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Positive biases and psychological functioning during the coronavirus disease 2019 pandemic

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ABSTRACT

Many individuals have experienced a multitude of chronic stressors and diminished psychological functioning during COVID-19. The current study examined whether biases towards positive social media or positive autobiographical memories was related to increases in psychological functioning during COVID-19. Participants were 1071 adults ($M_{age} = 46.31$; 58% female; 78% White) recruited from MTurk. Participants reported on their social media consumption and autobiographical recall, positive and negative affect, and dysphoria symptoms. Results indicated that, at the first assessment collected in the spring and summer of 2020, positively biased social media consumption was cross-sectionally related to higher levels of positive affect, and positively biased autobiographical recall was cross-sectionally related to lower levels of negative affect and dysphoria symptoms. Sensitivity analyses examined cross-sectional relations from a second assessment collected in fall 2020, and prospective cross-lagged analyses. The findings point to potential psychological benefits of positive biases during chronic stressors.

Introduction

Chronic stressors can bring about enduring demands on individuals' financial, health, and social resources that can have adverse mental and physical health outcomes (Buheji et al., 2020; Taylor et al., 1988). The Coronavirus Disease 2019 (COVID-19) pandemic is an unprecedented chronic stressor that has brought on an international mental health crisis (Buheji et al., 2020). Rates of anxiety and depression significantly increased following the onset of COVID-19 (Robinson et al., 2022). Yet many individuals' anxiety and depression symptoms returned to pre-pandemic levels several months later, suggesting the potential for adaptation (Robinson et al., 2022). Individuals may be able to enhance their psychological adaptation to chronic stressors such as COVID-19 using positive bias, which is generally defined as a cognitive orientation towards positive aspects of one's experience and away from negative aspects (Buheji et al., 2020; Taylor et al., 1988).

According to the social psychological model, positive biases may promote positive self-perceptions and well-being in stressful contexts (Taylor et al., 1988): specifically, such biases may enhance individuals' sense of order and purpose, their motivation for goal pursuit, and their sense of being in control in their lives and having access to important resources. On the other hand, contrasting evidence suggests that because positive biases involve some incongruence between one's perceptions and the environment, they may lead to ineffective behaviours and psychological maladjustment (Rogers, 1959). For instance, Nie et al. (2022) found that adults with positive biases (of their health) had higher levels of depressive symptoms and lower levels of positive affect during COVID-19, suggesting that these adults may be more emotionally unprepared for major health crises.

Although the broader literature indicates that a variety of positive biases, such as optimistic bias and self-enhancement bias, may have psychological

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benefits (Taylor et al., 1988), we focus in the current study on positive biases theorised to be particularly beneficial in the context of chronic stressors. During chronic stressors, certain positive biases that diminish individuals' focus on negative information may provide relief from emotionally exhausting material (Taylor et al., 1988). The pandemic stress compensator framework theorises that eliminating stress exposure, such as that occurring through media exposure, and maximising exposure to positive experiences, such as that occurring through positive recall, may diminish one's negative response to stress (Buheji et al., 2020). For this reason, the current study focused on positively biased media consumption and autobiographical recall as two positive biases that may be particularly beneficial in the context of a chronic stressor such as COVID-19.

Positive biases in media consumption may promote adaptive psychological functioning during chronic stressors through engagement with positive media depicting helpful, heroic acts, or other positive images, in lieu of negative media depicting pessimistic or gruesome images, for example. While media coverage may have provided important information on COVID-19 to the public, the World Health Organization (2021) warned of an "infodemic" involving an overabundance of negative information during COVID-19 and recommended that individuals reduce COVID-19-related media consumption, particularly social media. However, few studies have differentiated between the effects of consuming positive versus negative social media in stressful contexts. One previous study found that viewing heroic acts on traditional or social media during COVID-19 was associated with higher positive affect (Chao et al., 2020). In contrast, studies on the 2014 missile attacks in Israel (Palgi et al., 2017) or the September 11 terrorist attack (Saylor et al., 2003) found that exposure to traditional or social media depicting helpful, heroic, or other positive images, did not relate to trauma symptoms.

