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Evaluating the impact of a time orientation intervention on well-being during the COVID-19 lockdown: past, present or future?

Amelia Dennis , Jane Ogden  and Erica G. Hepper 

School of Psychology, University of Surrey, Guildford, UK

ABSTRACT

Lockdown policies brought on by the COVID-19 pandemic pose a threat to well-being. This study examined the effectiveness of three positive psychology interventions, with different time-orientations, on well-being as well as predictors of well-being during lockdown. Participants ($n = 261$) completed measures of lockdown characteristics, attachment orientation, and emotion regulation, were then randomly allocated to one of four interventions; nostalgia (past), gratitude (present), best possible self (BPS; future) or control (recalling a TV show), and completed outcome measures of well-being and affect. Results showed that BPS resulted in higher positive affect and that both BPS and gratitude resulted in higher social connectedness than the nostalgia intervention. Further, greater well-being during lockdown was predicted by greater attachment security, greater emotion regulation, and more social interactions. In sum, focusing on the present or future during lockdown is more effective for well-being than focusing on the past, which alongside trait characteristics predict well-being under lockdown.

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COVID-19; attachment; emotion regulation; nostalgia; gratitude; best possible self

In March 2020, the World Health Organization (WHO) characterised the novel coronavirus (COVID-19) as a pandemic (WHO, 2020). To control the spread of COVID-19 social distancing and lockdown policies were implemented across the globe (United Nations, 2020), leading to dramatic changes to the daily lives of every individual as different levels of restrictions were implemented. Previous pandemics and quarantines have both been shown to impair mental health and lead to a range of negative psychological effects such as depression, low mood, insomnia, and stress (Brooks et al., 2020). The current COVID-19 pandemic has been suggested to negatively impact on psychological well-being and lead to psychological threats such as depression and anxiety (Banerjee & Rai, 2020; Prati, 2020). It is therefore key to identify ways to increase well-being under lockdown. The primary aim of the present study was to evaluate the effectiveness of three positive psychology interventions for promoting well-being under these conditions. The study also aimed to assess which traits existing prior to lockdown predict well-being during lockdown. These interventions will now be considered.

The role of positive psychology interventions

Positive psychology highlights the potential role of three interventions which differ in their time-orientation but

have all been shown to increase well-being under different types of distress. The first is nostalgia which is past-oriented. Nostalgia is a predominately positive emotion both self-relevant and social (Hepper et al., 2012; Wildschut et al., 2006) and defined as 'a sentimental longing or wistful affection for the past' (*The New Oxford Dictionary of English*, 1998, pg. 1266). Nostalgia holds many benefits, and recalling a nostalgic event (compared to an ordinary-event) increases self-esteem, self-continuity, social connectedness, optimism, meaning, and positive affect (Abakoumkin et al., 2019; Hepper et al., 2012; Sedikides et al., 2018; Van Tilburg et al., 2019). Crucially, nostalgia has also been found to buffer key relevant threats such as loneliness and death awareness (Hepper et al., 2020; Routledge et al., 2011).

In contrast, gratitude interventions focus more on the present. One gratitude intervention is Three Good Things (TGT; Seligman et al., 2005), where people are asked to write down three good things that happened that day and why to increase positive awareness in the self. Previous studies have shown that completing TGT daily for 1 week led to immediate increases in happiness and positive affect and decreases in depressive symptoms with effects lasting up to a year (Gander et al., 2013; Mongrain & Anselmo-Matthews, 2012; Seligman et al., 2005). Additionally, a meta-analysis on gratitude interventions demonstrates the positive benefits on well-being

such as happiness (Dickens, 2017). TGT has also been shown to increase positive affect and reduce negative affect and depression under distress (e.g. emotional exhaustion; Sexton & Adair, 2019) and alcohol use disorder (Krentzman & Finn, 2019).

The third intervention is best possible self (BPS; Peters et al., 2010), which focuses on the future. BPS involves writing about the best outcomes for the self and works through inducing optimism. Recent meta-analyses have demonstrated the BPS intervention is effective at increasing well-being, positive affect, and optimism compared to controls (Carrillo et al., 2019; Heekerens & Eid, 2020; Malouff & Schutte, 2016). In comparison with other optimism interventions, BPS was shown to be more effective at inducing optimism (Malouff & Schutte, 2016). Additionally, BPS is effective at buffering distress by reducing pain intensity (Hanssen et al., 2013) and physiological response to stress (Nicolson et al., 2020).

Positive psychology, therefore, offers three time-orientation interventions which have been shown to have a number of benefits and may benefit to well-being while under lockdown.

