Predictors of well-being during the COVID-19 pandemic: The importance of financial satisfaction and neuroticism

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Abstract
Current research suggests that the COVID-19 pandemic adversely impacts well-being. This study examined how subjective well-being (SWB) and psychological well-being (PWB) in Singapore were affected during the pandemic, and the factors that were important to SWB. A representative sample of 999 respondents completed an online survey during the pandemic in August 2020 (after a lockdown was lifted). Two hundred and thirty-two respondents completed the follow-up Wave 2 survey 4 months later. Analyses showed that SWB and PWB during the pandemic were significantly lower than the prepandemic period. However, by Wave 2, well-being levels recovered to levels similar to those observed in the prepandemic period. Regression analyses showed that previously established key determinants of SWB were still important predictors during the pandemic. Specifically, neuroticism and financial satisfaction were strongly associated with all three major SWB components. PWB, particularly in terms of meeting one's psychological needs for autonomy and mastery, was also closely related to SWB. The importance of financial satisfaction suggests that one avenue to buffer the detrimental effects of the pandemic on well-being would be to formulate economic policies that can alleviate the pandemic's negative financial impact.

KEYWORDS
COVID-19 pandemic, financial satisfaction, neuroticism, psychological well-being, subjective well-being
The COVID-19 pandemic has drastically affected people’s lives across the globe, with its impact extending beyond that of physical health. It has altered work and school arrangements, restricted social interactions and (to some degree) people’s autonomy, and impeded international travel for most. Beyond the salient effects on the health, social, and economic domains, a crisis of such magnitude would also impact the psychological domain. Facing the prolonged negative impact of the pandemic may adversely affect people's subjective and psychological well-being (PWB). Encompassing multiple components—life satisfaction, positive affect, and negative affect (Diener et al., 1999), subjective well-being (SWB) is a broad construct that reflects global happiness. Conversely, PWB emphasizes self-realization, that is, happiness results from fulfillment of one’s potentials and innate psychological needs, such as having autonomy, social support and positive relations, or gaining mastery (Ryan & Deci, 2001; Ryff & Keyes, 1995). The question thus is whether people’s well-being would decline during the pandemic, given the stress associated with fear of contagion, lockdown, social isolation, and financial uncertainty? And what are the factors important to well-being in the times of the pandemic?

Social distancing has greatly reduced and restricted social and familial activities and relationships, for example, family gatherings or caregiving (Losada-Baltar et al., 2021). Research, however, has shown that social relationships are essential for well-being (Helliwell & Putnam, 2004). People who are closer to their family, friends, and the community, and have more relationships tend to be happier, healthier, and live longer compared to their less social counterparts. The importance of social support for well-being appears universal—across the world, having social support is associated with experiencing more positive feelings and less negative feelings (Diener et al., 2010). Activities that facilitate social connectedness (e.g., socializing and engaging in intimate relations) are also associated with greater happiness than other activities such as working and commuting (Mogilner, 2010). Indeed, a representative German study found that participants who described active social pursuits (e.g., spending more time with family and friends) subsequently reported higher life satisfaction a year later, as compared to those who described nonsocial pursuits (e.g., finding a better job) (Rohrer et al., 2018). This effect was due to increased socializing. Closer social ties are not only beneficial to well-being, but are associated with lower risk of illness onset and premature mortality (Bzdok & Dunbar, 2020; Cohen & Pressman, 2006). In contrast, social isolation can lead to a sense of loneliness, which is linked to reduced immune system response and increased risk for early mortality (Holt-Lunstad et al., 2015). Loneliness is also a known risk factor for cognitive decline. A systematic overview (involving over 40 systematic reviews) highlighted that social isolation and loneliness are linked to worse cardiovascular and mental health outcomes (Leigh-Hunt et al., 2017). In summary, social isolation has severe consequences for mental and physical health and is crucial to survival (Bzdok & Dunbar, 2020).

The effects of the pandemic on well-being are far-reaching and have been observed in countries across the world. For example, a national survey on the mental health of people in Australia during the first month of lockdown measures due to COVID-19 found high prevalence of depression—over 50% reported clinically significant or mild symptoms of depression, which was higher than in previous surveys (Fisher et al., 2020). This shows that such restrictions negatively impact people’s well-being. In China, a study assessing mental health among youths 2 weeks after the occurrence of COVID-19 found that over 40% of the youths had poor mental health and had a tendency toward psychological problems, while over 14% reported posttraumatic stress disorder symptoms (Liang et al., 2020). In Portugal, people reported poorer mental health and lower vitality in the sixth consecutive week of lockdown, as compared to before the pandemic (Vieira & Meirinhos, 2021). Similarly, Zacher and Rudolph (2021) found that SWB in Germany decreased between March 2020 and May 2020. Specifically, life satisfaction and positive affect decreased, although unexpectedly, there was also a decrease in negative affect. Therefore, across numerous studies conducted in the past year of the ongoing pandemic, the findings suggest that the lockdowns and economic problems had resulted in lower well-being, and higher levels of anxiety and depression, particularly among at-risk populations such as healthcare workers (Saladino et al., 2020).

Findings from other studies, however, suggest that people may demonstrate greater resilience to adverse events, and that the deleterious effects of the pandemic on well-being may be impermanent. In their study, Sibley et al. (2020) compared matched samples of New Zealanders based on data collected before the pandemic.
(October to December 2019) and during a lockdown (March to April 2020). Although people in the pandemic group reported higher levels of mental distress than those in the prepandemic group, there were no differences between the two groups on life satisfaction, perceived social support, or satisfaction with health or standard of living.

1 | PREDICTORS OF WELL-BEING

Research on well-being during the pandemic has focused more on the pandemic's negative impact and less on the predictors of well-being. Nevertheless, it is well-established that factors such as personality traits, psychological needs, financial satisfaction, and health are important predictors of SWB (e.g., Ng & Diener, 2014; Steel et al., 2008; Tay & Diener, 2011). For instance, higher financial satisfaction is consistently strongly correlated with higher SWB, in both worldwide samples (Ng & Diener, 2014) and a Singaporean sample (Ng et al., 2019). Additionally, financial difficulties in the family due to the pandemic were found to be associated with greater psychological distress and lower quality of life among Filipino adults (Aruta et al., 2021). Financial difficulties also predicted lower life satisfaction and flourishing, and more symptoms of depression and anxiety among Filipino students during the pandemic (Galanza et al., 2021). Another key determinant of SWB is health—analyses from the World Values Survey showed that those who reported better health are happier and more satisfied with their lives (Ngamaba, 2017).