Positively biased autobiographical recall is another type of positive bias that may promote adaptive psychological functioning during chronic stressors. Positively biased autobiographical recall, in which individuals recall positive personally experienced past events in greater detail than negative personally experienced past events, is theorised to reinstate positive emotions, cognitions, and behaviours tied to the recalled experience (Contractor et al., 2021). However, a recent systematic review found inconclusive evidence for the relation between positive memory recall and psychological functioning in trauma-

exposed individuals, with the majority of studies reporting null effects of positive memory recall on depressive and anxiety symptoms (Contractor et al., 2021). Findings are also mixed across the few published studies examining the effects of positive recall biases during COVID-19 more specifically. Niziurski and Schaper (2021) found that individuals with lower levels of depressive symptoms had more positive recall biases during COVID-19. In contrast, Zhang et al. (2021) found that individuals who recalled more positive (or neutral) words relative to negative words during COVID-19 had greater increases in depressive symptoms three months later. Sutin et al. (2021) reported that depressive symptoms were not related to later self-reported positive valence in COVID-19 memories.

Current study

The current study includes data from a large, longitudinal dataset with two assessments. We conducted a secondary data analysis to address several questions about Americans' functioning during COVID-19 (see pre-registration and Qualtrics survey: https://osf.io/wejrz/). Data collected from Assessment 1 (collected May – June 2020) is the focus of the current study, due to evidence that the employment, financial, and psychological "shocks" of COVID-19 were at their highest levels in Spring 2020 (Chandola et al., 2020). Data from Assessment 2 (collected September – November 2020) was used to examine the generalizability of our main study findings over time. In the current study, we examine whether positively biased social media consumption and positively biased autobiographical recall predict indices of psychological functioning, including positive and negative affect and dysphoria symptoms. We selected these outcomes to extend literature indicating that positive biases may share bidirectional relations with state affect (i.e. mood congruency; Van Bockstaele et al., 2014) and may be protective against psychopathology (Taylor et al., 1988). We focused exclusively on participants' use of Facebook, Instagram, and Twitter due to the secondary nature of our data; however, previous studies suggest that use of these platforms was related to well-being during COVID-19, whereas use of other platforms (i.e. TikTok) was not (Masciantonio et al., 2021). We tested six hypotheses as follows: Greater positively biased social media consumption would be related to (1) higher levels of positive affect, (2) lower levels of negative affect, and (3)

lower levels of dysphoria symptoms at Assessment 1; and that greater positively biased autobiographical recall would be related to (4) higher levels of positive affect, (5) lower levels of negative affect, and (6) lower levels of dysphoria symptoms at Assessment 1. Participant age, gender, race, socioeconomic status (SES), and the degree to which individuals had been impacted by COVID-19 may also influence psychological functioning, and thus were controlled in our analyses.

Methods

Participants

Amazon Mechanical Turk (MTurk) workers were recruited via CloudResearch (Litman et al., 2017). To be included in the current online study, individuals must have: (a) been U.S. adults over the age of 18 years old, (b) met attention check criteria, (c) had complete data on single-item variables of interest, and (d) completed at least 50% of items contributing to a given multi-item variable of interest. The full sample included 1071 adults (18–91 years old; $M = 46.31$, $SD = 15.77$). Most (78%) were White, whereas 9% were Black/African American, 7% were Asian American/Pacific Islander, 3% were multi-racial, and 3% were coded as other. Demographic information on the full sample is presented in supplemental material Table 1. A sub-sample of 951 individuals from the full sample who used the social media sites Facebook, Twitter, and/or Instagram was used to assess Hypotheses 1–3. Individuals who used social media were younger ($t(1069) = 3.20$, $p = .001$) and had higher levels of negative affect ($t(1069) = -2.77$, $p = .01$) and dysphoria symptoms ($t(1069) = -2.89$, $p = .004$) than individuals who did not use social media. There were no differences between those who did and did not use social media by gender, SES, race, or positive affect.

