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Self-Care Behaviors and Affect During the Early Stages of the COVID-19 Pandemic

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Objective: Self-care behaviors aimed at maintaining physical and mental health are often recommended during stressful contexts. We tested emotional predictors of self-care behaviors (healthy eating, exercise, engaging in a hobby, relaxation/meditation, time spent with a supportive person, talking online with friends/family) during the COVID-19 pandemic and their emotional consequences. We hypothesized a reciprocal within-person process whereby positive affect increases self-care behaviors (Hypothesis 1) and self-care behaviors increase positive affect while decreasing negative affect (Hypothesis 2). ***Method:*** A 10-day daily diary was completed by 289 adult participants in the United States during spring 2020 when counties in 40 out of 50 states had some form of stay-at-home orders. ***Results:*** Lagged analyses for Hypothesis 1 suggested that positive affect did not significantly predict residualized change in self-care behaviors; however, more intense negative affect predicted increased self-care behaviors from one day to the next. Concurrent analyses for Hypothesis 2 indicated most self-care behaviors were associated with more positive affect and some with less negative affect on the same day. Lagged analyses for Hypothesis 2 indicated that self-care behaviors largely did not predict residualized change in positive or negative affect from one day to the next. At the between-person level, people who experienced more positive affect engaged in more self-care behaviors across the sampling period. ***Conclusion:*** Self-care behaviors continue to have mental health benefits during stressful environments such as the COVID-19 pandemic and stay-at-home orders. Negative affect can play an adaptive role during times of stress by facilitating self-care.

Keywords: health behaviors, positive affect, negative affect, experience sampling, daily diary

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Stressful contexts can negatively impact physical and mental health (Cohen et al., 2019). However, prior research has suggested ways to support health under stressful conditions (Folkman, 2008). Self-care behaviors (e.g., exercise, relaxation) are often recommended within stressful contexts to sustain health and well-being. The COVID-19 pandemic is no exception: Major public health agencies recommended self-care behaviors (Centers for Disease Control & Prevention [CDC], 2020; Mayo Clinic Health System, 2020). Yet markedly little research has captured how affective phenomena both influence and are influenced by self-care behaviors during times of stress. Given the documented increases in reported psychological distress at the start of the COVID-19 pandemic (Aknin et al., 2022; Ettman et al., 2020), this investigation aimed to further the understanding of affective

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processes that contribute to the maintenance of health and well-being during stress.

Self-care behaviors are defined as behaviors generally beneficial for mental health. While traditional health behaviors are associated with physical health and disease prevention, self-care behaviors focus more on mental health promotion (Kobau et al., 2011). Self-care behaviors include behaviors commonly recommended by mental health professionals such as engaging in a hobby, relaxation/meditation, and supportive social interaction (Lejuez et al., 2001). Some traditional health behaviors fall under this umbrella, such as healthy eating and exercise, due to their known mental health benefits (Di Benedetto et al., 2020). During the COVID-19 pandemic, these recommendations were commonly endorsed by public health organizations to maintain mental health during this stressful time (CDC, 2020; Mayo Clinic Health System, 2020). In this investigation, we focused specifically on six self-care behaviors (healthy eating, exercise, engaging in a hobby, relaxation/meditation, time spent with a supportive person, and talking online with friends/family) based on three key criteria. First, they are consistent with sets of behaviors used in prior research examining affective processes and behavior (Aurora et al., 2022; Nylocks et al., 2018). Second, these behaviors are commonly suggested by therapists and counselors. Third, these behaviors are reliably measured in adults, including adults across the life span.

Does Affect Influence Self-Care Behaviors?