Besides external factors, dispositional factors like psychological needs and personality traits also affect SWB. Self-determination theory posits that fulfillment of one's basic psychological needs not only fosters PWB, but SWB as well (Ryan & Deci, 2001). There is evidence that fulfillment of psychological needs (e.g., respect, autonomy) is strongly related to positive and negative feelings (Diener et al., 2010; Tay & Diener, 2011). Similarly, there is robust evidence that the Big Five personality traits, especially neuroticism and extraversion, are closely associated with SWB. Lower neuroticism and higher extraversion are associated with greater life satisfaction and positive affect, and lower negative affect (DeNeve & Cooper, 1998), with their correlations usually ranging from 0.40 to 0.50 (Lucas & Fujita, 2000; Steel et al., 2008). In meta-analyses, estimates based on the Big Five personality model indicate that the Big Five traits account for approximately 39% of the variance in SWB (Steel et al., 2008). While psychological needs and personality traits are relatively stable predictors of SWB, will the strong situational influence of the pandemic weaken their effects? And will external factors such as financial and health satisfaction be even more susceptible to such situational influences?

The lack of social activities due to the pandemic-imposed social distancing restrictions may weaken the link between extraversion and positive affect. This is because individuals higher in extraversion engage in more social activities than those lower in extraversion, and social activity mediates the association between extraversion and positive affect (Lucas et al., 2008). Although the direct effect of extraversion on positive affect remained after controlling for social activity (Lucas et al., 2008), it is likely that this effect would be diminished during the pandemic. Indeed, though extraversion was significantly associated with SWB during the pandemic (Anglim & Horwood, 2021; Kohut et al., 2021), this extraversion-positive affect relationship was attenuated as compared to prepandemic (Anglim & Horwood, 2021). Gubler et al. (2021) also found that associations of extraversion with well-being and loneliness were weak during the pandemic, suggesting that restricting social activities weakens the positive link between extraversion and well-being.

1.1 | The present research

The COVID-19 pandemic hit Singapore in late January 2020, and by end April, the total number of infected cases had reached 16,169, with a reported prevalence rate of 0.28% (Ministry of Health Singapore, 2021). A lockdown (termed the "circuit breaker") was implemented from April to July 2020, though the prevalence rate continued to increase, reaching 0.92% in late July and stabilizing around 1.00% from August to December 2020.
(Ministry of Health Singapore, 2021). Various measures such as work-from-home and home-based learning were also implemented throughout 2020. Although the total number of infections reached 58,599 by end December, the total number of deaths due to COVID-19 was 29 for the whole year. Compared to the COVID-19 death toll elsewhere (e.g., the United States) (Bacon et al., 2020), Singapore's fatality rate was remarkably low. Nevertheless, the economic repercussions of the pandemic were still severe—the circuit breaker resulted in a significant contraction of the economy, and Singapore's GDP growth forecast for 2020 was downsized to “−7.0 per cent to −4.0 per cent” (Saw et al., 2020). Even after the circuit breaker ended, stringent social distancing measures remained in place. The pandemic has thus been a massive disruption to daily lives, in particular due to social distancing which has resulted in a certain degree of social isolation for some (Ko & Kang, 2020).

This study assessed well-being in Singapore at two time points postcircuit breaker—1 month (baseline) and 5 months (Wave 2) after the circuit breaker ended. It measured both SWB (life satisfaction, global happiness, positive feelings, and negative feelings) and PWB (as assessed by whether respondents’ psychological needs for autonomy, mastery, respect, and social relatedness were fulfilled). The present research possessed several strengths. First, unlike most previous studies that examined only one or two components of SWB (e.g., life satisfaction or positive affect), this study examined various facets of well-being. It utilized multiple indicators, examining different components of both SWB and PWB. Second, data from the prepandemic period for these same measures were available, enabling us to compare how well-being had changed from the prepandemic to the pandemic period. Finally, the present study consisted of two waves of data—the first wave was conducted 1 month after the lockdown ended and the second wave was conducted 4 months after the first wave, when restrictions had eased considerably. This enabled us to track how people's well-being would change over a more prolonged period.

The first aim of this study was to examine whether the pandemic had adversely affected the well-being of residents in Singapore, and if so, to determine specifically which components of well-being were affected. In view of previous research highlighting the importance of social relationships and the detrimental effects of social isolation, we hypothesized that well-being during the pandemic would be lower than before the pandemic. Specifically, respondents would have lower SWB (on all components) and PWB (i.e., lower autonomy, mastery, respect, and social support) in the baseline assessment compared to pre-COVID-19. Our second hypothesis posited that respondents would recover in subjective and PWB over the 4-month period, although they might not have fully returned to prepandemic levels. That is, scores in Wave 2 would be lower (although perhaps not significantly) than scores on similar measures from the pre-COVID period. This is because SWB is strongly influenced by biological factors and is relatively stable over time and consistent across situations (Diener & Lucas, 1999). The set point theory posits that genes determine a large percentage of one’s happiness (Lyubomirsky et al., 2005). Heritability and twin studies provide further support suggesting that the genetic influences on the happiness set point can be predominantly attributed to stable personality traits (e.g., Steel et al., 2008; Weiss et al., 2008). These theories suggest that although SWB may decline in the short term due to the impact of COVID-19, the decrease may not be substantial or lasting. Likewise, as the fulfillment of one’s potentials and psychological needs would occur more slowly over time, PWB should be relatively stable.

The second aim of this study was to determine whether established key determinants of SWB—personality traits, financial satisfaction, health satisfaction, and psychological needs/well-being—would still be important predictors in times of a pandemic. Neuroticism and extraversion are closely related to SWB (Anglim et al., 2020; Steel et al., 2008). They were still strong predictors of SWB during the pandemic, although the extraversion–SWB associations became weaker (Anglim & Horwood, 2021; Gubler et al., 2021). Thus, our third hypothesis was that neuroticism would strongly predict all components of SWB. Extraversion would also significantly predict SWB although the associations may be weak. Given that financial satisfaction is associated with greater SWB (Ng & Diener, 2014) and that financial difficulties during the pandemic had a negative impact on well-being (Galanza et al., 2021), we also hypothesized that satisfaction with one's financial situation would predict greater SWB, especially in this climate of economic uncertainty. As SWB is closely linked to health outcomes (Diener et al., 2017).
while the constant news coverage of the global pandemic may increase the salience of the importance of health, our next prediction was that satisfaction with one’s health would predict greater SWB. Finally, we hypothesized that PWB (as assessed by the fulfillment of the psychological needs of autonomy, social support, respect, and mastery) would be positively associated with SWB.