Sensitivity analyses were conducted including individuals that completed Assessment 2. Of the 1071 individuals that were eligible for inclusion (see supplemental material for details on excluded participants) in the full sample at Assessment 1, 797 (74%) were eligible for inclusion in the sensitivity analyses. Little's MCAR test showed that individuals that dropped out at the second assessment were not missing completely at random ($\chi^2 = 172.69$, $p < .001$). Participants who dropped out were younger ($t(1069) = -4.75$, $p < .001$) and had higher levels of

negative affect ($t(1069) = 5.10$, $p < .001$) and dysphoria symptoms ($t(1069) = 3.52$, $p < .001$) than participants who completed both assessments. There were no attrition differences by SES, race, or positive affect.

Procedures

The Institutional Review Board at Southern Methodist University approved all procedures and measures. MTurk participants provided informed consent and completed the Assessment 1 survey between May 13th 2020 and June 15th 2020. Participants who completed Assessment 1 were prompted weekly via CloudResearch from September 16th 2020 to November 3rd 2020 to complete Assessment 2. Participants were compensated $6.50 USD at Assessment 1 and $6 at Assessment 2, for ~45 min of participation per assessment. The survey was programmed and run using Qualtrics survey software (Qualtrics, 2021). In line with previous recommendations (Aguinis et al., 2021), several data cleaning strategies were used to ensure data quality (see supplemental material).

Measures

Positively Biased Social Media Consumption. Participants were asked whether they were currently using Facebook, Twitter, and/or Instagram. Those who endorsed social media use were asked to rate whether posts from family, friends, and people they follow on that platform were primarily positive or negative ($-3 = extremely negative$, $-2 = moderately negative$, $-1 = slightly negative$, $0 = neither positive nor negative$, $1 = slightly positive$, $2 = moderately positive$, $3 = extremely positive$). Ratings of platform content were averaged across social platforms. Among participants that used all three types of social media, internal consistency across platforms was alpha = .61 at Assessment 1 and .60 at Assessment 2.

Positively Biased Autobiographical Recall. Participants' autobiographical recall was assessed using 4 items. Participants were asked to be as detailed as possible in describing: "What are 3 specific negative things you remember happening related to COVID-19?" and "What are 3 specific positive things you remember happening related to COVID-19?" Participants were also asked to think about their lives since the "shelter-in-place" ordinances started, and to "Please describe 3 positive things that have

Table 1. Means, standard deviations, and correlations of study variables ($N = 705–1071$).