Prior research suggests elevations in positive affect (PA) may be effective at driving self-care behaviors. The discrete emotion of happiness is theorized to motivate goal-directed behaviors and a continuation of planful action (Oatley & Johnson-Laird, 1987). Experience-sampling research has begun to unpack these processes. For example, research in daily life has shown that PA co-occurs with health behaviors, such as healthy eating and exercise (Conner et al., 2015; Fredrickson et al., 2021), as well as engaging in a hobby and social interaction (Sonnentag et al., 2008; Zawadzki et al., 2015). When using a lagged model to predict changes in self-care behaviors over time, evidence suggests PA precedes the behaviors in time using samples of healthy adults, college students, and those with clinical depression and anxiety (Aurora et al., 2022; Nylocks et al., 2018). Unlike PA, negative affect (NA) has generally not been found to predict self-care over time (Aurora et al., 2022; Nylocks et al., 2018; Pressman et al., 2019) nor to predict self-care behaviors in daily life (Dunton et al., 2009; Fredrickson et al., 2021).

Do Self-Care Behaviors Influence Affect?

A breadth of research has suggested that engaging in self-care behaviors is associated with improved mood (Kim et al., 2017). Theory and empirical evidence suggest that after engaging in these self-care behaviors, individuals experience increased PA (Conn, 2010; Pressman et al., 2019). This relationship has been identified for several self-care behaviors such as physical activity (Schultchen et al., 2019), relaxation/mindfulness (Gotink et al., 2016), and social connection (Kok & Fredrickson, 2010). Increased PA is theorized to function as a reinforcement for self-care behaviors that then promotes those same behaviors in the future (Van Cappellen et al., 2018). In addition, theories underlying leading psychological interventions suggest that engaging in self-care behaviors may dampen elevated NA (e.g., behavioral activation; Lejuez et al., 2001). Meta-analyses suggest exercise significantly reduces symptoms of depression—even in nonpatient samples (Conn, 2010). Research in daily life has shown that following self-care behaviors, individuals may experience attenuated NA in the moment (Schultchen et al., 2019). Indeed, self-care recommendations during the COVID-19 pandemic emphasized these behaviors as central in decreasing distress and NA in addition to increasing happiness (CDC, 2020; Mayo Clinic Health System, 2020).

Current Investigation

The current investigation sought to test how self-care behaviors and emotional experiences relate dynamically to one another during the stressful context of the COVID-19 pandemic. During the first month or two into the pandemic (i.e., March and April 2020), the United States had some form of stay-at-home orders in counties from 40 out of the 50 states (CDC, 2021), and people were experiencing a spike in psychological distress (Aknin et al., 2022; Ettman et al., 2020). Self-care behaviors were conceptualized as actions recommended by medical organizations to maintain mental health during times of stress (e.g., CDC, 2020; Mayo Clinic Health System, 2020). A daily diary design was used to capture changes from one day to the next. Hypothesis 1 investigated the affective *predictors* of self-care behaviors. Consistent with prior studies before the COVID-19 pandemic, we hypothesized that more intense PA would predict increased self-care behaviors, but we did not have hypotheses about NA intensity. Hypothesis 2 investigated the affective *consequences* of self-care behaviors. Consistent with research on the hedonic benefits of self-care, we hypothesized that daily self-care behaviors would increase PA and decrease NA. Theoretical justifications for the covariates are included in the online supplemental materials.

Method

Transparency and Openness

The data collection and exclusion criteria for the parent study were preregistered on March 23, 2020 (https://osf.io/9hc7d?view_only=9db779cfe1e74ef1ab67f485df5fa09a). The parent study's target sample size of 1,200 was determined by the financial budget and not an a priori power analysis. The data analytic plan for the current investigation was not preregistered. The data sets, analysis scripts, and statistical output associated with this article are posted on the Open Science Framework (https://osf.io/f3nc7/?view_only=e85863dab8ca48989a97413ca4d272d0).