2 | METHOD

2.1 | Sample and procedure

Respondents from a sampling frame of random household units obtained from the Department of Statistics (DOS), Singapore, and comprising at least one Singapore citizen or permanent resident aged 21 and above in the household were invited to participate in the online survey. The survey assessed respondents’ personality, well-being, and satisfaction with important life domains. The baseline survey and Wave 2 were administered in August 2020 and December 2020, respectively. The baseline survey consisted of a personality scale and sociodemographic measures, while measures of SWB, PWB, and satisfaction with life domains were included in both the baseline and Wave 2 surveys. Informed consent was obtained from all respondents. A total of 999 respondents\(^1\) (48.7% females and 43.4% males, gender data missing for 78; mean age = 43.37, SD\(_{age} = 12.75\)) and 232 respondents\(^2\) (52.6% females and 46.1% males, gender data missing for 3; mean age = 42.89, SD\(_{age} = 12.80\)) completed the baseline and Wave 2 surveys, respectively.

Data for the prepandemic period were obtained from a 2016 study involving a nationally representative sample from Singapore (see Ng et al., 2019, for further details). The current study drew on the SWB and PWB data from the 2016 survey. That survey was administered from the last quarter of 2015 to the last quarter of 2016. In total, 507 respondents (50.7% females and 49.3% males; mean age = 43, SD\(_{age} = 13.71\)) completed the 2016 survey.

2.2 | Measures

2.2.1 | SWB

SWB comprises cognitive and affective facets—the cognitive facet reflects a global evaluation of one’s life, whereas the affective facet refers to the frequency or intensity of experiencing pleasant and unpleasant emotions (Diener et al., 1999). Both the 2020 and 2016 surveys assessed three components of SWB—life satisfaction, positive feelings, and negative feelings. Life satisfaction assessed how satisfied respondents were with their lives as a whole, on a scale ranging from 1 (completely dissatisfied) to 10 (completely satisfied). A second indicator of life satisfaction (Ladder)—Cantril’s Self-Anchoring Striving Scale (Cantril, 1965), which is commonly used in international surveys such as the Gallup World Poll and assesses one’s global, cognitive evaluation of one’s life as a whole, was also included. Respondents rated their current life on a ladder scale, from 0 (worst possible life) to 10 (best possible life). Finally, an indicator of global SWB that assessed respondents’ global affective state by asking them to evaluate how happy they were (1 = not at all happy; 4 = very happy) was included too.

\(^1\)The demographic characteristics of the 999 respondents in this sample (median age = 42 years; 57.7% married and 42.3% single/widowed/divorced/separated, marital status not reported for 73; 77.8% Chinese, 4.8% Malay, 6.5% Indian, 3.2% Others, ethnicity not reported for 77) matched those of Singapore’s resident population in 2020 closely (median age = 41.5 years; 51.1% females and 48.9% males; 58.8% married and 41.2% single/widowed/divorced/separated: 74.3% Chinese, 13.5% Malay, 9.0% Indian, and 3.2% Others), indicating that the sample was representative.

\(^2\)The demographic characteristics of the remaining 232 respondents in Wave 2 (median age = 41; 52.2% married and 44.0% single/widowed/divorced/separated, marital status not reported for 9; 81.5% Chinese, 6.5% Malay, 4.7% Indian, 2.6% Others, ethnicity not reported for 11) were similar to those of the full sample.
The affective component comprises positive and negative feelings. Using a 5-point scale (1 = very rarely or never; 3 = sometimes; 5 = very often or always), respondents rated the extent to which they experienced these positive (happy, interested, joyful, contented, loving, and delighted) and negative (sad, afraid, worried, angry, irritable, and disappointed) emotions. The 2016 survey assessed how much respondents experienced these feelings over the past 4 weeks, while the 2020 survey assessed how much they experienced the feelings over the past week. The positive feelings (PF) and negative feelings (NF) scores were derived by averaging the ratings of their corresponding items (PF: Cronbach’s α = 0.89; NF: Cronbach’s α = 0.85).

2.2.2 | PWB

Indicators of PWB assessed in the 2016 and 2020 surveys included autonomy, social support, respect, and mastery. Autonomy asked respondents the extent to which they felt they had freedom of choice and control over the way their lives turned out, using a 1 (no choice at all) to 10 (a great deal of choice) scale. Social support assessed whether respondents had relatives or friends they could count on (whenever needed [2016 survey], or during the circuit breaker period [2020 survey]). As a measure of respect, respondents indicated whether they were treated with respect the previous day. Mastery assessed whether respondents learned or did something interesting the previous day. Responses to the latter three indicators were coded on a dichotomous scale, with 1 for "yes," and 0 for "no."

2.2.3 | Personality traits

To assess the Big Five (neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness), a 50-item inventory from the International Personality Item Pool was utilized. Using a 5-point scale (1 = very inaccurate; 5 = very accurate), respondents indicated how accurately each statement (e.g., "often feel blue," "make friends easily") best described them. This study examined only neuroticism and extraversion. Each trait was assessed by 10 items (neuroticism: Cronbach’s α = 0.87; extraversion: α = 0.87).

2.2.4 | Assessment of health and financial domains

A subjective indicator of perceived physical health, asking respondents whether they were satisfied with their personal health (1 = satisfied; 0 = dissatisfied) was obtained. The state of one’s financial situation was assessed by two indicators. The objective measure of financial situation was based on the respondent’s monthly household income in Singapore dollars, using income brackets (1 = <$1000; 2 = $1000–$1999; 3 = $2000–$2999; 4 = $3000–$3999; 5 = $4000–$4999; 6 = $5000–$5999; 7 = $6000–$6999; 8 = $7000–$7999; 9 = $8000–$8999; 10 = $9000–$9999; 11 = $10,000–$11,999, 12 = $12,000–$14,999; 13 = $15,000 and above). Using the midpoint of each income bracket, we estimated respondents' monthly household income. For the highest income bracket, we obtained an upper estimate of $23,730.5 from household income data (DOS, 2020), which yielded the midpoint of $19,365. Respondents’ satisfaction with the financial situation of their household, from 1 (completely dissatisfied) to 10 (completely satisfied), provided a subjective indicator of the financial domain.