Predictors of well-being

The secondary aim of the present study was to explore the role of trait characteristics in predicting characteristics that promote well-being during lockdown. One possible predictor of well-being under lockdown is attachment orientation (i.e. one's dispositional style of managing close relationships and interpersonal emotions). Attachment orientation consistently predicts well-being both generally and under stress, negative affectivity, and psychiatric symptoms (for a review see Mikulincer & Shaver, 2007). Attachment is conceptualised by two continuous underlying dimensions; attachment anxiety and attachment avoidance (Brennan et al., 1998). These attachment orientations are especially relevant under threat (such as lockdown) as threat activates the attachment behavioural system that influences an individual's behavioural and emotional response (Mikulincer & Shaver, 2003).

Attachment anxiety reflects a desire for closeness coupled with a heightened fear of abandonment from relationship partners due to receiving inconsistent and overprotective care (Brennan et al., 1998). Highly attachment anxious individuals have higher sensitivity to threat (Fraleigh & Shaver, 2000) and when the attachment behavioural system is activated high attachment anxiety promotes and intensifies distress (Mikulincer & Shaver, 2007). However, attachment avoidance reflects a discomfort

with closeness and desire for independence due to previously receiving rejecting care (Brennan et al., 1998). Under threat, highly attachment avoidant individuals employ strategies including suppressing support-seeking and distress (Gross & John, 2003; Mikulincer & Shaver, 2003), resulting in unresolved distress and impairing the ability to deal with distress (Mikulincer & Shaver, 2007). Therefore, attachment insecurity may impede well-being during lockdown.

Emotion regulation (ER) may also predict well-being during lockdown in response to COVID-19. ER is the capacity to modulate the intensity, duration, valence, experience, and expressions of emotions (Gross, 1998). Studies have consistently shown the importance of trait ER in emotional functioning and well-being. For example, emotion dysregulation is associated with higher trait negative state (Glenn & Klonsky, 2009), state negative affect (Daros et al., 2019), and more psychopathy symptoms (Aldao, 2013). Further, the use of effective ER strategies can help promote well-being, both generally and under stress (Moriya & Takahashi, 2013; Troy et al., 2010). ER, may, therefore predict well-being while under lockdown.

Well-being under lockdown may not only, however, be predicted by trait characteristics such as attachment and ER but also by lifestyle. For example, high-quality supportive relationships are linked with better physical and mental health (for reviews see Holt-Lunstad et al., 2010; Pietromonaco & Collins, 2017). Additionally, exercise is linked to increased positive affect and fewer depression and anxiety symptoms (Stathopoulou et al., 2006). Research, therefore, indicates that both trait characteristics and lifestyle impact well-being and thus may predict well-being under lockdown.

The current study

Positive psychology therefore offers three interventions which differ in their time-orientation namely nostalgia, gratitude, and BPS. To date, while research has compared the effectiveness of gratitude and BPS interventions (Carrillo et al., 2019) no studies have compared all three interventions. Further, no research has evaluated the effectiveness of these three interventions under the same threat. The primary aim of the current study was therefore to assess the impact of these three interventions and a control condition on well-being (meaning, optimism, self-continuity, self-regard, and social connectedness) during lockdown. Further, the study also aimed to assess whether above and beyond the intervention, well-being under lockdown was also predicted by trait characteristics (attachment orientation

and ER) and lifestyle factors (relationships and exercise). Identifying an effective intervention to improve well-being during lockdown is key to supporting the population in the event of future lockdowns. Furthermore, understanding the role of trait characteristics and lifestyle factors offers additional areas for manipulation to help buffer individuals against the adverse consequences of the isolation produced through the COVID-19 pandemic.

Method

Design

This online study used an experimental design with four conditions: nostalgia; gratitude; BPS; control. Participants completed baseline measures of trait characteristics and were then randomly allocated to one of these conditions. They then completed outcome measures relating to well-being.

Participants

A G*Power analysis with an effect size of $\eta_p^2 = 0.07$ (based on previous nostalgia effects sizes between 0.001 and 0.12; Abakoumkin et al., 2019; Sedikides et al., 2018; Van Tilburg et al., 2019), power of 0.8, alpha of 0.05, an ANCOVA with four groups, and three covariates suggested a sample size of 149 (Faul et al., 2007). The sample initially included a total of 385 participants but 124 participants were removed due to two or more incomplete measures ($n = 53$), taking a break ($n = 39$), unclear text answers ($n = 1$), and completing the study in under 7 min ($n = 1$). In addition, 30 male participants were removed, as this was deemed too small to assess gender differences which have previously been found in well-being (e.g. Bleidorn et al., 2016). The final sample consisted of 261 female participants. Eighty-six participants were recruited through a University lab token scheme for students, 88 participants were recruited through Prolific.ac and the remainder were recruited through social media, research websites and word of mouth.

