



The effects of the COVID-19 crisis on the subjective well-being of the Israeli population—monitored phase by phase

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Accepted: 5 March 2021 / Published online: 11 March 2021

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Abstract

The paper examined the effect of the pandemic outbreak of COVID-19 on the cognitive and affective components of subjective well-being (SWB) over time in Israel. Just before the first verified patient, we ran a survey of the general population that included questions concerning both components of SWB, self-rated health, income satisfaction, and other socio-demographic aspects. The same survey among different respondents from the same population during the lockdown period when no exit strategy had been conveyed, and for the third time when the exit strategy was publicized and began to be implemented. The findings show that the cognitive component of SWB, as measured by Cantril's Ladder, remained stable over the long term. The average respondent reported unchanged life evaluation even when the individual's negative feelings rose by 52%, and positive feelings fell by 16%. We show evidence for a structural change in the weighting of feelings and self-rated health in life satisfaction function.

Keywords Global life evaluation · Feelings · Structural change · Subjective well-being

The pandemic outbreak of COVID-19 presents an opportunity to investigate in a case study how subjective well-being (SWB)—people's evaluations of their life quality—is affected by global health and economic crises. Whereas scientists have predicted an increasing frequency of pandemics (Wolfe, 2011), it has been recognized that the current understanding of the effect of such a phenomenon on people's SWB is incomplete (Yang & Ma, 2020). A thorough inquiry should help delineate the effect of these crises on the two components of SWB: the cognitive judgments of life and the affective evaluations of positive and negative moods and emotions (Diener, 2000; Lucas et al., 1996). Although these components are related, “they are empirically separable and must be studied

individually to gain a complete picture of overall subjective well-being” (Diener & Lucas, 1999, p. 213).

What do we already know about the effect of the COVID-19 pandemic on people's SWB? There is evidence of a drop in the SWB's affective component, manifested in stress, confusion, and anger (Brooks et al., 2020; Yang & Ma, 2020). In a nationwide survey of the Chinese population, about 35% of the respondents experienced psychological distress, with females experiencing a stronger effect than males (Qiu et al., 2020). Unsurprisingly, individuals who stopped working reported worse mental and physical health conditions (Zhang et al., 2020). Another study, analyzing Google Trends, found a compelling increase in searches for loneliness, worry, and sadness, implying severe affective consequences of the lockdown (Brodeur et al., 2020).

These findings align with current knowledge. The affective component of emotions, which appear “in the guise of a perceived property of events or stimulus objects (‘pleasant stimulus,’ ‘horrible sight,’ ‘shocking news’)” (Frijda, 1999, p. 194), health concerns, income instability and increased mortality can be expected to increase negative emotions and decrease positive emotions. However, empirical evidence is lacking about how SWB's cognitive component is affected by pandemic conditions and by the exogenous change in people's negative and positive emotions. Investigating both components is essential, as emotional well-being and life evaluations were found to have different associations with various factors (such as with income, as suggested by Kahneman & Deaton, 2010).

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People's life evaluations may respond to such dramatic change in two contradictory modes. According to the first scenario, people's global life evaluations are expected to drop because they "reliably and validly reflect authentic differences in the ways people evaluate their lives, and the scores move in expected ways to changes in people's circumstances" (Diener et al., 2013, p. 507). People use their current mood as information to evaluate their life satisfaction (Diener et al., 2013; Schimmack et al., 2002a, b; Schwarz et al., 1987). When the same event (i.e., a health and economic crisis) impacts a large number of people in a nation, an increase in negative feelings can be expected to negatively affect the cognitive assessment of life (Diener et al., 2013).

In the second mode, the cognitive component would maintain its pre-crisis level due to its psychological and economic mechanisms. The *hedonic treadmill model* asserts that positive and adverse events temporarily affect life satisfaction, but individuals quickly adapt back to hedonic neutrality (see Discussion in Diener et al., 2006). Such adaptation relates to the economic perspective of producing well-being (Bruni, 2007; Dolan, 2014; Sherman et al., 2020). People would manage to produce long-term output levels (e.g., life satisfaction) by reorganizing the means of production. In other words, the weights of productive means would increase, whereas the weights of the less productive would decrease. The literature has demonstrated this manner of structural change through the weightings of various factors such as emotions and feelings (Bastian et al., 2014; Kuppens et al., 2008; Oishi et al., 2007; Schimmack et al., 2002a, b; Suh et al., 1998), good and bad information (Diener et al., 2002), social self-concept and academic test scores (Chang et al., 2003), employment (Boyce et al., 2010; Johansson et al., 2019; Powdthavee, 2014), and social capital (Elgar et al., 2011).

