1 and 3. In the context of pandemic, group 2 reported

higher perceived impacts than group 1. Nearly half (46.2%) of our sample exhibited a significant level of PTS, which is consistent with the previous local findings collected in late-2020 and early-2021 (Ni et al. 2020a, Lau et al. 2021). Our estimate indicated that young adults were still traumatized by these events, even though two years have passed since the last Anti-ELAB social movement and the city was not under lockdown at the time of data collection. Yet, only 6.4% of our participants reported they have experienced PTG in either of the domains including Self, Interpersonal, Spiritual or Life orientation, or a combination of domains during September 2021. The percentage is notably lower than the existing estimates of PTG (18.0%) collected between March and April 2020 (Lau et al. 2020). Compared with Ng (2020), 47.3% of their participants in China have reported PTG in either one of the domains. Our findings show that the estimates of PTG could be deeply affected by time and the differences in social context. As our findings were collected at September 2021, when pandemic in Hong Kong was not severe for a few months, young adults in Hong Kong may feel less stressful about COVID-19. Echoing Lau et al. (2020) and the transformational model (Tedeschi and Calhoun 2004), experienced stress is essential for PTG to emerge.

Nearly half of our participants reported the experience of PTS, while about 7% of our participants reported PTG. The bivariate correlation showed that PTS and PTG were positively correlated ( $r = .25, p < .001$ ), which supports that PTS and PTG co-exist. It is consistent with previous findings that there are positive associations between PTS and PTG (Taku et al. 2008; Bensimon 2012).

Our findings demonstrated that individuals with higher levels of PTS and PTG reported more perceived impacts from the social movements when compared with those with lower PTS and PTG. Interestingly, when compared with individuals with lower PTS but higher PTG, they have similar pattern of perceived impacts from the social movement. Based on the transformational model of Tedeschi and Calhoun (2004), struggling with the “seismic” event is one of the crucial steps for facilitating PTG. In other words, as PTS and PTG can co-exist, individual who are still struggling with the traumatic event, even though they already have a certain level of PTG, they still tend to consider the social movement as severe. However, when individuals are no longer struggling with the social movement and perceived it as “non-traumatic”, regardless of their experienced PTG, they would not consider the social movement as “severe” anymore. In other words, it is important to found out whether individuals with higher PTS and PTG really gain the real growth after the traumatic event or not. This sheds the light toward using both PTS and PTG to measure genuine, as opposed to, illusory growth. Also, combining with positive psychological state measurements will help validate an individual’s positive changes (Mangelsdorf et al. 2018; Boals & Schuler 2018; Infurna and Jayawickreme 2019). Hence, in order to illustrate the pattern of PTG, as well as distinguish genuine growth and illusory growth, our findings underscore the importance of measuring the above elements in a longitudinal manner.

Participants with higher levels of PTS compound with lower PTG reported more perceived threats from COVID-19 than individuals with lower PTS and PTG. This estimate captures a more realistic context under the outbreak, with the implication that people are still facing the risk of infection on daily basis. Such mental distress is persistently found in citizens of Hong Kong, which may be also compounded by different forms of social



distancing policies. According to Diamond et al. (2013), under conditions of ongoing traumatic stress, most people may experience a certain high level of arousal, hypervigilance and avoidance. However, reactions in excess of such level would be considered as pathological. Compared to 2003 SARS epidemic, the informational stressors that individuals assessed from news and different social media are more intensive. Meanwhile, living in crowded living environment like Hong Kong, individual's infection risk is higher than the less populated areas. Keep taking precautions to prevent infection, such as wearing mask, receiving vaccines and cooperate with the latest pandemic policies forming ineluctable circumstances of ongoing traumatic stress. The different psychological states evoked by the social movement and COVID-19 show that the closeness of the event is essential in explaining young adults' psychological reactions and sensitivities.

The current study is one of the first to describe young adults' experience of PTS and PTG during the "double-hits" stressors from social movement and the COVID-19 pandemic. Our findings underscored the raging COVID-19 and social movement are great sources of distress and stress among nearly half of the young adults. Community members should formulate intervention and self-care programs for young adults during or even after the pandemic, in order to resolve the mental health crisis among young adults, such as rebuilding and re-facilitating their well-being, daily routine and life planning. Similar online workshops specialized in equipping individuals with tools and techniques to support them with managing their wellbeing during the pandemic were launched by local non-governmental organization (such as Mind HK, Shall We Talk). Organization like "From Trauma to Transformation" would also provide online courses aimed to accompanying Hong Kong people to transform from social trauma. Further studies should examine the long-term consequences of the social movement and COVID-19.