Measures

After providing informed consent participants completed the following measures on Qualtrics, with attachment and trait ER counterbalanced to account for order effects.

Demographics

Participants were asked to describe their age, ethnic group, employment status, relationship status, and country of residence.

Lockdown and lifestyle information

Participants described their lockdown status and lifestyle factors, by reporting the number of days in lockdown and the number of people living with. Then, rating frequency interactions (virtually or in person) excluding the people living with and number of times outside in the last 2 weeks, in general, for exercise, and for work from 1 (*Not at all*) to 4 (*More than once a day*).

Trait measures

Attachment. Participants completed the Experiences in Close Relationships (ECR; Brennan et al., 1998) adapted to focus on global attachment (e.g. 'I am very comfortable being close to others') as used in previous research (e.g. Carnelley & Rowe, 2007). Eighteen items each measured attachment anxiety ($\alpha = .93$) and attachment avoidance ($\alpha = .92$) on a 7-point Likert scale from 1 (*Disagree strongly*) to 7 (*Agree strongly*).

Emotion regulation. ER was measured using the Difficulties in Emotion Regulation Scale Short Form (DERS-SF; Kaufman et al., 2016). The 18-item scale ($\alpha = .90$) measures ER on a 5-point scale from 1 (*Almost never*) to 5 (*Almost always*) capturing ER awareness, clarity, goals, impulse, non-acceptance, and strategies. Higher scores indicate greater emotion dysregulation.

Time-orientated interventions

Participants were randomly assigned by Qualtrics to one of four interventions; nostalgia, gratitude, BPS or control. In all four interventions, participants had to stay on the page for 2 min and were asked to provide a summary of their thoughts and feelings (except from the three good things condition where participants completed a list).

Nostalgia (past-oriented). Participants in the nostalgia condition completed an adapted Event Reflection Task (ERT; Sedikides et al., 2015). The ERT was adapted to ensure participants thought of a nostalgic event prior to lockdown. Participants were instructed to '... think of a nostalgic event in your life that occurred before the lockdown. Specifically, try to think of a past event that makes you feel most nostalgic.'

Gratitude (present-oriented). Participants were induced in gratitude through an adapted three good

things task (TGT; Seligman et al., 2005). Participants were instructed to '... list three things that went well today and why.'

Best Possible Self (future-oriented). Participants were induced in optimism through an adapted Best Possible Self (BPS; Peters et al., 2010) with participants imagining their best possible self after the lockdown. Participants were instructed to

... think about your best possible self and write down your thoughts. "Think about your best possible self" means that you imagine yourself in the future, after the lockdown has been lifted and after everything has gone as well as it possibly could.'

Control. A typical control condition for a nostalgia and BPS intervention is recalling an everyday ordinary-event or typical day (Peters et al., 2010; Sedikides et al., 2015). This could not be used in the current study as all participants were under some degree of lockdown changing their everyday events, thus recalling ordinary events may elicit negative affect. In contrast, a typical control condition for gratitude has typically been to write down early memories (Seligman et al., 2005). This control for the gratitude condition could not be used either as it is too similar to the nostalgia intervention. Therefore, it was decided to adapt the control intervention for the Event Reflection Task (ERT; Sedikides et al., 2015), that is used to control for nostalgia. Rather than asking participants to recall an ordinary-event, they were asked to recall a recent television plot. This was deemed both sufficiently similar to a past control condition for nostalgia and sufficiently different to the intervention but also appropriate in a time of lockdown. In line with this participants in the control intervention were instructed to '... recall a television programme or movie plot that you have watched recently.'

Outcome measures

Positive and negative affect. State emotion was measured after the intervention using the Positive and Negative Affect Schedule (PANAS; Watson et al., 1988). The items were preceded with the stem 'Right now, I'm feeling ...' with all items being rated on a scale from 1 (*Not at all*) to 5 (*Very much*); (positive affect: 10 items: e.g. 'Interested', 'Excited', $\alpha = .91$; negative affect: 10 items, e.g. 'scared', 'irritable', $\alpha = .91$).

Well-being. Participants completed measures of state social-connectedness (Cheung et al., 2013; $\alpha = .87$), perceived meaning (Hepper et al., 2012; Routledge et al., 2011; $\alpha = .89$), self-regard (Hepper et al., 2012; $\alpha = .94$),

self-continuity (Sedikides et al., 2015; $\alpha = .84$) and optimism (Cheung et al., 2013; $\alpha = .89$). All five sub-scales comprised four items preceded by the item 'Right now, I feel ...' and rated on a 6-point Likert scale ranging from 1 (*Strongly disagree*) to 6 (*Strongly agree*). The five sub-scales were analysed separately and also summated as total well-being ($\alpha = .95$) and have previously been well validated (Abakoumkin et al., 2019; Van Tilburg et al., 2019).