This paper seeks to investigate the response of people's SWB to the pandemic. Specifically, we pose two questions: First, how were the cognitive and affective components of SWB affected by different pandemic stages? Did both SWB components decline when the Israeli government declared a lockdown, and did both improve in response to information concerning an exit strategy, or were their responses contradictory? Second, how did changes in the affective component influence the cognitive appraisal of well-being?

This inquiry is critical for understanding how individuals cope with the short-term effects of the global crisis on their quality of life and the long-term consequences of the crisis on individuals and society. Previous studies have confirmed the objective benefits of SWB on major life domains such as health, longevity, income, labor productivity, and social behaviors (e.g., De Neve et al., 2013; Diener & Tay, 2017; Lyubomirsky et al., 2005); however, if people's SWB would worsen as the crisis worsens—this implies that at least some of these benefits would be converted into costs.

This study is the first to empirically examine phase by phase both the cognitive and affective components in individuals' life evaluation in response to changes in information and governmental decisions during the COVID-19 crisis.

Method

Sample

The study is based on a survey¹ administered by the Midgam Project, an Israeli online survey company that specializes in research surveys for the general population. Respondents were recruited² in three groups with comparable demographic features, as follows:

Group A (pre-crisis): This group comprised 735 respondents (mean age = 40.8, $SD = 11.1$, 52.9% females). They completed the survey between 24 February 2020 to 26 February 2020, before the Israeli Ministry of Health reported Israel's first COVID-19 patient—27 February 2020.³

Group B (during the lockdown): This group comprised 711 respondents (mean age = 41.4, $SD = 11.4$, 50.6% females) who completed the survey between 16 March 2020 (the day lockdown was declared) and 19 March 2020. At that time, 677 COVID-19 patients were reported in Israel. On 12 March 2020, the Israeli government declared the closing of schools and universities, public events were prohibited, and only 30% of the workforce were permitted to return to their workplaces.

Group C (after exit strategy announced): This group comprised 760 respondents (mean age = 41.8, $SD = 11.61$, 50.1% females) completed the survey between 22 April 2020 to 23 April 2020. At this measurement, 14,592 COVID-19 patients were reported in Israel (5334 of them recovered), and 191 had died. Following a total lockdown for 3 weeks, on 19 April, the government determined that the pandemic's peak had passed and announced an exit strategy, easing the lockdown.

¹ The questionnaire was approved by the ethics committee of the College of Management Academic Studies, Israel.

² The respondents were part of the pool of people in the company. There was no option to respond to the survey more than once. A link to the survey was sent to a pool of people in the age range of 18–70.

³ When the COVID-19 began spreading worldwide, we designed the survey, using the basic measure and planning to administer it as soon as possible. At the beginning, we didn't know how the pandemic would unfold. Being optimistic, we thought it would take only a few weeks and would resemble a kind of influenza. Of course, we didn't know that a day after the first wave, the Israel Ministry of Health would report Israel's first COVID-19 patient—27 February 2020. Our aim was to administer the first wave at the beginning of the pandemic and then determine how to proceed as matters developed.

Measures

Subjective Well-Being The SWB measures are based on the Gallup World Poll survey (see, e.g., Diener et al., 2010; Kahneman & Deaton, 2010). These measures are used in the World Happiness Report to evaluate national happiness (including Israel) and ranking countries accordingly (World Happiness Report, 2020; see Table 2.1 and Technical Box 1).

The cognitive component of SWB was measured with Cantril's Self-Anchoring Striving Scale (CSASS). The CSASS comprises a single item asking respondents to assess their global evaluation of life on an 11-point ladder scale, ranging from 0 (*worst possible life*) to 10 (*best possible life*).