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Mean (SD) % (n)
1. Positive Recall Bias (T1)	—																		32% (343)
2. Positive Recall Bias (T2)	.14*	—																	33% (263)
3. Positive Media Bias (T1)	.02	.05	—																34% (359)
4. Positive Media Bias (T2)	.02	.05	.30*	—															28% (221)
5. Positive Affect (T1)	.06*	.05	.15*	.12*	—														28.62 (9.16)
6. Positive Affect (T2)	.05	.02	.12*	.15*	.78*	—													28.72 (8.91)
7. Negative Affect (T1)	−.10*	−.00	−.04	−.03	−.14*	−.18*	—												15.54 (7.68)
8. Negative Affect (T2)	−.05	.00	−.11*	.00	−.20*	−.22*	.71*	—											14.51 (6.53)
9. Dysphoria (T1)	−.09*	−.02	−.11*	−.11*	−.29*	−.37*	.74*	.65*	—										17.97 (8.72)
10. Dysphoria (T2)	−.07*	−.03	−.16*	−.08*	−.36*	−.39*	.61*	.69*	.83*	—									17.51 (8.25)
11. Age	.01	−.06	.11*	.10*	.18*	.17*	−.16*	−.16*	−.22*	−.21*	—								46.31 (15.77)
12. Female	−.02	−.03	.04	−.01	−.07*	−.05	−.01	−.01	.08*	.07*	.21*	—							58% (461)
13. SES	.04	.03	.05	.00	.11*	.08*	−.04	.04	−.13*	−.17	−.03	−.07*	—						4.86 (1.38)
14. Race (White)	−.05	.03	−.05	−.10*	.00	.00	−.06	−.05	−.02	.00	.21*	.10*	.02	—					78% (840)
15. Race (Black)	.04	−.04	.09*	.12*	.11*	.10*	.09*	.05	.04	−.02	−.10*	−.08*	−.03	−.59*	—				9% (94)
16. Race (AAPI)	.00	.01	.01	.04	−.09*	−.05	.02	.03	−.03	−.01	−.17*	−.04	.07*	−.51*	−.08*	—			7% (72)
17. Positive diagnosis-self	−.02	.02	.06	.03	.04	.03	.11*	.08*	.08*	.06	.00	−.02	.01	−.00	−.02	−.02	—		1% (5)
18. Positive diagnosis-other	−.06	−.02	.00	−.01	.06*	.06	.06	.02	.05	.01	−.01	.08*	.09*	−.02	.04	−.02	.09*	—	24% (257)
19. Disrupted future	−.04	−.06	−.03	−.05	−.03	−.06	.34*	.27*	.31*	.22*	−.07*	.05	−.00	−.02	.04	.02	.04	.09*	2.94 (1.36)

Note. Female: 0 = Not female, 1 = Female; Race (White): 0 = Not White, 1 = White; Race (Black): 0 = Not Black, 1 = Black; Race (AAPI): 0 = Not Asian or Pacific Islander, 1 = Asian or Pacific Islander; All means reflect scores prior to transformations. Frequencies for variables 1–4 reflect reports of positive bias, variables 18–19 reflect positive diagnosis. All controls (variables 11-19) are reported at the first assessment. Race (Other) and Race (Multi-racial) not related ($p > .05$) to any key predictor or outcome variables. See Table 1 of the supplemental section for frequencies of all demographic variables.

Time 1 Recall Bias N = 1071, Time 1 Media Bias N = 951, Time 2 Recall Bias N = 797, Time 2 Media Bias N = 705.

*$p < .05$.

happened" as well as to "Please describe 3 negative things that have happened". See supplemental Figure 1 for more information on "shelter-in-place" ordinances. Two independent trained raters tallied the number of internal details in participant responses using the Autobiographical Interview coding framework (Levine et al., 2002). Internal details include unique occurrences, observations, or thoughts that relate directly to the event, are specific to a time and place, and that convey a sense of re-experiencing of the personal past; these details can include event information, place, time, perceptions, or thoughts/emotions. The Autobiographical Interview coding framework has previously exhibited good interrater reliability and construct validity (Levine et al., 2002). Interrater reliability was found to be acceptable in the current study (see supplemental material for additional details on the coding). In line with previous research examining recall bias (e.g. Moradi et al., 2000; Zeitlin & McNally, 1991), the number of negative internal details was subtracted from the number of positive internal details to compute a positively biased autobiographical recall score, with positive scores (> 0) indicating a positive bias.

Positive and Negative Affect (PANAS). Participants reported their state affect using the 10-item PANAS (Watson et al., 1988). Participants rated the extent to which they were currently feeling positive (e.g. "proud", "excited") and negative (e.g. "upset", "nervous") emotions at the time of completing the survey using the 5-point scale. Responses were then summed to create positive affect and negative affect scores. The PANAS has demonstrated excellent psychometric properties, including high internal consistency (Watson et al., 1988). In the current study, for the negative affect subscale, internal consistency was alpha = .93 at Assessment 1 and .92 at Assessment 2. For the positive affect subscale, internal consistency was alpha = .92 at both assessments.