Manipulation checks. Lastly, participants completed manipulation checks for nostalgia, optimism and gratefulness. Each sub-scale was measured through three items preceded by the stem 'When I brought my image to mind ...' (1 = *Strongly disagree*, 6 = *Strongly agree*). State nostalgia ($\alpha = .96$) was measured through an adapted version of the nostalgia manipulation check (Wildschut et al., 2006) using three items; 'I was feeling quite nostalgic', 'I was having nostalgic feelings', 'I was nostalgic at the moment'. State gratefulness ($\alpha = .89$) was measured through an adapted version of Emmons and McCullough (2003) state gratefulness through three items; 'I felt grateful', 'I felt grateful for today', 'I felt thankful'. State optimism ($\alpha = .90$) was measured with an adapted version of the dispositional Life Orientation Test-Revised (Scheier et al., 1994) through three items; 'I was optimistic for the future', 'I thought things will turn out as hoped', 'I thought good things will happen to me'.

Results

Data analysis

Data were analysed to describe demographics and assess differences by intervention for lockdown characteristics, lifestyle characteristics, and trait variables using descriptive statistics, ANOVA and X^2 . Next a manipulation check was carried out. Then, the impact of the time-orientation intervention on well-being was assessed using ANOVA and post hoc tests. Finally, the role of demographics, lockdown and lifestyle characteristics and trait measures in predicting well-being during lockdown was assessed using multiple regression analysis.

Participant demographics

Participant demographics for all participants and by intervention are shown in Table 1. The results showed on average participants were 25 years old, white, students, single, and resided in the UK. There were no differences by intervention indicating that randomisation was effective.

Table 1. Participant demographics by intervention.

		All (N= 261)	Nostalgia (n= 63)	Gratitude (n= 67)	BPS (n= 73)	Control (n= 58)	F	p
Age (range: 18–63 years)	<i>M (SD)</i>	25.05 (9.43)	25.97 (10.23)	24.66 (8.26)	23.53 (8.39)	26.43 (10.84)	1.29	.279
Relationship status							.14	.934
Single	<i>n (%)</i>	116 (44.4)	30 (47.6)	28 (41.8)	31 (42.5)	27 (46.6)		
Dating one or more people	<i>n (%)</i>	15 (5.7)	5 (7.9)	4 (6.0)	5 (6.8)	1 (1.7)		
In a committed relationship	<i>n (%)</i>	100 (38.3)	19 (30.2)	26 (38.8)	31 (42.6)	24 (41.4)		
Engaged/married	<i>n (%)</i>	30 (11.5)	9 (14.3)	9 (13.4)	6 (8.2)	6 (10.3)		
Occupation							1.52	.210
Student	<i>n (%)</i>	174 (66.7)	39 (61.9)	44 (65.7)	54 (74.0)	37 (64.9)		
Employed full-time	<i>n (%)</i>	52 (19.9)	14 (22.2)	17 (25.4)	7 (9.6)	14 (24.6)		
Employed part-time	<i>n (%)</i>	13 (5.0)	2 (3.2)	1 (1.5)	8 (11.0)	2 (3.5)		
Parent/carer/home-maker	<i>n (%)</i>	1 (0.4)	0 (0.0)	1 (1.5)	0 (0.0)	0 (0.0)		
Self-employed	<i>n (%)</i>	7 (2.7)	1 (1.6)	3 (4.5)	2 (2.7)	1 (1.8)		
Retired	<i>n (%)</i>	3 (1.1)	1 (1.6)	0 (0.0)	0 (0.0)	2 (3.5)		
Unable to work	<i>n (%)</i>	1 (0.4)	0 (0.0)	0 (0.0)	1 (1.4)	0 (0.0)		
Unemployed	<i>n (%)</i>	8 (3.1)	5 (7.9)	1 (1.5)	1 (1.4)	1 (1.8)		
Other	<i>n (%)</i>	1 (0.4)	1 (1.6)	0 (0.0)	0 (0.0)	0 (0.0)		
Ethnicity							.60	.616
Asian	<i>n (%)</i>	23 (8.8)	1 (1.6)	7 (10.4)	7 (9.6)	2 (3.4)		
Black	<i>n (%)</i>	11 (4.2)	3 (4.8)	4 (6.0)	2 (2.7)	8 (13.8)		
White	<i>n (%)</i>	207 (79.3)	54 (85.7)	50 (74.6)	57 (78.1)	46 (79.3)		
Mixed	<i>n (%)</i>	13 (5.0)	3 (4.8)	5 (7.5)	4 (5.5)	1 (1.7)		
Other	<i>n (%)</i>	7 (2.7)	2 (3.2)	1 (1.5)	3 (4.1)	1 (1.7)		
Country of residence							1.92	.126
United Kingdom	<i>n (%)</i>	161 (61.7)	33 (52.4)	47 (70.1)	49 (67.1)	32 (55.2)		
Other	<i>n (%)</i>	100 (38.3)	30 (47.6)	20 (29.9)	24 (32.9)	26 (44.8)		

Table 2. Participant lockdown and trait characteristics by intervention.