The 2016 affect items assessed how respondents felt over the past 4 weeks, which pertained to their feelings more generally. However, the 2020 affect items provided a specific timeframe (i.e., the past week) that respondents could anchor their feelings on.
3 | RESULTS

Table 1 presents the basic descriptive statistics and the skewness and kurtosis indices. As shown, at both baseline and Wave 2, residents in Singapore had moderately high levels of SWB (life satisfaction, global happiness, positive feelings, and low negative feelings), despite the COVID-19 pandemic and social distancing measures. Respondents also reported high PWB—they had moderately high levels of autonomy over their lives, most felt that they were respected and had others to count on, and the majority felt a sense of mastery. Their assessments of important life domains were favorable too—they reported relatively high financial satisfaction, and the majority was satisfied with their health. Therefore, residents in Singapore still fared well in their SWB, PWB, and important life domains (health and financial) in 2020 despite the pandemic. The correlations between SWB and the key predictors for both waves (2020) are presented in Table 2. These zero-order correlations showed that lower neuroticism and higher extraversion were associated with greater SWB and PWB, for all indicators. Health and financial satisfaction were positively associated with SWB and PWB. People earning higher incomes reported greater SWB and had more autonomy and social support.

3.1 | Comparisons with 2016 data

To test the first hypothesis, we conducted independent-samples t-test to compare baseline well-being levels in 2020 with those in 2016. As multiple comparisons were made (with five indicators for SWB and four indicators for PWB), Bonferroni correction was applied. Thus, the resulting significance cut-off was set at 0.05/5 = 0.01 for SWB.

| Variable | Baseline: M (SD) | Baseline: skewness (SE) | Baseline: kurtosis (SE) | Wave 2: M (SD) | Wave 2: skewness (SE) | Wave 2: Kurtosis (SE) |
|----------|------------------|------------------------|------------------------|---------------|-----------------------|----------------------|
| 1. Ladder | 6.17 (1.71)      | −0.60 (0.08)           | 0.70 (0.16)            | 6.43 (1.77)   | −0.76 (0.16)          | 0.62 (0.32)          |
| 2. PF     | 3.32 (0.64)      | −0.06 (0.08)           | 0.13 (0.16)            | 3.46 (0.67)   | −0.35 (0.16)          | −0.27 (0.32)         |
| 3. NF     | 2.74 (0.67)      | 0.12 (0.08)            | 0.13 (0.16)            | 2.64 (0.76)   | 0.23 (0.16)           | 0.07 (0.32)          |
| 4. LS     | 6.50 (1.78)      | −0.48 (0.08)           | 0.09 (0.16)            | 6.82 (1.70)   | −0.62 (0.16)          | 0.56 (0.32)          |
| 5. Happy  | 2.84 (0.65)      | −0.56 (0.08)           | 0.86 (0.16)            | 2.88 (0.63)   | −0.63 (0.16)          | 1.24 (0.32)          |
| 6. Respect| 0.87 (0.34)      | −2.16 (0.08)           | 2.65 (0.17)            | 0.93 (0.25)   | −3.54 (0.18)          | 10.64 (0.36)         |
| 7. Mastery| 0.68 (0.47)      | −0.76 (0.08)           | −1.42 (0.16)           | 0.69 (0.46)   | −0.85 (0.17)          | −1.29 (0.35)         |
| 8. Social | 0.77 (0.42)      | −1.27 (0.09)           | −0.39 (0.17)           | 0.78 (0.42)   | −1.36 (0.17)          | −0.16 (0.34)         |
| 9. Autonomy| 6.57 (1.85)     | −0.47 (0.08)           | 0.26 (0.16)            | 6.85 (1.71)   | −0.76 (0.18)          | 0.84 (0.35)          |
| 10. Health| 0.72 (0.45)      | −0.97 (0.08)           | −1.06 (0.17)           | 0.70 (0.46)   | −0.87 (0.17)          | −1.25 (0.34)         |
| 11. FS    | 6.15 (2.18)      | −0.49 (0.08)           | −0.10 (0.16)           | 6.35 (2.11)   | −0.66 (0.17)          | 0.02 (0.33)          |
| 12. Incomea| 3.72 (0.41)     | −0.76 (0.08)           | 0.33 (0.17)            | —             | —                     | —                    |
| 13. Neuroa| 2.59 (0.73)      | 0.13 (0.08)            | −0.25 (0.16)           | —             | —                     | —                    |
| 14. Extraa| 3.00 (0.68)      | −0.11 (0.08)           | 0.10 (0.16)            | —             | —                     | —                    |

Abbreviations: Extra, extraversion; FS, financial satisfaction; Happy, global happiness; Income, log income; LS, life satisfaction; Neuro, neuroticism; Social, social support.

*aIncome, N, and E are measured at baseline only (and not at Wave 2).
### Table 2: Zero-order correlations of key variables