Dysphoria Symptoms. Participants' emotional and cognitive symptoms of depression and anxiety were assessed using the 10-item dysphoria subscale (e.g. "I felt inadequate") from the Inventory of Depression and Anxiety Symptoms (Watson et al., 2007). Participants were asked to rate how much they have felt or experienced each item during the past two weeks using the 5-point scale. Responses were summed to create a total score. The Inventory of Depression and Anxiety Symptoms has

demonstrated excellent construct validity and strong internal consistency (Watson et al., 2007). In the current study, internal consistency was alpha = .93 at Assessment 1 and .92 at Assessment 2.

Impact of COVID-19. Participants reported whether they had ever been diagnosed with a confirmed case of COVID-19 (0 = *no*, 1 = *yes*), personally knew anyone who had ever been diagnosed with a confirmed case of COVID-19 (0 = *no*, 1 = *yes*), and whether their future plans had been impacted or disrupted by COVID-19 (1 = *not at all*, 2 = *a little*, 3 = *a moderate amount*, 4 = *a lot*, 5 = *a great deal*).

Demographics. At Assessment 1, participants reported on their gender (1 = *Male*, 2 = *Female*, 3 = *other*) and race (1 = *American Indian/Alaskan Native*, 2 = *Asian American/Pacific Islander*, 3 = *Central/South American*, 4 = *Black/African American*, 5 = *White*, 6 = *Multi-racial*, 7 = *Other*). We combined low frequency (< .5% of the sample) racial categories of Central/South American and American Indian/Alaskan Native with "Other". We also assessed income (0 = *less than $19,999*, 1 = *$20,000–$39,999*, 2 = *$40,000–$69,999*, 3 = *more than $70,000*), education level (0 = *grade school*, 1 = *high school*, 2 = *college*, 3 = *graduate*), and employment status prior to the COVID-19 pandemic (0 = *unemployed*, 1 = *employed*), which were used to compute a composite index of socioeconomic status (SES) following the calculation used by Berzofsky et al. (2014).

Data analysis

Among the full sample of 1071 individuals, 2–4% were missing some sporadic item-level data on the multi-item questionnaires of interest. This missing item-level data was imputed using expectation maximisation for participants who were missing less than 50% of items on a given scored variable of interest.

We conducted multiple regression models to examine cross-sectional relations between positively biased social media consumption and positive affect, negative affect, and dysphoria symptoms, as well as the relations between positively biased autobiographical recall and these affective and dysphoric outcomes. Predictor variables in these analyses included the measure of positive bias (in social media consumption or autobiographical recall) as the independent variable, positive affect, negative affect, or dysphoria symptoms as the outcome, and the following control variables: age, sex, race, SES, and impact of COVID-19 (positive diagnosis-

self, positive diagnosis-other, disrupted future). Since we ran 6 separate regression models, we corrected for inflation of Type I error using the Benjamini-Hochberg method for correction of the false discovery rate. Negative affect and dysphoria symptoms had skewness ≥ 1 and hence were log transformed for analyses.

We conducted sensitivity analyses to examine whether our main findings from Assessment 1 were replicated in corresponding regressions using data from Assessment 2. We also conducted sensitivity analyses to examine whether our main findings replicated using cross-lagged multiple regression models to examine the prospective relation between positively biased social media consumption and positively biased autobiographical recall at Assessment 1 with positive affect, negative affect, and dysphoria symptoms at Assessment 2, while controlling for Assessment 1 level of the outcome as well as all other control variables.

Our power analysis indicated that power exceeded .99 to detect a small-to-moderate effect (see supplemental material).

Results

Means, standard deviations, and correlations for the study variables are summarised in Table 1. Additional sensitivity analyses as well as exploratory analyses examining moderation by age, race, and SES are presented in the supplemental materials.