		All (N= 261)	Nostalgia (n= 63)	Gratitude (n= 67)	BPS (n= 73)	Control (n= 58)	F	p
Lockdown days (range: 14–84 days)	<i>M (SD)</i>	39.22 (13.35)	38.32 (12.05)	38.74 (13.47)	39.59 (14.30)	40.25 (13.52)	.40	.867
Number of people living with (range: 0–9 people)	<i>M (SD)</i>	2.56 (1.35)	2.28 (1.24)	2.45 (1.33)	2.99 (1.30)	2.44 (1.46)	3.60	.014*
Number of times outside in the last 2 weeks?							.08	.969
Not at all	<i>n (%)</i>	49 (18.8)	10 (15.9)	14 (20.9)	14 (19.2)	11 (19.0)		
Several times a week	<i>n (%)</i>	136 (52.1)	39 (61.9)	32 (47.8)	37 (50.7)	28 (48.3)		
Once a day	<i>n (%)</i>	61 (23.4)	9 (14.3)	18 (26.9)	19 (26.0)	15 (25.9)		
More than once a day	<i>n (%)</i>	15 (5.7)	5 (7.9)	3 (4.5)	3 (4.1)	4 (6.9)		
Number of times outside in the last 2 weeks for exercise?							.25	.863
Not at all	<i>n (%)</i>	83 (31.8)	18 (28.6)	22 (32.8)	20 (27.4)	23 (39.7)		
Several times a week	<i>n (%)</i>	108 (41.4)	30 (47.6)	26 (38.8)	33 (45.2)	19 (32.8)		
Once a day	<i>n (%)</i>	66 (25.3)	13 (20.6)	19 (28.4)	19 (26.0)	15 (25.9)		
More than once a day	<i>n (%)</i>	4 (1.5)	2 (3.2)	0 (0.0)	1 (1.4)	1 (1.7)		
Number of times outside in the last 2 weeks for work?							.71	.547
Not at all	<i>n (%)</i>	231 (88.5)	56 (88.9)	58 (86.6)	64 (87.7)	53 (91.4)		
Several times a week	<i>n (%)</i>	18 (6.9)	5 (7.9)	3 (4.5)	7 (9.6)	3 (5.2)		
Once a day	<i>n (%)</i>	11 (4.2)	2 (3.2)	5 (7.5)	2 (2.7)	2 (3.4)		
More than once a day	<i>n (%)</i>	1 (0.4)	0 (0.0)	1 (1.5)	0 (0.0)	0 (0.0)		
Number of interactions (virtually or in person) with people you don't live with							.11	.954
Not at all	<i>n (%)</i>	39 (14.9)	11 (17.5)	8 (11.9)	8 (11.0)	12 (20.7)		
Several times a week	<i>n (%)</i>	146 (55.9)	34 (54.0)	38 (56.7)	48 (65.8)	26 (44.8)		
Once a day	<i>n (%)</i>	49 (18.8)	10 (15.9)	15 (22.4)	11 (15.1)	13 (22.4)		
More than once a day	<i>n (%)</i>	27 (10.3)	8 (12.7)	6 (9.0)	6 (8.2)	7 (12.1)		
Trait measures								
Anxiety	<i>M (SD)</i>	3.91 (1.17)	3.93 (0.95)	3.68 (1.21)	4.12 (1.11)	3.86 (1.38)	1.68	.172
Avoidance	<i>M (SD)</i>	3.48 (1.05)	3.60 (1.10)	3.44 (0.91)	3.37 (1.11)	3.53 (1.07)	.63	.597
Trait emotion regulation	<i>M (SD)</i>	2.51 (0.71)	2.55 (0.75)	2.43 (0.66)	2.55 (0.75)	2.53 (0.69)	.42	.743

Lockdown and lifestyle characteristics and trait variables

Lockdown and lifestyle characteristics and trait measures for all participants and by intervention are displayed in Table 2. All participants were living under varying degrees of lockdown as a result of COVID-19, with average time in

lockdown being 39 days and living with an average of three people. Most participants had left the house and exercised outside of the house several times a week but did not leave the house at all for work. Additionally, the majority of participants interacted, virtually or in person, with someone outside of their household several times a week. The results show that only number of people living

with was significantly different by intervention, with randomisation being successful for the rest of the variables.