| Variable | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  |
|----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1. Ladder| –   | 0.73*** | -0.065*** | 0.76*** | 0.54*** | 0.10 | 0.25*** | 0.14* | 0.66*** | 0.37*** | 0.73*** | 0.27*** | -0.58*** | 0.35*** |
| 2. PF   | 0.65*** | –   | -0.68*** | 0.71*** | 0.58*** | 0.13 | 0.34*** | 0.17* | 0.61*** | 0.32*** | 0.62*** | 0.16* | -0.64*** | 0.44*** |
| 3. NF   | -0.51*** | -0.49*** | –   | -0.64*** | -0.55*** | -0.09 | -0.24*** | -0.19** | -0.54*** | -0.37*** | -0.55*** | -0.08 | 0.67*** | -0.24*** |
| 4. LS   | 0.74*** | 0.70*** | -0.52*** | –   | 0.60*** | 0.08 | 0.25*** | 0.15* | 0.54*** | 0.32*** | 0.65*** | 0.18** | -0.53*** | 0.33*** |
| 5. Happy| 0.59*** | 0.56*** | -0.43*** | 0.67*** | –   | 0.03 | 0.21** | 0.09 | 0.36*** | 0.28*** | 0.48*** | 0.07 | -0.37*** | 0.31*** |
| 6. Respect | 0.25*** | 0.25*** | -0.27*** | 0.28*** | 0.17*** | –   | -0.02 | 0.02 | 0.26*** | -0.02 | 0.17* | 0.12 | -0.16* | 0.11 |
| 7. Mastery | 0.24*** | 0.34*** | -0.17*** | 0.25** | 0.22*** | 0.15*** | –   | 0.18* | 0.27*** | 0.32*** | 0.22** | -0.002 | -0.23*** | 0.29*** |
| 8. Social | 0.24*** | 0.27*** | -0.22*** | 0.20*** | 0.16*** | 0.11*** | 0.07 | –   | 0.12 | 0.11 | 0.19** | 0.19** | -0.25*** | 0.18* |
| 9. Autonomy | 0.53*** | 0.51*** | -0.38*** | 0.52*** | 0.38*** | 0.25*** | 0.27*** | 0.29*** | –   | 0.26*** | 0.57*** | 0.18* | -0.54*** | 0.36*** |
| 10. Health | 0.30*** | 0.35*** | -0.27*** | 0.32*** | 0.27*** | 0.20*** | 0.16*** | 0.19*** | 0.32*** | –   | 0.42*** | 0.10 | -0.29*** | 0.24*** |
| 11. FS   | 0.59*** | 0.50*** | -0.38*** | 0.53*** | 0.41*** | 0.21*** | 0.12*** | 0.30*** | 0.55*** | 0.29*** | –   | 0.32*** | -0.50*** | 0.27*** |
| 12. Income³ | 0.20*** | 0.08**** | -0.11*** | 0.14*** | 0.10*** | 0.03 | 0.04 | 0.18*** | 0.21*** | 0.03 | 0.35*** | –   | -0.14* | 0.20** |
| 13. Neuro³ | -0.58*** | -0.59*** | 0.65*** | -0.54*** | -0.42*** | -0.26*** | -0.21*** | -0.26*** | -0.52*** | -0.33*** | -0.44*** | -0.12*** | –   | –   |
| 14. Extra⁰ | 0.27*** | 0.35*** | -0.19*** | 0.24*** | 0.18*** | 0.11*** | 0.22*** | 0.16*** | 0.31*** | 0.15*** | 0.15*** | 0.04 | -0.37*** | –   |

Note: Intercorrelations for baseline (and Wave 2) are presented below (and above) the diagonal respectively.

Abbreviations: Extra, extraversion; FS, financial satisfaction; Happy, global happiness; Income, log income; LS, life satisfaction; Neuro, neuroticism; Social, social support.

* p < 0.05; ** p < 0.01; *** p ≤ 0.001.

³Income, N, and E, are measured at baseline only (and not at Wave 2).
and at $0.05/4 = 0.0125$ for PWB. The analyses showed that respondents had significantly lower well-being after the circuit breaker, as compared to pre-pandemic in 2016. They reported lower SWB on all five indicators and lower PWB in terms of lower autonomy and social support, relative to 2016, though there were no significant differences in respect or mastery (see Table 3).

To examine the second hypothesis, we compared the 2020 Wave 2 data with 2016 data, applying the same Bonferroni corrections. The analyses showed that by December 2020, respondents had recovered in well-being, and showed levels of SWB and PWB similar to those observed pre-pandemic. Specifically, respondents in 2020 (Wave 2) and 2016 did not differ significantly in SWB and PWB on all indicators (life satisfaction, Ladder, positive feelings, negative feelings, autonomy, respect, and mastery), except for global happiness and social support. Global happiness and social support in December 2020 were still significantly lower than those observed in 2016 (see Table 3).

### 3.2 Predictors of well-being

Preliminary regression analyses were conducted for each SWB indicator, using personality traits (neuroticism and extraversion), assessment of important life domains (health and financial satisfaction, and log income), PWB (autonomy, social support, respect, and mastery), and sociodemographic characteristics (age and gender) as predictors. Social support and gender had no significant effects for all the well-being indicators, while age and income had no significant effects for most of the well-being indicators. Thus, these four variables were dropped from the final analyses.

The final baseline regression analyses showed that personality—specifically neuroticism—was an important predictor of SWB, for all five indicators (see Table 4). Those who were higher in neuroticism had lower SWB (i.e., lower life satisfaction, Ladder, global happiness, and positive feelings, and higher negative feelings). Extraversion however, was a significant predictor of only positive feelings, but not any of the other four SWB indicators. Higher levels of extraversion predicted more positive feelings. Satisfaction with one’s financial (but not health) domain was also an important predictor of SWB. Those who were more satisfied with their financial situation reported higher SWB on all five indicators. Satisfaction with health predicted greater positive feelings, but surprisingly, did not predict the other four SWB indicators. In terms of PWB, having more autonomy and mastery was associated with higher life satisfaction and Ladder, and more positive feelings. Higher levels of mastery also predicted greater global happiness. Being respected was associated with greater life satisfaction and lower negative feelings. Together, these seven predictors accounted for considerable variance in SWB (for all five indicators; see Table 4 for $R^2$ values).

At Wave 2, neuroticism and financial satisfaction were still significant predictors of SWB. Lower levels of neuroticism and higher levels of financial satisfaction were associated with greater SWB (i.e., higher life satisfaction, Ladder, and global happiness, more positive feelings, and lower negative feelings), although the neuroticism-global happiness association was not significant (see Table 5). Similar to the baseline analyses, having more autonomy and mastery predicted greater positive feelings. Greater autonomy was also associated with higher life evaluation (Ladder). Extraversion, health satisfaction, and respect, however, did not significantly predict any of the SWB indicators at Wave 2. As a whole, the seven predictors explained substantial variance in SWB at Wave 2 (see Table 5 for $R^2$ values).