Cross-sectional effects of positive biases on psychological functioning at assessment 1

Hypotheses 1-3: As indicated in Table 2, cross-sectional analyses at Assessment 1 indicated that more positively biased social media consumption was related to higher levels of positive affect ($b = 0.75$, $S.E. = 0.20$, $t(938) = 3.82$, $p < .001$, 95% CI [0.37,1.14], $sr^2 = .01$; Table 2) and lower levels of dysphoria symptoms ($b = -0.03$, $S.E. = 0.01$, $t(938) = -2.92$, $p = .006$, 95% CI [-0.04,-0.01], $sr^2 = .01$), but was not related to negative affect ($b = -0.01$, $S.E. = 0.01$, $t(938) = -0.87$, $p = .39$, 95% CI [-0.02,0.01], $sr^2 = .00$).

Hypotheses 4-6: At Assessment 1, positively biased autobiographical recall did not predict positive affect ($b = 0.14$, $S.E. = 0.08$, $t(1058) = 1.77$, $p = .08$, 95% CI [-0.02,0.28], $sr^2 = .00$), but did predict lower levels of negative affect ($b = -0.01$, $S.E. = 0.00$, $t(1058) = -2.97$, $p = .009$, 95% CI [-0.02,-0.00], $sr^2 = .01$), and lower levels of dysphoria symptoms ($b = -0.01$, $S.E. = 0.00$, $t(1058) = -2.51$, $p = .02$, 95% CI [-0.02,-0.00], $sr^2 = .01$; Table 2).

Sensitivity analyses

Cross-sectional effects of positives biases at assessment 2

Cross-sectional analyses at Assessment 2 indicated that positively biased social media consumption predicted higher levels of positive affect ($b = 0.74$, $S.E. = 0.22$, $t(692) = 3.32$, $p = .006$, 95% CI [0.30,1.18],

Table 2. Linear regressions examining effects of positive biases on psychological functioning at the first assessment.

Variable	Positively Biased Social Media Consumption (N = 951)						Positively Biased Autobiographical Recall (N = 1071)					
	Positive Affect		Negative Affect		Dysphoria		Positive Affect		Negative Affect		Dysphoria	
	B	SE	B	SE	B	SE	B	SE	B	SE	B	SE
Positive Bias	0.75**	0.20	−0.01	0.01	−0.03*	0.01	0.14	0.08	−0.01*	0.00	−0.01*	0.00
Age	0.11**	0.02	−0.00**	0.00	−0.01*	0.00	0.11**	0.02	−0.00**	0.00	−0.01**	0.00
Female	−2.33**	0.60	−0.00	0.00	0.08*	0.03	−1.83*	0.56	0.01	0.02	0.08*	0.02
Other	−1.03	3.60	−0.06	0.15	0.04	0.16	−4.42	3.16	0.02	0.13	0.04	0.14
SES	0.74**	0.21	−0.02	0.01	−0.04**	0.01	0.71**	0.20	−0.01	0.01	−0.04**	0.01
Race												
Black/African American	3.71**	1.03	0.08	0.04	0.03	0.05	3.83**	0.97	0.09*	0.04	0.02	0.04
Asian American/Pacific Islander	−2.70*	1.15	0.00	0.05	−0.10	0.05	−2.23*	1.11	−0.00	0.04	−0.10*	0.05
Multi-racial	−1.14	1.66	−0.07	0.07	−0.03	0.07	−1.21	1.65	−0.05	0.07	0.01	0.07
Other	0.41	1.83	−0.02	0.08	−0.07	0.08	−0.59	1.53	0.00	0.06	0.03	0.07
Positive diagnosis-self	3.70	3.96	0.51**	0.16	0.47*	0.17	5.01	3.99	0.50*	0.16	0.43*	0.17
Positive Diagnosis-other	0.99	0.67	0.02	0.03	0.02	0.03	1.20	0.64	0.01	0.03	0.01	0.03
Disrupted future	−0.07	0.21	0.09**	0.01	0.08**	0.01	−0.12	0.20	0.09**	0.01	0.09**	0.01

Note. Race variables use White as the reference group. Gender variables use Male as the reference group. Positive diagnosis-self: 0 = *no*, 1 = *yes*; Positive diagnosis-other: 0 = *no*, 1 = *yes*.
*p < .05, ** p < .001.