Participants and Procedures

The current investigation used participants in the control group from a larger parent study (Thompson et al., 2021). Participants for the parent study were recruited by the company Qualtrics to create an adult sample that was nationally representative in terms of sex, age, and education in the United States. Data collection was entirely online through Qualtrics surveys and occurred between March 24 and April 9, 2020. Unrelated to the current investigation, participants were first randomized to either a math

cognition intervention group or control group. Study procedures included an initial baseline survey with electronic informed consent followed by 10 days of diary surveys. This investigation relies on the baseline survey in which participants reported demographic information. All other questionnaires and health decision-making problems were unrelated to the current investigation (as well as math cognition training for those in the intervention group). In addition, this investigation focused on those participants who chose to continue participating in the study by completing a daily diary for 10 days. Diary surveys were sent to participants, beginning the day after baseline, at the same time each day: late afternoon or early evening (depending on participants' time zones). Surveys were identical across the 10 days, except for randomized order of the items. The study procedures were approved by the institutional review board at Kent State University (IRB #: 20–151). Details about the parent study's participants and procedures can be found in the Method section of Thompson et al. (2021).

A total of 2,693 participants from the parent study completed the online consent, were randomized, and started the baseline survey. Because this investigation only relied on daily diary data, we examined the subset of participants that agreed to complete diaries (n = 709). To ensure no influence of the parent study's math cognition intervention, we excluded participants in the active intervention group (n = 354). Per convention (e.g., Nylocks et al., 2018), less than 2 standard deviations below the mean compliance (M = 7.58, SD = 3.11, range = 1–10) was used as the cutoff to exclude participants with only one diary survey (n = 31). Participants were also excluded if they were missing on any demographic variables included as covariates (n = 35).[1] After all exclusions, this left a final sample size of N = 289 participants for the current investigation. See the online supplemental materials and Figure S1 for a summary of all the exclusion criteria. Diary compliance for the final sample was good at 79% (M = 7.88, SD = 2.57, range = 2–10), suggesting analyses could include up to 2,276 diary observations across the 289 participants.[2] Compliance by day ranged from 71% to 85% (see Table S2). In terms of demographics, the final sample was 55% female with a mean age of 50.7 years (SD = 16.1, range = 18–82). Most participants were White (78.5%), with small percentages of racial/ethnic minorities (7.3% Black, 5.2% Asian, 2.8% Hispanic, and 6.2% multiracial, other, or did not report). More detailed demographics are provided in the online supplemental materials.

Measures

Other than the demographic questions, which were administered in the baseline survey, only items from the diary survey are used in the current investigation. Reliability for diary scores was separated out into within-person (R_C) and between-person (R_{KF}) indices based on generalizability theory with a crossed design (Bolger & Laurenceau, 2013).

Affect

Momentary affect was assessed at the very beginning of each diary based on contemporary circumplex models of affect (Rafaeli et al., 2007). The instructions and items were the same as previous research (Aurora et al., 2022; Nylocks et al., 2018). Participants were prompted to rate "RIGHT NOW, to what extend do you feel" on a list of emotion words presented in random order using a 1–5 Likert scale: 1 = *not at all*, 2 = *a little*, 3 = *moderately*, 4 = *quite a bit*, and 5 = *extremely*. Mean scores were created for PA and NA and then separated out into within-person and between-person components via person-mean centering and mean aggregation, respectively. The within-person components assessed affect intensity in the moment, while the between-person components captured emotional tendencies over the sampling period. PA included the following six words: "relief," "enjoyment," "happiness," "amusement," "affection," and "content" (R_C = .71; R_{KF} = .99). NA included the following six words: "fear," "sadness," "distress," "guilt," "anger," and "disgust" (R_C = .68; R_{KF} = .99).