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*Age was significant only for the Ladder indicator (both baseline and Wave 2), while income was significant only for the Positive Feelings indicator (baseline only). The preliminary analyses that included both age and income showed the same patterns of results as the final analyses (without the two variables); thus, only the final analyses are reported.*
TABLE 3  Comparisons of SWB and psychological well-being in 2020 and 2016

| Variable        | 2020 Baseline, M (SD) | 2016, M (SD) | 95% CI     | t   | df  | p   | 2020 Wave 2, M (SD) | 95% CI     | t   | df  | p   |
|-----------------|-----------------------|--------------|------------|-----|-----|-----|---------------------|------------|-----|-----|-----|
| Life satisfaction | 6.50 (1.78)           | 7.03 (1.63)  | [-0.71, -0.35] | -5.75 | 1101.84 | 0.000 | 6.82 (1.70)       | [-0.47, 0.05] | -1.60 | 729 | 0.111 |
| Global happiness | 2.84 (0.65)           | 3.14 (0.64)  | [-0.37, -0.24] | -8.63 | 1494 | 0.000 | 2.88 (0.63)       | [-0.36, -0.16] | -5.16 | 732 | 0.000 |
| Positive feelings | 3.32 (0.64)           | 3.53 (0.63)  | [-0.28, -0.14] | -6.03 | 1503 | 0.000 | 3.46 (0.67)       | [-0.16, 0.04] | -1.24 | 736 | 0.214 |
| Negative feelings | 2.74 (0.67)           | 2.55 (0.70)  | [0.12, 0.27]  | 5.23 | 1500 | 0.000 | 2.64 (0.76)       | [-0.02, 0.21] | 1.66 | 737 | 0.098 |
| Ladder          | 6.17 (1.71)           | 6.50 (1.63)  | [-0.51, -0.15] | -3.54 | 1494 | 0.000 | 6.43 (1.77)       | [-0.33, 0.19] | -0.52 | 734 | 0.602 |
| Autonomy        | 6.57 (1.85)           | 6.91 (1.93)  | [-0.55, -0.14] | -3.30 | 1407 | 0.001 | 6.85 (1.71)       | [-0.38, 0.25] | -0.41 | 692 | 0.684 |
| Respect         | 0.87 (0.34)           | 0.90 (0.31)  | [-0.06, 0.01]  | -1.62 | 1150.25 | 0.110 | 0.93 (0.25)       | [-0.01, 0.08] | 1.71 | 394.84 | 0.087 |
| Social support  | 0.77 (0.42)           | 0.89 (0.31)  | [-0.16, -0.08] | -6.05 | 1276.15 | 0.000 | 0.78 (0.42)       | [-0.18, -0.05] | -3.44 | 300.64 | 0.001 |
| Mastery         | 0.68 (0.47)           | 0.62 (0.49)  | [0.01, 0.11]  | 2.14 | 1017.96 | 0.033 | 0.69 (0.46)       | [-0.01, 0.15] | 1.84 | 370.97 | 0.066 |

Abbreviations: SD, standard deviation; SWB, subjective well-being.
TABLE 4 Regression analyses for the different SWB indicators at baseline

| Predictors | Baseline life satisfaction |  | Baseline ladder |  | Baseline positive feelings |  |
|------------|----------------------------|---|----------------|---|---------------------------|---|
|            | B (SE)                     | β  | t   | B (SE) | 95% CI        | β  | t   | B (SE) | 95% CI        | β  | t   |
| Intercept  | 4.89 (0.50)                | 9.80 | 4.80 (0.44) | [3.94, 5.66] | 10.95 | 2.74 (0.17) | [2.40, 3.08] | 15.87 |
| Neuro      | −0.65 (0.09)               | −0.27*** | −7.62 | −0.67 (0.08) | [−0.82, −0.53] | −0.30*** | −9.00 | −0.27 (0.03) | [−0.33, −0.21] | −0.32*** | −9.23 |
| Extra      | 0.04 (0.08)                | 0.02 | 0.51 | 0.08 (0.07) | [−0.06, 0.22] | 0.03 | 1.14 | 0.12 (0.03) | [0.06, 0.17] | 0.12*** | 4.09 |
| Health     | 0.24 (0.12)                | 0.06† | 1.93 | 0.04 (0.11) | [−0.18, 0.25] | 0.01 | 0.34 | 0.09 (0.04) | [0.01, 0.17] | 0.06* | 2.11 |
| FS         | 0.23 (0.03)                | 0.28*** | 8.08 | 0.30 (0.03) | [0.25, 0.35] | 0.39*** | 12.06 | 0.07 (0.01) | [0.05, 0.09] | 0.23*** | 6.93 |
| Autonomy   | 0.14 (0.04)                | 0.14*** | 3.87 | 0.09 (0.03) | [0.03, 0.16] | 0.10** | 2.90 | 0.03 (0.01) | [0.01, 0.06] | 0.09* | 2.56 |
| Respect    | 0.48 (0.16)                | 0.09** | 2.98 | 0.21 (0.14) | [−0.07, 0.49] | 0.04 | 1.50 | 0.09 (0.06) | [−0.02, 0.20] | 0.05 | 1.62 |
| Mastery    | 0.34 (0.12)                | 0.09** | 2.91 | 0.30 (0.10) | [0.10, 0.50] | 0.08** | 2.97 | 0.24 (0.04) | [0.16, 0.31] | 0.17*** | 5.89 |
| N          | 713                        | 714 | 715 | 0.42 | 0.49 | 0.46 | 0.41 | 0.48 | 0.45 |

(Continues)
| Predictors | Baseline negative feelings | | | | Baseline global happiness | | | |
|---|---|---|---|---|---|---|---|---|
| | B (SE) | 95% CI | β | t | | B (SE) | 95% CI | β | t |
| N | 714 | | | | 714 | | | |
| $R^2$ | 0.45 | | | 0.24 | | | | |
| Adj $R^2$ | 0.44 | | | 0.24 | | | | |

**Note:** Adj $R^2$ values are adjusted for the number of predictors.

**Abbreviations:** Extra, extraversion; FS, financial satisfaction; Neuro, neuroticism.

$p < 0.10$.