Manipulation check

For the manipulation check, one-way ANOVAs were conducted with state nostalgia, state gratefulness, and state optimism as the dependent variables. The results showed significant differences in state nostalgia, state gratefulness, and state optimism by intervention (see Table 3). Post hoc test revealed that state nostalgia was significantly higher in the nostalgia intervention compared to the gratitude, BPS and control interventions, and that state gratefulness was significantly higher in the gratitude intervention compared to BPS and control interventions and state optimism was significantly higher in the BPS intervention compared to the control intervention. This indicates that the interventions were effective. However, state gratefulness was also significantly higher in the nostalgia intervention compared to the control intervention, and state optimism was significantly higher in the gratitude intervention compared to the control intervention. This indicates that engaging in nostalgia can also induce gratitude and engaging in gratitude can also induce optimism.

Impact of intervention on well-being in lockdown

To examine the effect of the intervention on well-being an ANCOVA was conducted on measures of

well-being, positive and negative affect (see Table 4). Anxiety, number of people living with, and number of times outside for work were added as covariates due to baseline differences between condition and their link to well-being. The results showed a main effect of intervention on social connectedness and positive affect. Planned contrasts revealed that participants in the nostalgia intervention showed significantly lower levels of social connectedness than those in the gratitude ($d = 0.41$) or BPS ($d = 0.41$) intervention, with small effect sizes. For positive affect, planned contrasts revealed that participants in the nostalgia intervention reported significantly lower positive affect compared to participants in the BPS intervention, with a small effect size ($d = 0.40$). This indicates that during lockdown nostalgia can lead to less positive affect and less social connectedness compared to the gratitude and BPS interventions, although the effect sizes were small. No main effect of intervention was found for self-regard, self-continuity, meaning, optimism, total well-being or negative affect.

Predictors of well-being under lockdown

To predict well-being during lockdown, beyond intervention, three hierarchical multiple regression analyses were conducted with three dependent variables: total well-being, positive affect and negative affect. In all three regressions, intervention was included in the first

Table 3. Manipulation checks by intervention.

	All (N = 261)		Nostalgia (1) (n = 63)		Gratitude (2) (n = 67)		BPS (3) (n = 73)		Control (4) (n = 58)		Main effect of intervention			Post hoc
	M	SD	M	SD	M	SD	M	SD	M	SD	F (3, 257)	p	η_p^2	
State nostalgia	3.82	1.48	5.12	0.92	3.67	1.35	3.21	1.37	3.34	1.42	29.99	.000	.26	1 > 2, 3, 4*** $d = 1.07, d = 1.39, d = 1.25$
State gratefulness	4.52	1.19	4.59	1.19	5.16	0.77	4.26	1.21	4.02	1.23	12.72	.000	.13	1, 2 > 4* $d = 0.46, d = 0.93$ 2 > 3*** $d = 0.74$
State optimism	4.14	1.19	3.95	1.24	4.45	0.90	4.38	1.22	3.68	1.24	6.30	.000	.07	2 > 4** $d = 0.62$ 3 > 4** $d = 0.56$

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 4. Well-being and affect by intervention.

	All (N = 261)		Nostalgia (1) (n = 63)		Gratitude (2) (n = 67)		BPS (3) (n = 73)		Control (4) (n = 58)		Main effect of intervention			Post hoc
	M	SD	M	SD	M	SD	M	SD	M	SD	F(1, 236)	p	η_p^2	
Social connectedness	4.51	1.09	4.25	1.07	4.69	1.03	4.69	1.05	4.40	1.12	2.65	.049	.03	2, 3 > 1* $d = 0.41, d = 0.41$
Self-regard	4.09	1.17	3.95	1.05	4.16	1.08	4.15	1.23	4.13	1.23	0.84	.471	.01	
Self-continuity	4.06	1.08	4.21	1.07	3.99	0.98	4.14	0.98	3.88	1.26	1.87	.136	.02	
Meaning	4.55	1.17	4.44	1.14	4.64	1.15	4.64	1.20	4.36	1.23	1.05	.373	.01	
Optimism	4.07	1.23	3.85	1.29	4.14	1.12	4.25	1.24	4.03	1.24	1.68	.171	.02	
Total well-being	4.26	0.96	4.14	0.95	4.33	0.91	4.37	0.95	4.16	1.01	1.44	.232	.02	
Positive affect	2.68	0.87	2.46	0.86	2.64	0.86	2.81	0.88	2.76	0.89	2.64	.050	.03	3 > 1** $d = 0.40$
Negative affect	1.80	0.80	1.82	0.79	1.70	0.66	2.00	0.96	1.67	0.73	1.51	.213	.02	

* $p < 0.05$, ** $p < 0.01$.