Self-Care Behaviors

After participants reported on their affect, they indicated whether they engaged in several behaviors. The instructions and items were the same as previous research (Aurora et al., 2022; Nylocks et al., 2018). Participants were asked whether they "performed any of the following actions or behaviors in the past day." Response options were either "no" coded as 0, "yes" coded as 1, or "does not apply" coded as missing.[3] Six self-care behaviors from prior research were used in the current investigation: "ate healthily," "exercised," "engaged in a hobby," "relaxation/meditation activities," "spent time with a supportive person," and "talked to a friend or family member on the phone or online." Five of the six items included a brief description of the behavior in parentheses to maximize the consistent interpretation of item language (see the online supplemental materials). Individual items were analyzed and separated into within-person and between-person components. Consistent with previous research, we also created sum scores to understand predictors of engaging in multiple self-care behaviors on the same day (Moore et al., 2022). This overall sum score is the total number of unique self-care behaviors used that day and indexes the variety of self-care behaviors engaged in. Score reliabilities were not calculated for the sum score of self-care behaviors because it was conceptualized as a formative count variable, not a reflective latent variable (Edwards & Bagozzi, 2000).

Data Analytic Strategy

To test our hypotheses, multilevel structural equation modeling (SEM) was applied with person as the nesting variable (statistical details are provided in the online supplemental materials). We first used lagged analyses to test a reciprocal within-person process whereby positive affect increases self-care behaviors (Hypothesis 1) and self-care behaviors increase positive affect while decreasing negative affect (Hypothesis 2). Seven

[1] For example, n = 25 participants did not provide a valid zip code to calculate their population density with.

[2] Note, the exact number of diary observations and participants included differs across the models slightly due to item-level missing data and lagged associations; these numbers are reported in the tables reporting each set of model results.

[3] The percentage of diaries in which participants responded with "does not apply" ranged from 0.8% to 1.4% across the self-care behaviors.

separate multilevel SEMs were applied with the self-care sum score and the six individual behaviors. The lagged analyses involved cross-lagged (i.e., yesterday) within-person PA and NA as predictors of concurrent (i.e., today) self-care behaviors as well as cross-lagged (i.e., yesterday) within-person self-care behaviors as a predictor of concurrent (i.e., today) PA and NA. The autoregressive lags (i.e., yesterday) were included as additional covariates to capture residualized change. Lags could span longer than a day due to missing data (e.g., Tuesday's affect predicting Thursday's self-care behavior if Wednesday's report was missing).

For self-care behaviors predicting PA and NA (i.e., Hypothesis 2), we conducted concurrent analyses in addition to lagged analyses. Another name for concurrent analyses is "same-day" analyses since they involve predictor scores and outcome scores from the same diary report (e.g., Day 3 of the diary). We conducted concurrent analyses here because the predictor of self-care behaviors was assumed to take place between the previous day's diary report and the same day's diary report (e.g., between Day 2 report and Day 3 report). Again, seven separate multilevel SEMs were applied for each self-care variable. Figure 1 displays a multilevel path diagram of the concurrent and lagged analyses applied to the self-care sum score (covariates are excluded). We interpret the between-person associations between self-care behaviors and affect in these concurrent analyses because the between-person associations in the lagged analyses are slightly biased due to excluding the first day of the diary for each participant.