*p < 0.05. **p < 0.01. ***p < 0.001.
| Predictors | Wave 2 life satisfaction | Wave 2 ladder | Wave 2 positive feelings |
|------------|-------------------------|---------------|-------------------------|
|            | B (SE)                  | 95% CI        | β t                     | B (SE)                  | 95% CI        | β t                     |
| Intercept  | 4.21 (1.00)             | [2.45, 6.18]  | 4.23 2.58 (0.85)        | 95% CI        | 2.65 (0.35) | -0.28 (0.05) [-0.39, -0.18] | -0.35*** -5.26 |
| Neuro      | -0.31 (0.15)            | [-0.61, -0.01] | -0.15* -2.01            | -0.34 (0.13) | [-0.60, -0.08] | -0.16* -2.56 | 0.09 (0.06) [-0.02, 0.20] | 0.10 1.59 |
| Extra      | 0.18 (0.16)             | [-0.13, 0.48] | 0.08 1.13               | 0.13 (0.13) | [-0.14, 0.39] | 0.05 0.94     | 0.09 (0.06) [-0.02, 0.20] | 0.10 1.59 |
| Health     | -0.18 (0.25)            | [-0.67, 0.31] | -0.05 -0.74             | -0.06 (0.22) | [-0.49, 0.36] | -0.02 -0.29 | -0.09 (0.09) [-0.26, 0.09] | -0.06 -1.01 |
| FS         | 0.40 (0.06)             | [0.28, 0.53]  | 0.51*** 6.27            | 0.45 (0.06) | [0.34, 0.56] | 0.54*** 8.12 | 0.10 (0.02) [0.06, 0.15] | 0.32*** 4.52 |
| Autonomy   | 0.11 (0.08)             | [-0.06, 0.27] | 0.10 1.28               | 0.24 (0.07) | [0.09, 0.38] | 0.21*** 3.26 | 0.07 (0.03) [0.01, 0.13] | 0.15* 2.27 |
| Respect    | -0.67 (0.43)            | [-1.53, 0.18] | -0.10 -1.55             | -0.45 (0.36) | [-1.15, 0.25] | -0.07 -1.27 | 0.03 (0.15) [-0.27, 0.32] | 0.01 0.18 |
| Mastery    | 0.39 (0.24)             | [-0.09, 0.86] | 0.11 1.61               | 0.34 (0.21) | [-0.08, 0.75] | 0.09 1.61 | 0.26 (0.09) [0.10, 0.43] | 0.18** 3.10 |

| N          | 148                     | 150           | 149                      |
| R²         | 0.48                    | 0.65          | 0.60                     |
| Adj R²     | 0.46                    | 0.63          | 0.58                     |

| Predictors | Wave 2 negative feelings | Wave 2 global happiness |
|------------|--------------------------|-------------------------|
|            | B (SE)                  | 95% CI        | β t                     | B (SE)                  | 95% CI        | β t                     |
| Intercept  | 1.84 (0.40)             | [1.05, 2.64]  | 4.57 2.23 (0.44)        | [1.36, 3.11] | 5.05 |
| Neuro      | 0.49 (0.06)             | [0.37, 0.61]  | 0.56*** 7.85            | -0.11 (0.07) | [-0.24, 0.03] | -0.14 -1.55 |
| Extra      | 0.07 (0.06)             | [-0.06, 0.20] | 0.07 1.09               | 0.12 (0.07) | [-0.02, 0.26] | 0.14† 1.76 |
| Health     | -0.12 (0.10)            | [-0.32, 0.09] | -0.08 -1.13             | -0.01 (0.11) | [-0.23, 0.21] | -0.01 -0.10 |
| FS         | -0.06 (0.03)            | [-0.11, -0.01] | -0.16* -2.15            | 0.11 (0.03) | [0.06, 0.17] | 0.37*** 3.89 |
| Autonomy   | -0.04 (0.03)            | [-0.11, 0.03] | -0.08 1.16              | -0.01 (0.04) | [-0.08, 0.07] | -0.01 -0.16 |
| Respect    | 0.19 (0.17)             | [-0.15, 0.52] | 0.07 1.12               | -0.21 (0.18) | [-0.58, 0.15] | -0.09 -1.16 |
| Mastery    | -0.16 (0.10)            | [-0.35, 0.04] | -0.10 -1.57             | 0.11 (0.11) | [-0.10, 0.33] | 0.08 1.05 |

(Continues)
| Predictors | Wave 2 negative feelings |             |             | Wave 2 global happiness |             |             |
|------------|--------------------------|-------------|-------------|-------------------------|-------------|-------------|
|            | B (SE) 95% CI β t        | B (SE) 95% CI β t |
| N          | 150                      | 149         |
| $R^2$      | 0.54                     | 0.28        |
| Adj $R^2$  | 0.52                     | 0.25        |

Note: Adj $R^2$ values are adjusted for the number of predictors.
Abbreviations: Extra, extraversion; FS, financial satisfaction; Neuro, neuroticism.

* $p < 0.10$
* $p < 0.05$
** $p < 0.01$
*** $p < 0.001$
3.3 | General discussion

In summary, subjective and PWB in Singapore in 2020 were still relatively high despite the pandemic. Nevertheless, well-being had declined significantly as compared to the prepandemic period. Respondents reported lower SWB during the pandemic, for all SWB components measured using different indicators. They also experienced lower autonomy and social support. The decreased well-being may partly be due to the stress associated with the pandemic, for example, worries about COVID-19 infection, social isolation, and financial uncertainty. By December 2020, however, respondents’ well-being had recovered considerably. Compared to prepandemic levels, there were no significant differences in SWB or PWB, except in global happiness and social support. One explanation, as discussed earlier, is the relative stability and genetic bases of SWB. Hence, even though SWB may fluctuate or decline in response to the negative impact of the pandemic, people would eventually return to levels similar to their baseline. Another possible factor that could have aided in the recovery of Singapore residents’ well-being is the various policy initiatives such as the Resilience Budget, Solidarity Budget, and Fortitude Budget (totaling almost $90 billion), rolled out by the Singapore Government over the course of the pandemic to ease the financial burden on the populace. These budgets might have buffered the adverse financial impact of the pandemic to some extent.