SWB's affective component was measured by self-reports of positive and negative feelings. Positive feelings were measured using three questions about the degree to which respondents experienced specific positive emotions (enjoyment, smile/laughter, and exaltation) during the previous day. Negative feelings were measured using four questions regarding negative emotional states (worry, sadness, depression, and anger) that the respondent experienced during the previous day. All feelings were assessed on an 11-point Likert-type scale, ranging from 0 (*not at all*) to 10 (*completely*).

Socio-Demographic Measures Several self-report demographic measures were included: *Perceived health*—Respondents were asked to report their subjective health condition on a 5-point Likert-type scale, ranging from 1 (*very bad*) to 5 (*very good*). *Financial satisfaction*—Respondents were requested to indicate, "How satisfied are you with your financial situation?" on a 7-point Likert-type scale, ranging from 1 (*not satisfied at all*) to 7 (*very satisfied*). Financial satisfaction (rather than income level) has been reported to be positively and highly correlated with SWB predictors (Dolan et al., 2008; Sherman & Shavit, 2018); hence income level was not used.

Other socio-demographic measures comprised age, gender, marital status, having children and education.⁴ We also asked the participants about their employment status. Only 11%, 13.4% and 17.9% in groups A, B and C respectively reported that they were not working at the time of the survey. However, as in other countries, many Israelis were compelled to take temporary unpaid leave from their work and received unemployment stipends. This labor market status is incomparable among the three groups; therefore, labor market status was excluded from the analysis.

⁴ The options were: (1) 8 years, (2) 9–10 years, (3) 11–12 years; (4) Some high school; (5) High school graduate; (6) Some nonacademic training; (7) Completed non-academic training; (8) Studying for bachelor's degree; (9) Bachelor's degree; (10) Studying for master's degree; (11) Master's degree graduate; (12) Studying for doctorate; (13) Doctorate.

Procedure

All three groups were administered the identical SWB and demographic measures at three measurement points: Group A was examined just before the announcement of the first verified patient in Israel; Group B during the period of lockdown when no exit strategy had been announced; Group C when the exit strategy was announced and was started to be implemented. The participants were part of the Midgam Project Poll and were invited by email to participate in the survey. They were told that their answers would be used only for research purposes and that they were free to discontinue their participation at any time if they felt uncomfortable. Before completing the questionnaire, participants electronically signed an informed consent. Upon completing all the questions, participants were thanked, and a *Good-Bye* notification was presented on their screen. Participants received 7 New Israeli Shekels (approximately \$US 2) for their time.

Results

Comparing the Main SWB Measures between the Groups

Table 1 presents the means and standard deviations of the subjective measure for each group.

Upon examining reports of global life evaluations, we found no significant group effect. The post-hoc tests showed no significant differences between any of the groups throughout the pandemic. Thus, as the pandemic crisis unfolded, SWB's average cognitive component remained stable.

A significant group effect was revealed for positive and negative feelings. The post-hoc tests revealed that positive feelings of well-being were lower for Group B than for Group A, indicating declining positive feelings as the lockdown came into force. Positive feelings of well-being did not distinguish between Groups B and C, showing that positive feelings did not improve as the exit strategy's implementation was introduced. Negative feelings rose in Group B compared with Group A and declined from Group B to Group C, indicating that negative feelings reached their peak in the course of the lockdown.

Regarding financial satisfaction, post-hoc tests revealed a small but significant decrease in satisfaction from Group A's reports to Group B's reports, implying that the emerging economic uncertainty due to objective changes in the Israeli labor market was at least partially captured in the data. No significant difference in financial satisfaction from Group B's reports to Group C's reports was revealed. Finally, no significant group differences were manifested regarding self-rated health, indicating this variable's stability over time.