Results

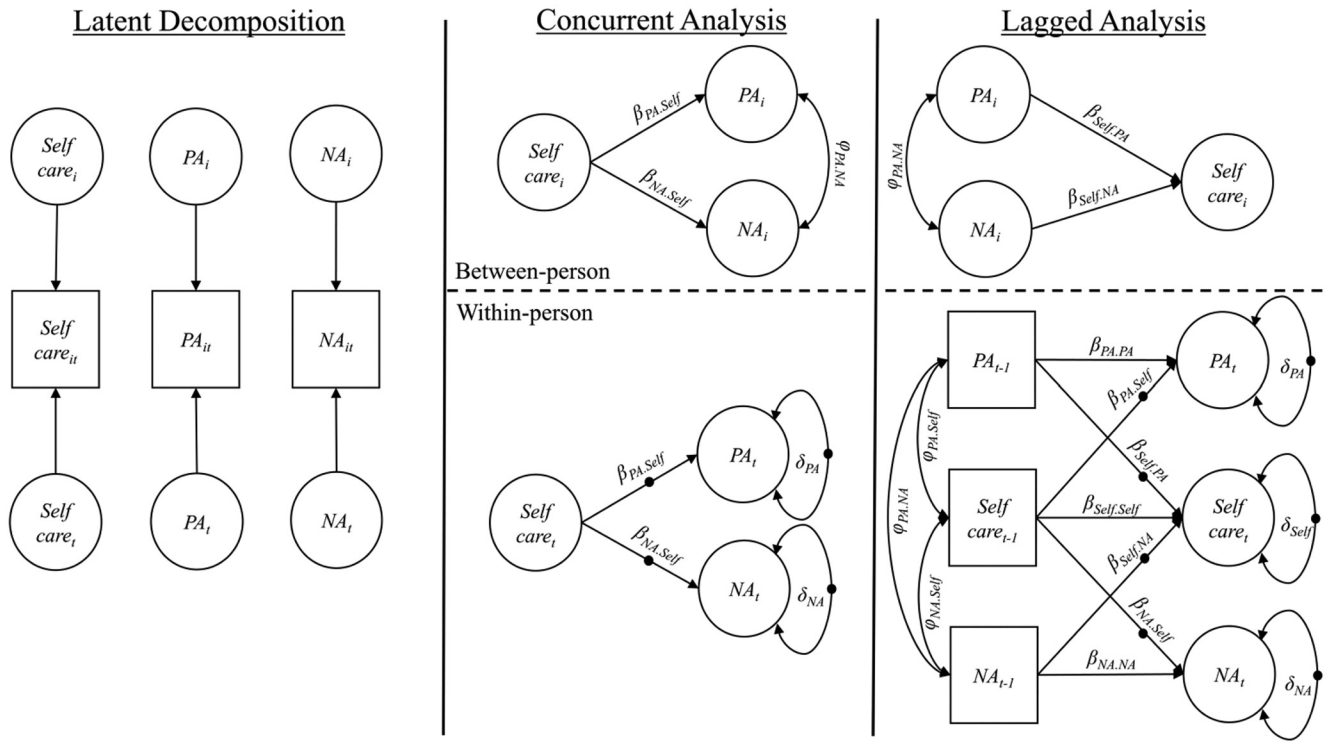
Descriptive Statistics

Table 1 presents multilevel descriptive statistics for PA, NA, the self-care sum score, and each of the individual self-care behaviors. In general, the within-person correlations are weaker than their between-person counterparts. PA was positively associated with the self-care sum score, while NA was negatively associated; however, the effect sizes for PA were more than double that of NA. The associations among the individual behaviors are almost all positive and significant. The average PA score on any given day was not much larger than that of NA. The average self-care sum score on any given day was 3–4 out of 6, suggesting a rate of behaviors over 50%. The most frequent individual behaviors were the two involving social interaction.

Hypothesis 1: Affective Predictors of Self-Care Behaviors

We first tested Hypothesis 1 to identify whether PA predicted self-care behaviors. The top of Table 2 presents the lagged within-person analysis results for the self-care sum score and each of the six individual self-care behaviors (see Tables S2–S8 for the 95% credible intervals). Within-person PA the day before was not associated with the self-care sum score or any of the individual behaviors. On the contrary, more intense NA the day before was significantly

Figure 1
Multilevel Path Diagram of the Concurrent and Lagged Analyses



Note. PA = positive affect; NA = negative affect; i = individual person; t = time in days; β = regression coefficient; φ = covariance; δ = residual variance. Arrows with black dots in the middle indicate random effects with estimated variance components. Covariates are excluded for readability.