$sr^2 = .01$), but did not predict negative affect ($b = 0.01$, S.E. = 0.01, $t(692) = 0.61$, $p = .62$, 95% CI [−0.01,0.02], $sr^2 = .00$), or dysphoria symptoms ($b = −0.02$, S.E. = 0.01, $t(692) = −1.57$, $p = .33$, 95% CI [−0.03,0.00], $sr^2 = .00$).

At Assessment 2, positively biased autobiographical recall did not predict positive affect, $b = 0.05$, S.E. = 0.09, $t(784) = 0.60$, $p = .62$, 95% CI [−0.12,0.22], $sr^2 = .00$, negative affect, $b = 0.00$, S.E. = 0.00, $t(784) = 0.73$, $p = .62$, 95% CI [−0.00,0.01], $sr^2 = .00$, or dysphoria symptoms, $b = −0.00$, S.E. = 0.00, $t(784) = −0.50$, $p = .62$, 95% CI [−0.01,0.01], $sr^2 = .00$.

Prospective effects of assessment 1 positive biases on assessment 2 outcomes

Cross-lag analyses indicated that positively social media consumption did not prospectively predict positive affect ($b = 0.09$, S.E. = 0.15, $t(691) = 0.63$, $p = .70$, 95% CI [−0.20,0.39], $sr^2 = .00$), negative affect ($b = −0.01$, S.E. = 0.01, $t(691) = −1.43$, $p = .70$, 95% CI [−0.02,0.00], $sr^2 = .00$), or dysphoria symptoms ($b = −0.00$, S.E. = 0.01, $t(691) = −0.59$, $p = .70$, 95% CI [−0.02,0.01], $sr^2 = .00$).

Positively biased autobiographical recall did not prospectively predict positive affect ($b = −0.04$, S.E. = 0.06, $t(783) = −0.70$, $p = .70$, 95% CI [−0.15,0.07], $sr^2 = .00$), negative affect ($b = 0.00$, S.E. = 0.00, $t(783) = 0.38$, $p = .70$, 95% CI [−0.00,0.01], $sr^2 = .00$), or dysphoria symptoms ($b = −0.00$, S.E. = 0.00, $t(783) = −0.47$, $p = .70$, 95% CI [−0.01,0.00], $sr^2 = .00$).

Discussion

We hypothesised that positively biased social media consumption (Hypotheses 1-3) and positively biased autobiographical recall (Hypotheses 4-6) would be related to positive affect, negative affect, and dysphoria symptoms. These hypotheses were tested using the full sample at Assessment 1. In line with some of these hypotheses, we found that positively biased social media consumption was related to higher levels of positive affect (Hypothesis 1) and lower levels of dysphoria symptoms (Hypothesis 3), and that positively biased autobiographical recall was related to lower levels of negative affect and dysphoria symptoms (Hypotheses 5-6). We did not find relations between positively biased social media consumption and negative affect (Hypothesis 2) nor for relations between positively biased autobiographical recall and positive affect (Hypothesis 4).

The current study provides partial support for the hypothesis that positive biases may promote psychological functioning, as posited by theoretical frameworks such as the pandemic stress compensator framework (Buheji et al., 2020) and the social psychological model (Taylor et al., 1988). These frameworks suggest that positive biases may promote psychological functioning during chronic stressors by reinstating positive emotions, cognitions, and behaviours tied to the recalled experience (Contractor et al., 2021). The main findings of the current study align with previous studies conducted during COVID-19, including replicating those reporting that positive media consumption was related to higher positive affect (Chao et al., 2020) and that positive recall biases were related to lower depressive symptoms (Niziurski & Schaper, 2021). Likewise, our findings align with existing literature indicating psychological benefits of a variety of other positive biases, including optimistic bias and self-enhancement bias (Taylor et al., 1988). We discuss the clinical implications of our findings in our supplemental section.