Table 1 Mean (SD) for the Different Subjective Measures for Each Group

	Group A: Pre-crisis	Group B: During the lockdown	Group C: Exit strategy	ANOVA
Evaluation of life ^a (0–10)	6.76 (1.87)	6.58 (1.90)	6.63 (1.90)	$F(2,2203)=1.787$ n.s
Positive feelings (0–10) (Cronbach's $\alpha=.857$)	5.15 (2.47)	4.32 (2.56)	4.57 (2.53)	$F(2,2203)=20.638$ $p<.01$
Negative feelings (0–10) (Cronbach's $\alpha=.864$)	2.40 (2.32)	3.65 (2.60)	2.80 (2.41)	$F(2,2203)=49.04$ $p<.01$
Financial satisfaction (1–5)	3.99 (1.81)	3.78 (1.81)	3.91 (1.79)	$F(2,2203)=2.433$ n.s
Subjective health (1–5)	4.35 (0.83)	4.38 (0.82)	4.43 (0.81)	$F(2,2203)=1.553$ n.s

^a We found that 37.3%, 42.5%, and 39.9%, in groups A, B, and C, respectively, answered the score 6 or below to the Life Evaluation Question. This may indicate that respondents with relatively low life evaluation levels also completed the survey and not only those with relatively high life evaluations

An ANOVA analysis for each of the positive and negative emotions separately revealed a main group effect that was comparable for the total positive and total negative emotions. The post-hoc tests revealed that each positive emotion (enjoyment, smile/laughter, exaltation) was lower for Group B than for Group A, similar to the total positive emotions measure. Enjoyment and smile/laughter did not distinguish between Groups B and C, similar to their total positive emotions scores. However, the post-hoc tests revealed a small but significant increase in exaltation from Group B's reports to Group C's reports. Regarding the negative emotions, the post-hoc tests revealed that each of the negative emotions rose in Group B compared with Group A, the same as the total negative emotions measure. All negative emotions declined significantly from Group B to Group C, the same as the total negative emotions measure, aside from anger, whose decline was insignificant.

Regression Analysis

We analyzed the *global life evaluation* (as the dependent variable) for each group. The independent variables in the continuous regression included the socio-demographic measures, gender (0 - male, 1 - female), age, having children (0 - no, 1 - yes), marital status (0 - unmarried, 1 - married), and education. Additional subjective measures include *self-rated health* and *financial satisfaction*. Following the methodology applied in the World Happiness Report (2020), SWB's affective component was included as an explanatory factor for SWB's cognitive component (World Happiness Report, 2020, Table 2.1, p. 16–17). The results are presented in Table 2.

The regression analysis supports previous findings in the literature (e.g., Dolan et al., 2008). These findings revealed that, on average, women report higher life satisfaction than

men, self-rated health is positively and strongly associated with life evaluation, and life satisfaction appears to be independent from having/not having children (Sherman & Shavit, 2018). However, our findings revealed a positive association between life satisfaction and having children for Group C. In line with the literature, we found financial satisfaction to be positively correlated with life evaluation. For all three groups, we found, as expected, that SWB's affective component was correlated with its cognitive component.

One question remains: Why did each group's average reflect comparable changes, whereas the affective component fluctuated in large scales? On the one hand, when progressing from Group A to Group B positive feelings decreased, and negative feelings increased. On the other hand, we identified a change in the weight of the feelings' coefficients.⁵ The average respondent maintained their life evaluation level during lockdown by reducing the weights of the positive and negative feelings coefficients (absolute value). Moreover, the results show that the weight of self-rated health in life satisfaction production function increased.

When comparing Groups B and C, positive feelings yielded stable measures, but the weight of negative feelings decreased. We also found that when cognizant of an exit strategy (Group C), the weight of self-rated health coefficient decreased.

Long-Term Life Evaluation in Israel

The current findings revealed that although significant changes in objective life conditions (e.g., imposed lockdown,

⁵ In order to examine significant differences between the regressions' coefficients of each group we also ran regressions, including an interaction analysis. The first regression related to an amalgam of Groups A and B and the second for Groups B and C.