Table 1
Multilevel Descriptive Statistics

Variables	1	2	3	4	5	6	7	8	9
1. Positive affect		−.32***	.28***	.13*	.26***	.21***	.31***	.09	.08
2. Negative affect	−.27***		−.08	−.19***	−.01	−.09	−.08	.05	.03
3. Self-care sum score	.19***	−.08***		.62***	.62***	.65***	.75***	.63***	.62***
4. Healthy eating	.09***	−.06**	.47***		.41***	.21***	.34***	.23***	.17**
5. Exercise	.07***	−.05*	.52***	.13***		.30***	.40***	.09	.14*
6. Hobby	.14***	−.04	.54***	.09***	.15***		.43***	.28***	.32***
7. Relax/Meditate	.07***	−.05**	.53***	.13***	.12***	.15***		.38***	.34***
8. Time with support	.10***	−.03	.51***	.09***	.07***	.13***	.07***		.55***
9. Talk with friend/Family	.08***	−.02	.49***	.05**	.07***	.12***	.07***	.20***	
M	2.13	1.92	3.67	0.66	0.46	0.65	0.49	0.68	0.73
SD	0.89	0.96	1.69	0.47	0.50	0.48	0.50	0.47	0.44

Note. Within-person correlations are below the diagonal; between-person correlations are above the diagonal.
* $p < .05$. ** $p < .01$. *** $p < .001$.

associated with a greater rate of overall self-care behaviors as well as specifically healthy eating and time with a supportive person. Days into the diary was not a significant predictor of residualized change for the self-care sum score and most of the individual behaviors, except for relaxation/meditation.

The top of Table 3 presents the between-person analysis results for the self-care sum score and each of the six individual self-care behaviors (see Tables S9–S15 for the 95% credible intervals). At the between-person level, older adults engaged in a greater rate of overall self-care behaviors across the sampling period. Older adults also tended to engage in healthy eating more frequently across the sampling period, while women more frequently engaged in relaxation/meditation, time with a supportive person, and talking with friends/family online. Participants living in more population-dense areas of the United States also reported more frequent healthy eating. The between-person covariate of number of diaries completed (i.e., compliance) was not significant for any self-care outcome.

Hypothesis 2: Affective Consequences of Self-Care Behaviors

We next tested Hypothesis 2 by investigating the impact of self-care behaviors on PA and NA. We conducted both lagged and concurrent within-person analyses.

Lagged Analyses

The middle of Table 2 presents the lagged within-person analysis results testing whether self-care behaviors predicted residualized change in PA over time. The self-care sum score the day before was not significantly associated with residualized change in PA. Of the individual self-care behaviors, only relaxation/meditation was a significant predictor of PA. The bottom of Table 2 presents the lagged analysis results testing whether self-care behaviors predicted residualized change in NA over time. The self-care sum score the day before was not significantly associated with residualized change in NA, and none of the individual behaviors were significant predictors of residualized change in NA.

Table 2
Lagged Within-Person Standardized Regression Coefficients From the Multilevel SEMs

$N = 279$ ($n = 1{,}938$) Predictors	Self-care$_t$ as outcome						
	Sum score$_t$	Healthy eating$_t$	Exercise$_t$	Hobby$_t$	Relax/meditate$_t$	Time with support$_t$	Talk with friend/family$_t$
Positive affect$_{t-1}$	<−0.01	<.01	0.01	0.06	−0.01	−0.05	0.05
Negative affect$_{t-1}$	**0.08**	**0.17**	−0.03	0.03	0.01	**0.18**	0.05
Self-care behavior$_{t-1}$	−0.06	−0.06	−0.04	**−0.09**	−0.04	−0.05	**−0.10**
Days into diary$_{t-1}$	0.01	0.02	0.02	−0.01	**0.07**	0.08	−0.04
$N = 279$ ($n = 1{,}938$) Predictors	Positive affect$_t$ as outcome						
	Sum score$_{t-1}$	Healthy eating$_{t-1}$	Exercise$_{t-1}$	Hobby$_{t-1}$	Relax/meditate$_{t-1}$	Time with support$_{t-1}$	Talk with friend/family$_{t-1}$
Self-care behavior$_{t-1}$	0.02	<0.01	0.03	−0.01	**0.06**	−0.02	<−0.01
Positive affect$_{t-1}$	**0.07**	**0.07**	**0.07**	**0.08**	**0.07**	**0.08**	**0.07**
Days into diary$_{t-1}$	**−0.06**	**−0.06**	**−0.06**	**−0.06**	**−0.06**	**−0.07**	**−0.06**
$N = 279$ ($n = 1{,}938$) Predictors	Negative affect$_t$ as outcome						
	Sum score$_{t-1}$	Healthy eating$_{t-1}$	Exercise$_{t-1}$	Hobby$_{t-1}$	Relax/meditate$_{t-1}$	Time with support$_{t-1}$	Talk with friend/family$_{t-1}$
Self-care behavior$_{t-1}$	0.01	0.02	0.02	0.04	−0.02	0.02	0.02
Negative affect$_{t-1}$	0.07	**0.09**	**0.09**	0.06	**0.10**	0.08	**0.07**
Days into diary$_{t-1}$	−0.03	−0.02	−0.03	−0.02	−0.03	−0.03	−0.02