There were some limitations in this study. First, the study is limited by the cross-sectional setting. We have relied on one time-point to assess individuals' PTS, PTG and perceived impacts, which are not able to assess the changes along the time when the pandemic in Hong Kong became severe and the emergence of the fifth outbreak in Hong Kong. At the time of data collection, the severity of the pandemic was relatively low and there was no lockdown of the city. Therefore, the findings may not be directly generalizable to the regions where COVID-19 has been very severe (e.g., lockdown, high number of confirmed cases). Second, non-random sampling method was adopted in the present study. Snowballing through the social media (e.g., Facebook, Telegram) by disturbing the survey link has limited the reach rates of a certain demographic groups, such as the employees. As a result, some groups were being under-represented (e.g., less employees, less young adults with older age, less males). Future studies may examine PTG in both collective and personal segments in location with high pandemic severity, using more random sampling methods.



## 5 Conclusions

To conclude, this study illustrated a comprehensive picture about the psychological consequence from the Anti-ELAB social movement and COVID-19. Our study shows the coexistence of PTS and PTG, and they are not mutually exclusive. It will be helpful for understanding the continuity of the trauma events of the moment that have heavily influenced Hong Kong young adults, as well as providing empirical foundation for building mental health support for enhancing resiliency of young adults.

## Appendix A

**Table 1.** Sociodemographic characteristics

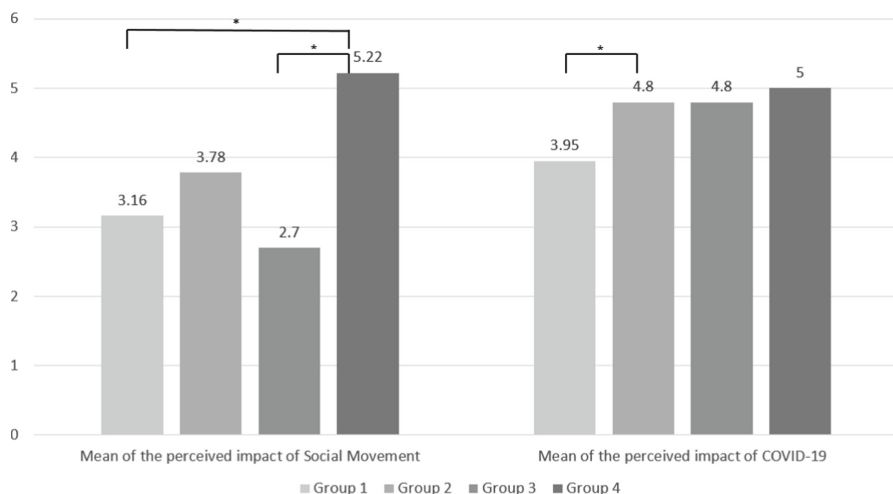
	<i>N (%)</i>
<b>Gender</b>	251
Female	150 (59.8%)
Male	101 (40.2%)
<b>Current status</b>	251
Studying	177 (70.5%)
Working	74 (29.5%)
<b>Monthly family income</b>	251
HKD\$40,000 or more	87 (34.7%)
Less than HKD\$40,000	164 (65.3%)
<b>Religious affiliation</b>	251
Yes	77 (30.7%)
No	174 (69.3%)

## Appendix B

**Table 2.** Perceived impacts of the social movement and COVID-19 by the subgroups. (Group 1: Low PTS/Low PTG; Group 2: High PTS/Low PTG; Group 3: Low PTS/High PTG; Group 4: High PTS/High PTG)

Group	N(%)	Age	Gender		Current Status			Religion		Monthly household income		Perceived impact of social movement <i>M(SD)</i>	Perceived impact of COVID-19 <i>M(SD)</i>
			Male N (%)	Female N (%)	Studying N (%)	Working N (%)	Yes N (%)	No N (%)	Less than HKD\$40,000	HKD\$40,000 or more			
1	127 (50.6%)	23.1 (3.18)	57 (44.9%)	70 (55.1%)	90 (70.9%)	37 (29.1%)	34 (73.2%)	93 (26.8%)	79 (62.2%)	48 (37.8%)	3.16 (1.67)	3.95 (1.63)	
2	100 (39.8%)	23.3 (3.32)	32 (32.0%)	68 (68.0%)	69 (69.0%)	31 (31.0%)	35 (65.0%)	65 (35.0%)	68 (68.0%)	32 (32.0%)	3.78 (1.87)	4.80 (1.78)	
3	6 (2.4%)	25.2 (3.60)	3 (50.0%)	3 (50.0%)	4 (66.7%)	2 (33.3%)	1 (83.3%)	5 (16.7%)	3 (50.0%)	3 (50.0%)	2.70 (1.42)	4.80 (2.66)	
4	10 (4%)	22.6 (3.31)	5 (50.0%)	5 (50.0%)	8 (80.0%)	2 (20.0%)	3 (70.0%)	7 (30.0%)	8 (80.0%)	2 (20.0%)	5.22 (3.04)	5.00 (2.59)	

## Appendix C



**Fig. 1.** Mean of the perceived impact of social movement & COVID-19 among groups (Group 1: Low PTS/Low PTG; Group 2: High PTS/Low PTG; Group 3: Low PTS/High PTG; Group 4: High PTS/High PTG)

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