Table 2 Regression Analysis Predicting Cognitive Component of SWB in Each Group

	Group A	Group B	Group C
Constant	3.628**	2.922**	3.006**
Gender (0 - male, 1 - female)	0.242*	0.268*	0.236*
Age	-0.042	-0.077	-0.009
Age ²	0.001	0.001*	0.000
Children (0 - no, 1 - yes)	0.276	0.250	0.367*
Marital status (0 - unmarried, 1 - married)	0.321*	0.254	0.572**
Self-rated health	0.352**	0.565**	0.314**
Education	-0.006	0.038	-0.005
Financial satisfaction	0.305**	0.335**	0.342**
Positive feelings	0.200**	0.118**	0.158**
Negative feelings	-0.185**	-0.084**	-0.164**
	Adjusted R ² =0.400	Adjusted R ² =0.317	Adjusted R ² =0.370
	F=49.8;	F=33.9;	F=45.65;
	p<.01	p<.01	p<.01

Note. * $p < .05$, ** $p < .01$

reduced opportunities for material consumption, reduced work opportunities) and in subjective measures (e.g., increased negative feelings and reduced positive feelings), the average life evaluation scores for each group were statistically similar. However, one may question if the life evaluation reported by Group A participants was significantly lower than the conventional times. In other words, do the life evaluations prior to and during COVID-19 statistically differ?

Table 3 presents life evaluation scores in three different data sets in Israel gathered by the same survey company. One is reported by Sherman and Shavit (2018), the second by Sherman et al. (2020), and the third by Barokas et al. (2020). The current findings reveal that Group A's life evaluation level was not statistically significantly lower than those reported in pre-COVID-19 crisis surveys.

Discussion

The COVID-19 pandemic offers a unique opportunity to investigate the response of individuals' SWB to a global health and economic crisis. The current study, analyzing the Israeli case, phase by phase, shows that although unintentional

changes in individuals' life circumstances (commonly described in economic terminology as *exogenous shock*) were manifested in a 52% increase in negative feelings and a 16% decrease in positive feelings, global life evaluation did not deviate from its pre-COVID-19 level. Data gathered for the three groups (i.e., prior to the first local confirmed COVID-19 patient, during the lockdown, and after announcing the exit strategy) suggest that the stability in life evaluation can be explained by structural changes in the weights of negative and positive feelings and the weight of self-rated health in the well-being production function. In times of crisis, whereas positive emotions decrease and negative emotions increase, their influence on the cognitive component is likely to weaken. The self-rated health measure remained stable throughout the crisis, but its effect on life satisfaction strengthened as the crisis progressed.

One plausible interpretation for the health self-evaluation dynamics is that Group B's average respondent learned to value good health. When people experience general lockdown in a global health crisis, feeling healthy is a psychological quality to be cultivated. People learned to pay more attention to factors that positively associates with their psychological well-being. In times of health concerns and emotional

Table 3 Group A in Comparison with Pre-COVID-19 Life Evaluation Surveys in Israel

Publication	Data collection dates	N	Mean life evaluation (SD)	Compared with Group A t-test, significance
Sherman and Shavit (2018)	5–6 January 2016	922	6.83 (1.76)	$t(1655)=0.76, ns$
Sherman et al. (2020)	5–10 December 2017	980	6.65 (1.85)	$t(1713)=1.24, ns$
Barokas et al. (2020)	11–14 March 2019	1110	6.89 (2.00)	$t(1843)=1.37, ns$

turbulence, the changes in the weightings of feelings and self-rated health are consistent with Diener et al.'s (2002) argument that “respondents appear to use heuristics to simplify the judgment task and to highlight certain types of information that are most salient to them” (p. 443). Attending more to feeling healthy and less to negative feelings exemplify the process of short-term reorganization (from pre-crises to lockdown) of the means of well-being.

The change in weights of some of the means of life satisfaction is a novel result whose significance is twofold: Most of the literature has addressed the changes in the weights of emotions, feelings, and other factors in SWB judgments (Bastian et al., 2014; Kuppens et al., 2008; Suh et al., 1998), for different societies, different socio-demographic aspects, or different life circumstances (Johansson et al., 2019; Oishi et al., 2007; Schimmack et al., 2002a, b). Diverging from these studies' typical methodologies, we did not examine the change in coefficient for different groups or situations. We investigated the change in emotions, feelings, and other factors' coefficients in the context of different levels of exogenous shock at different timings, based on the various phases of the emerging COVID-19 pandemic.