Note. SEM = structural equation modeling. Estimates in bold have 95% Bayesian credible intervals that do not include zero and are deemed statistically significant. t = today; t-1 = yesterday.

Table 3
Between-Person Standardized Regression Coefficients From the Multilevel SEMs

$N = 279$ ($n = 1{,}938$) Predictors	Self-care as outcome (from lagged analysis)						
	Sum score$_\mu$	Healthy eating$_\mu$	Exercise$_\mu$	Hobby$_\mu$	Relax/meditate$_\mu$	Time with support$_\mu$	Talk with friend/family$_\mu$
Positive affect$_\mu$	**0.30**	**0.19**	**0.30**	**0.25**	**0.35**	**0.20**	0.14
Negative affect$_\mu$	0.02	**−0.14**	0.06	0.01	0.05	0.07	0.09
Age (10-year units)	**0.18**	**0.30**	0.01	0.06	0.05	0.08	0.02
Female	0.10	−0.05	<0.01	0.06	**0.21**	**0.21**	**0.19**
Population density	0.04	**0.18**	−0.10	0.07	0.01	−0.05	−0.02
Compliance	0.03	−0.04	−0.02	−0.01	0.07	0.04	0.09
$N = 289$ ($n = 2{,}275$) Predictors	Positive affect as outcome (from concurrent analysis)						
	Sum score$_\mu$	Healthy eating$_\mu$	Exercise$_\mu$	Hobby$_\mu$	Relax/meditate$_\mu$	Time with support$_\mu$	Talk with friend/family$_\mu$
Self-care behavior$_\mu$	**0.16**	**0.14**	**0.22**	0.09	**0.27**	0.08	0.04
Age (10-year units)	−0.05	−0.07	<−0.01	−0.01	−0.03	−0.01	−0.01
Female	**−0.13**	−0.10	**−0.11**	−0.09	**−0.16**	**−0.15**	−0.11
Population density	−0.05	−0.09	−0.03	−0.06	−0.05	−0.04	−0.06
Compliance	−0.03	−0.05	−0.05	−0.04	−0.05	−0.07	−0.05
$N = 289$ ($n = 2{,}275$) Predictors	Negative affect as outcome (from concurrent analysis)						
	Sum score$_\mu$	Healthy eating$_\mu$	Exercise$_\mu$	Hobby$_\mu$	Relax/meditate$_\mu$	Time with support$_\mu$	Talk with friend/family$_\mu$
Self-care behavior$_\mu$	−0.01	**−0.13**	0.03	−0.04	−0.05	0.04	0.03
Age (10-year units)	**−0.13**	−0.09	**−0.14**	**−0.14**	**−0.13**	**−0.15**	**−0.14**
Female	0.07	0.06	0.07	0.06	0.08	0.07	0.06
Population density	0.02	0.04	0.02	0.02	0.02	0.02	0.02
Compliance	−0.01	−0.02	<−0.01	−0.01	−0.02	−0.01	−0.01

Note. SEM = structural equation modeling. Estimates in bold have 95% Bayesian credible intervals that do not include zero and are deemed statistically significant. μ = between-person component after latent decomposition.