Table 5. Predictors of well-being, positive affect and negative affect under lockdown.

Variable	Total well-being β	Positive affect β	Negative affect β
Step 1: Intervention	-.01	.13	.01
Step 2: Intervention	-.01	.12	-.01
Anxiety	-.17*	-.01	.07
Avoidance	-.28***	-.05	.09
Trait emotion regulation	-.20*	-.17	.32***
Age	.03	.17*	-.07
Relationship status	.04	.07	.03
Lockdown days	.06	.14*	.11
Number of people you live with	.05	.02	-.02
Number of times outside	-.03	-.02	-.06
Number of times outside for exercise	.01	.06	-.07
Number of times outside for work	.01	.07	-.03
Number of interactions	.12*	-.02	-.06

Values are standardised regression β -coefficients. * $p < 0.05$, *** $p < 0.001$.

block to control for it with demographics, lockdown and lifestyle characteristics and trait measures in the second block. See Table 5 for results.

Predicting total well-being

In step 1, intervention was a non-significant predictor of well-being accounting for 0.4% of the variance ($F = 0.01$; $p = .928$). In step 2, lower avoidance, lower anxiety, less difficulties with trait ER, and more interactions with people outside household predicted better well-being. The overall model accounted for 25.6% of the variance in well-being ($F = 7.53$; $p < .001$).

Predicting positive affect

In step 1, intervention was a non-significant predictor of positive affect accounting for 1.1% of the variance ($F = 3.72$; $p = .055$). In step 2, older age and more days in lockdown predicted higher positive affect. The overall model accounted for 10.5% of the variance in positive affect ($F = 3.322$; $p < .001$).

Predicting negative affect

In step 1, intervention was a non-significant predictor of negative affect accounting for 0.4% of the variance ($F = 0.02$; $p = .869$). In step 2, greater difficulties with trait ER predicted higher negative affect. The overall model accounted for 19.3% of the variance in negative affect ($F = 5.72$; $p < .001$).

Discussion

This study aimed first to evaluate the effect of three positive psychology interventions differing in their time-

orientation on well-being during lockdown and second, to identify predictors of well-being under lockdown.

The effect of interventions

In terms of the primary aim, the results from the experimental intervention indicated that those who undertook either the BPS or gratitude interventions showed significantly higher social connectedness than those in the nostalgia intervention condition. Additionally, the BPS intervention showed significantly higher positive affect than the nostalgia intervention. These findings reflect recent meta-analyses that have identified the benefits of focusing either on the present through gratitude of the future through BPS (Carrillo et al., 2019; Dickens, 2017) indicating that both these time-orientations may be of most benefit during lockdown. Gratitude has been suggested to draw attention away from negative aspects of one's life and instead directs attention towards positive aspects allowing for the savouring of these good things (Lau & Cheng, 2013; Seligman et al., 2006). In contrast, BPS has self-enhancement (Salgado & Berntsen, 2019) and self-regulatory benefits by reducing ambivalence around life goals (Heckerens et al., 2020). Both gratitude and BPS may, therefore, provide more benefit for well-being than past time-orientation through nostalgia. There are several possible reasons for these findings. First, many studies exploring the impact of nostalgia have utilised artificial experimental settings (e.g. Routledge et al., 2011), whereas, the present study was carried out during a real-world intervention. Factors such as the uncertainty over the timeline of lockdown and the all pervasive impact of lockdown may have undermined the benefits of nostalgia. Second, previous nostalgia studies have often involved student samples. In contrast, the sample for the present study had a wider age range and research has demonstrated the role of age in nostalgia (e.g. Hepper et al., 2020). Third, previous studies may have under-estimated the impact of loss which can be generated by nostalgia (Boym, 2001; Davalos et al., 2015) that may be more pertinent to the impact of lockdown during a pandemic which has involved loss on many levels. Moreover, there were only small effect sizes for the difference between the nostalgia compared to the gratitude and BPS intervention on well-being, when run across a large population small effects can, in theory, have a big impact on well-being (Huppert, 2009). Additionally, positive psychology interventions have larger effects when run over a longer period of time (Bolier et al., 2013) therefore the effectiveness of gratitude and BPS (compared to nostalgia) may increase with repeated use. In sum, a present or

future time-orientation focus may be more effective for promoting well-being during lockdown compared to taking a past time-orientation approach.