The effect of people's emotions and feelings on their life evaluations in an age of pandemics (Wolfe, 2011) is a novel finding that suggests a sanguine perspective regarding the long-term effects of the current health crisis. The change in the weights of emotions served as a psychological mechanism to maintain the pre-crisis life evaluation level and, consequently, decreased the prospect of modifying personal and social behaviors that were, in turn, positively associated with life satisfaction.

Another notable finding is how self-rated feelings and health changed for Group C (i.e., when the exit strategy was announced). Although the return to pre-crisis life routine was far from complete, it appears that individuals' expectations affected their emotions and, more importantly, affected the strength of the influence of emotions and self-rated health on global life evaluations. This behavior is consistent with the *anticipation effect* (Caplin & Leahy, 2001; Köszegi, 2010; Loewenstein, 1987), suggesting that our utility is also affected by expectations of future outcomes (positive or negative). Thus, the initial discussions of an exit strategy and its application in its initial phases may have triggered the anticipation for positive change and, consequently, influenced individuals' positive and negative feelings.

Having children was positively related to life evaluations, but only for Group C, following the exit strategy announcement. This noteworthy finding, describing families in which children were compelled to stay home, might be understood through two alternate scenarios: (1) As the parents were mostly busy with monitoring their children, it left no private time to think and become preoccupied with the more profound ramifications of the crisis; this may have especially characterized

parents of young children who were compelled to direct a highly intensive daily routine. Moreover, organizing the family's schedule and assuming more responsibility has been shown to decrease an individual's sense of helplessness and positively affect mental health in times of crisis (Karabati et al., 2017). (2) The second scenario involves parents adopting an enhanced sense of meaning and of their role in life; as parents spent more time with their children, more experiences were shared than typical during the routine pre-Corona times. Importantly, as the exit strategy was announced, parents may have felt a sense of accomplishment with relief—'WE DID IT!'—feeling success in having protected their families and having survived the crisis. Thus, it is reasonable to assume that a parent attained a greater sense of self-efficacy, performing a meaningful role in life, protecting and shielding them from a diminished life evaluation (Shrira et al., 2011).

This study offers a robust temporal measurement, looking at life evaluations at three phases of the Covid-19 pandemic crisis: before, during and at a potential endpoint. Nevertheless, it has been recognized that the traumatic effects of world crises can be delayed (Brooks et al., 2020), and hence, a follow-up study would facilitate a fuller understanding of the impact of this pandemic on life evaluations. In this manner, it would be valuable to compare our findings with future studies that assess the cognitive component with multi-item scales.

The cognitive judgment of the well-being ladder scale may have remained unchanged because the judgment is reported relative to society's benchmark. In a small society, one might assume the pandemic to have affected everyone more or less equally. However, we cannot substantiate this belief, nor do we have a measure of the impact of the pandemic on each participant. Hence, future evaluations may consider examining the cognitive judgment both relative and non-relative to the surrounding society.

Conclusion

The pandemic outbreak of COVID-19 is an extreme event that affects people worldwide. Its onset presented an opportunity to better understand the way people adjust to global health and economic crisis during a relatively brief period. At the moment, we still do not know when and how this pandemic will end. This study showed that in Israel, the emotional reaction to the first wave of the crisis demonstrated that whereas the affective component of SWB responded dramatically to new information regarding the state of the crisis, the cognitive component of SWB remained at its pre-crisis level. These findings demonstrate that changes in the weights of feelings and self-rated health can explain why life evaluation remains stable. During the writing of the paper, many countries, including Israel, have

been facing second and even third waves of the pandemic, circumstances that are likely to trigger further comprehensive research seeking to design national policies to facilitate coping with the psychological challenges that continue to be a factor in the age of pandemics.

Acknowledgements We would like to thank the research fund of the School of Business Administration in the College of Management Academic Studies Israel for the financial support.

Data Availability The datasets generated and analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethical Standard Statement The paper is compliance with the Ethical Standards of the journal. All procedures involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants involved in the study.

Conflicts of Interest The authors have no conflicts of interest to declare that are relevant to the content of this article.

On behalf of all authors, the corresponding author states that there is no conflict of interest.

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