Notably, evidence for the protective effects of positive biases in the current study was largely circumscribed to cross-sectional relations from Assessment 1. Sensitivity analyses mostly indicated null cross-sectional relations between positive biases and psychological functioning during Assessment 2, except for positively biased social media consumption predicting higher positive affect. Additionally, we found no prospective cross-lag effects of Assessment 1 positive biases on Assessment 2 psychological functioning. One possible explanation is that beneficial effects of positive biases on psychological outcomes might last less than 4 months, and that positive biases may have protective effects when used briefly during particularly emotionally exhausting periods of stressors but may not have sustained effects longer-term. Indeed, characteristics of COVID-19 stressors have been found to fluctuate over time, such that the employment, financial, and psychological "shocks" of COVID-19 were at their highest levels in spring of 2020 and reduced steadily in subsequent months (Chandola et al., 2020). These findings suggest that stressor characteristics, such as the degree to which people are affected by a given chronic stressor at a given time, may be important to consider in future research on the effects of positive biases.

Alternative explanations for our pattern of findings should also be considered. Unmeasured confounds, such as participants' frequency of social media use

or their exposure to different types or amounts of COVID-19 stressors (e.g. social, financial), may have unknowingly contributed to our examined relations between positive biases and psychological outcomes. It is also possible that individuals with higher levels of psychological functioning may be have higher levels of positive biases (i.e. mood congruency effects; Van Bockstaele et al., 2014). This may explain why our main findings did not replicate in prospective cross-lag analyses that controlled for reverse causality. An alternative possibility is that our measures did not fully capture the nuances of how positive bias functions in everyday life; future studies should consider alternative measurement approaches, such as in-person interviews or real-time behavioural observations. It is also noteworthy that the majority of individuals in the current sample were White (78%), suggesting that additional investigation is needed to establish the generalizability of our findings. Positive biases may have differing psychological benefits depending on factors such as culturally normative coping strategies and values or race-based health disparities and discrimination (see supplemental material for exploratory analyses examining race as a moderator).

Limitations

There are several limitations to the current study, some of which pertain to our measurement approach. First, we asked about autobiographical memories in an online text format as a necessary COVID-19 physical distancing precaution. This differed from the typical in-person format of the Autobiographical Interview and limited our ability to use follow-up probes to ensure participants described the full extent of their memory details. That is, participants' expression of memory details may have been a function of their verbosity or motivation. However, we accounted for within-subject verbosity by subtracting the number of negative internal details from the number of positive internal details. Moreover, majority of participants reported utilised only several words to describe each memory (see supplemental section), suggesting that there were not large between-subject differences in participant verbosity, but rather, this is a broader limitation of our online measurement approach. Second, by probing for positive and negative autobiographical memories separately, we may have inflated the extent to which participants expressed positive and/or negative

details. Third, our brief measure of social media consumption limited our ability to differentiate between usage of different types of social media. We did not define positive or negative social media content in our measure, which may have enabled participants to differ in how they self-defined or interpreted what constitutes positive or negative social media. Likewise, we did not assess whether participants' reports of positive or negative social media encompassed COVID-19 content as well as broader content, nor did we assess whether participants' social media consumption was intentional versus incidental (i.e. whether they intentionally sought out specific content or were presented with it incidentally as part of their social media timeline). This limited our ability to make clinical recommendations for social media consumption behaviours. Fourth, there are many positive biases, such as optimistic bias and self-enhancement bias, that were beyond the scope of the current study but that may be pertinent to future research on psychological functioning during chronic stressors (Taylor et al., 1988). Likewise, we assessed primarily for high arousal affective states and symptoms of psychopathology, but alternative domains of psychological functioning should be considered in future research.

Conclusion

The current study suggests that positively biased social media consumption may promote positive affect and lower dysphoria symptoms, while positively biased autobiographical recall may protect against negative affect and dysphoria symptoms. Benefits of positive biases for concurrent psychological functioning were observed primarily at Assessment 1. They were not replicated in prospective cross lag analyses with a lag of approximately 4 months. These findings provide support for theoretical frameworks on the psychological benefits of positive biases during chronic stressors.

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