Predictors of well-being

For the second aim, the results showed that greater well-being under lockdown was predicted by lower attachment anxiety, lower attachment avoidance, better ER ability, and more social interactions. This reflects previous research which has highlighted a similar role for emotion dysregulation, social interactions, and attachment orientations (Mikulincer & Shaver, 2007; Pietromonaco & Collins, 2017; Schutte et al., 2009). There are several possible explanations for these findings. First, there is the potential role of rumination and suppression, two strategies of regulating emotions that negatively impact well-being (Gross & John, 2003). Future research could measure these ER strategies directly. Attachment insecurity has been linked with greater emotion dysregulation; high attachment anxiety is linked with rumination, whereas, high attachment avoidance is associated with suppression (Mikulincer & Shaver, 2003). Accordingly, attachment and ER may link to well-being during lockdown through rumination and suppression. The results from the present study, however, also indicated a role for social interactions which indicates the impact of an additional factor – support seeking. Support seeking is important to well-being (Feeney & Collins, 2015); however, attachment insecurity inhibits effective support seeking with both high attachment avoidance and high anxiety being related to less effective support seeking (Don et al., 2019; Simpson et al., 2002). Accordingly, during lockdown attachment insecurity in the form of both avoidance and anxiety may exacerbate the impact of reduced social support imposed by lockdown, through a reluctance to seek ‘lockdown permitted’ social support leading to fewer social interaction. Therefore, while attachment secure individuals may compensate for reduced social interactions where possible, those who are insecure may be less likely to do so.

In terms of affect, the results showed that positive affect was predicted by older age and more days spent under lockdown, whereas negative affect was predicted by greater emotion dysregulation. This indicates that individuals may adjust to lockdown over time and that in line with previous research, older adults may show greater positivity, derived from more effective coping strategies and less perceived stress (Folkman & Moskowitz, 2000; Hamarat et al., 2001). Further, the link between negative affect and ER also reflects previous research (Daros et al., 2019) although given the overlap

between items on the DERS assessing emotion dysregulation starting with ‘When I’m upset’ this association is less surprising. In sum, the results indicate that well-being and affect in lockdown are predicted by trait characteristics and that social interactions and time may buffer against the negative impact of these unique conditions.

Limitations

There are, however some limitations that should be considered. First, the participants were all female. Due to the small proportion of males, males were excluded from the analysis as previous studies have shown gender differences in well-being (e.g. Bleidorn et al., 2016). Second, the sample was fairly homogeneous consisting of young, white females who are currently students with the majority living in the United Kingdom. This therefore limits the generalisability of the findings to a broader sample. This is of particular importance given how COVID-19 has been a worldwide pandemic affecting people of every age, gender, ethnicity, sexuality and from every country across the world and that lockdown has been imposed across a wide range of communities. Third, the intervention was brief, lasting only 2 min which may have minimised the impact of time-orientation on the outcome variables. Fourth, the effect size for the impact of the intervention was small however this can be expected for a brief intervention and more time spent on the intervention might enhance the impact of the interventions in future studies. Finally, follow-up measures were only taken immediately after the intervention due to anonymity of the study. Therefore, although some research shows lasting well-being effects for gratitude and BPS (Meevissen et al., 2011; Seligman et al., 2005), further research is needed to assess whether a time-orientation intervention also can have longer term benefits for lockdown.

Conclusion

To conclude, the results show focusing on the present (through gratitude) and future (through BPS) were more effective at promoting well-being during lockdown due to COVID-19 than focusing on the past (through nostalgia). The results also showed well-being during lockdown was predicted by ER, attachment insecurity, social interactions, time in lockdown, and age. In future lockdowns, individuals could be encouraged to take a more positive present or future-orientation outlook as a means of maintaining their well-being under these difficult conditions rather than dwelling on life before lockdown. This could be implemented within workplace or educational settings or

utilising social media and could encourage weekly gratitude or BPS interventions to be incorporated into people's daily routines. Furthermore, interventions priming attachment security or mindfulness meditation could be offered to modify trait variables such as attachment insecurity and ER and susceptible individuals could be encouraged to maximise their virtual social connections (Gillath & Karantzas, 2019; Roemer et al., 2015). Together both these approaches would help create a buffer against the isolation and disruption caused by any future lockdowns by both changing the time-orientation perspective of the individual and enabling them to maximise the resources available to them.

Disclosure statement

No potential conflict of interest was reported by the authors.

ORCID

Amelia Dennis  <http://orcid.org/0000-0002-9085-7432>
Jane Ogden  <http://orcid.org/0000-0003-4271-5621>
Erica G. Hepper  <http://orcid.org/0000-0003-4587-5866>

Data availability

The data that supports the findings of this study are available from the corresponding author, AD, upon reasonable request.

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