Our analyses found that neuroticism and financial satisfaction were the two most consistent, key predictors of SWB during the pandemic. They were strongly related to all SWB components, regardless of the indicator used. This held for both baseline and Wave 2 assessments. These findings accorded with what previous research has established— that neuroticism (Anglim et al., 2020; Steel et al., 2008) and financial satisfaction (Ng & Diener, 2014; Ng et al., 2019) are key predictors of SWB. Extraversion, however, was significantly related to only positive feelings, but not the other SWB components. This could be because the relations between extraversion and well-being may not be consistently strong across all countries and circumstances. For instance, a previous study in Singapore found that extraversion strongly predicted only positive feelings, but not life satisfaction or negative feelings (Ng et al., 2019). Similarly, although meta-analyses (from prepandemic circumstances) have shown that extraversion is closely related to different SWB components (i.e., life satisfaction, positive feelings, and negative feelings) (Anglim et al., 2020; Steel et al., 2008), other studies have found that the associations between personality (in particular, extraversion) and well-being were weaker during the pandemic (Anglim & Horwood, 2021). For instance, extraversion was not significantly correlated with well-being during the pandemic (Gubler et al., 2021), even though neuroticism remained strongly related to lower well-being. Indeed, the pandemic-era studies found that the associations of neuroticism with SWB generally remained robust (Gubler et al., 2021; Kohút et al., 2021), even when compared to the prepandemic period (Anglim & Horwood, 2021). This suggests that neuroticism remains a key determinant of SWB despite the pandemic, which supports the temperament perspective—that is, the strong neuroticism-negative affect relation stems largely from the biological basis of neuroticism (Gross et al., 1998). Our findings are consistent with the conclusion that a large part of individual differences in SWB are due to personality differences, which in turn can be attributed to genetic bases (Weiss et al., 2008).

Given the severe financial impact of the pandemic, on both global economies and individuals, it is unsurprising that how satisfied people are with their financial situation would be vital to their well-being. Like most countries, Singapore’s economy took a heavy hit due to the lockdown measures and border closures. Several individuals lost their jobs or received pay cuts, while others faced job uncertainty or could not find employment. Since financial difficulties due to the pandemic were linked to greater psychological distress (Aruta et al., 2021), the importance of financial satisfaction observed here aligns not only with previous research, but with the current economic situation too.

Satisfaction with one’s health was posited to predict SWB as the pandemic has underscored the paramount importance of health. Surprisingly, health satisfaction only predicted positive feelings but not any of the other four SWB indicators. It is possible that the health satisfaction measure used in this study, with its dichotomous response format, failed to capture the effect of health on other SWB components. Alternatively, it is also possible that during the pandemic, one’s actual health status (as assessed by an objective health indicator) or physical health behaviors,
rather than perceived health, would influence SWB more strongly. This also accords with findings showing that perceived health (as assessed by the degree that COVID-19 was perceived as a health threat) did not significantly predict positive or negative affect (Kohút et al., 2021). Future research should thus include both objective and subjective indicators of health, and measures of health behaviors.

Another unexpected finding was that social support did not predict any of the five indicators of SWB. In view of the importance of social relationships for well-being (Diener et al., 2010; Rohrer et al., 2018), we had expected social support to be an important determinant of SWB. However, it is possible that technological tools (e.g., Zoom) that have facilitated virtual social interactions have mitigated the effects of the social distancing measures, enabling the maintenance of social relationships despite curtailed physical social interactions. This may explain why although social support during the pandemic (for both waves) was significantly lower than in the prepandemic period, the majority of the respondents (77% Baseline and 78% Wave 2) still felt that they had people to count on in times of need. Nonetheless, fulfilling other aspects of psychological needs remained central to one’s SWB. Having autonomy and mastery was closely related to SWB, although not for all forms of SWB.

3.4 Limitations and conclusion

One limitation of the current study was the measures used to assess the key variables. PWB, health and financial satisfaction, and certain SWB variables (life satisfaction, Ladder, and global happiness) were assessed using single-item measures. Although single-item measures are reliable (Lucas & Donnellan, 2012), they may underestimate true effect sizes. Moreover, many of these variables utilized a dichotomous scale. Using a dichotomous scale lowers the sensitivity of the items and may yield smaller effects than those obtained with a continuous scale. Nevertheless, dichotomous measures are unlikely to produce spurious effects. The purpose of using the single-item or dichotomous measures was to enable comparisons with prepandemic data, as those same measures were used in a previous local study (Ng et al., 2019). Furthermore, as most of these measures were used in international surveys (e.g., Gallup World Poll and World Values Survey) (Ng & Diener, 2014), comparisons could be made between Singapore and the international data. Finally, using single-item and dichotomous measures shortened the time needed to complete the survey, which could improve the response rate.

Another limitation is that our two-wave study had a high attrition rate (Wave 2 response rate = 23.2%) and spanned only 4 months. Nonresponse bias, however, should not be an issue, as the sociodemographic characteristics of the remaining Wave 2 respondents were very similar to those of the full sample (see Footnote 2). Further analyses confirmed that participants who dropped out did not differ from those who continued as they did not differ significantly in any of the key variables at baseline.

Although well-being at Wave 2 had largely recovered to prepandemic levels, suggesting that the deleterious effects of the pandemic on well-being are not lasting, a longer-term longitudinal study with a larger sample size is necessary before the findings can be generalized. Was the improved well-being merely in response to the improved situation in Singapore in December 2020 (with the pandemic being largely under control at that time), or did it reflect shifts in adaptation level and people's well-being improved as they adapted to the new COVID-norm? Our study further highlighted that the different SWB components were all strongly influenced by neuroticism. The importance of the dispositional factor—neuroticism, together with the finding that people quickly recovered to their baseline well-being to a large extent, suggest that even a strongly negative situation like the pandemic does not exert any lasting detrimental effects on people's mental health. This implies that as people adapt to the pandemic, despite the initial deterioration in mental health (e.g., Fisher et al., 2020; Liang et al., 2020), their well-being would improve eventually. It would be interesting to examine the reasons for the recovery in well-being. Do individuals return to their threshold well-being levels to a large degree even if there is not complete adaptation, because SWB is a stable construct that is strongly influenced by disposition? Or does resilience or adaptation play a role too? Future studies can delve deeper into these possible mechanisms.
Finally, our findings underscoring the importance of financial satisfaction for well-being suggest that the government policies that have been rolled out to buffer the impact of the pandemic are relevant. As resources are not finite, focusing primarily on economic policies in the immediate aftermath of the pandemic, rather than on policies targeting psychological or social aspects, may be useful, as doing so yields immediate, tangible benefits. Nonetheless, over the long-term, policies promoting psychosocial factors should not be neglected. As evident in the study, meeting one's psychological needs for autonomy, mastery, and respect remains important for SWB.

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CONFLICT OF INTERESTS
The authors declare that there are no conflict of interests.

DATA AVAILABILITY STATEMENT
The data that support the findings of this study are not publicly available. Restrictions apply to the availability of these data. Data may be available from the corresponding author (W. Ng) upon request, with the permission of Singapore University of Social Sciences.

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