PA Concurrent Analysis

The top of Table 4 presents the concurrent within-person analysis results testing the influence of self-care behaviors on PA (see Tables S16–S22 for the 95% credible intervals). The within-person self-care sum score was significantly associated with more intense PA. All six of the individual behaviors were associated with more intense PA on the same day. The within-person covariate of days into the diary was also significant, indicating people experienced less intense PA as the diary progressed along the 10-day sampling period.

The middle of Table 3 presents the between-person analysis results for the self-care sum score and each of the six individual self-care behaviors with PA. At the between-person level, the rate of overall self-care behaviors was significantly associated with more PA. People with a higher rate of self-care behaviors across the sampling period tended to experience greater PA. Half of the individual self-care behaviors—healthy eating, exercise, and relaxation/meditation—were significantly associated with more PA. The covariates of number of diaries completed (i.e., compliance) and age were not significant. On the other hand, sex was significant in four of the models. Women tended to report less PA across the sampling period.

NA Concurrent Analysis

The bottom of Table 4 presents the concurrent within-person analysis results testing the association of self-care behaviors with NA. The within-person self-care sum score was significantly associated with less NA. In terms of the individual behaviors, exercise

Table 4
Concurrent Within-Person Standardized Regression Coefficients From the Multilevel SEMs

$N = 289$ ($n = 2{,}275$) Predictors	Positive affect$_t$ as outcome						
	Sum score$_t$	Healthy eating$_t$	Exercise$_t$	Hobby$_t$	Relax/meditate$_t$	Time with support$_t$	Talk with friend/family$_t$
Self-care behavior$_t$	**0.18**	**0.08**	**0.08**	**0.15**	**0.05**	**0.10**	**0.10**
Days into diary$_t$	**−0.13**	**−0.13**	**−0.13**	**−0.12**	**−0.12**	**−0.12**	**−0.12**
$N = 289$ ($n = 2{,}275$) Predictors	Negative affect$_t$ as outcome						
	Sum score$_t$	Healthy eating$_t$	Exercise$_t$	Hobby$_t$	Relax/meditate$_t$	Time with support$_t$	Talk with friend/family$_t$
Self-care behavior$_t$	**−0.06**	−0.03	**−0.05**	−0.01	**−0.05**	−0.03	0.01
Days into diary$_t$	**−0.05**	**−0.05**	**−0.05**	**−0.05**	**−0.04**	**−0.05**	**−0.04**

Note. SEM = structural equation modeling. Estimates in bold have 95% Bayesian credible intervals that do not include zero and are deemed statistically significant. t = today.

and relaxation/meditation were associated with less intense NA on the same day. The within-person covariate of days into the diary was significant, indicating people experienced slightly less intense NA as the diary progressed along the 10-day sampling period.

The bottom of Table 3 presents the between-person analysis results for the self-care sum score and each of the six individual self-care behaviors with NA. At the between-person level, the self-care sum score was not significantly associated with NA. Younger adults tended to report more NA across the sampling period in all models but one. The between-person covariates of sex, population density, and number of diaries completed (i.e., compliance) were not significant in the models.

Discussion

The current investigation tested how emotional experiences and self-care behaviors related to one another in daily life during the start of the COVID-19 pandemic. We investigated affect as a predictor of self-care behaviors (i.e., Hypothesis 1) and affect as a consequence of self-care behaviors (i.e., Hypothesis 2). Self-care behaviors included healthy eating, exercise, engaging in a hobby, relaxation/meditation, time with a supportive person, and talking online with friends/family. Although prior research has examined affect-behavior dynamics, this investigation is one of the first to test associations within a stressful context. Our results suggest that the context influences the way in which affective processes may drive the use of self-care behaviors, in that more intense negative (rather than positive) affect predicted use of behaviors from one day to the next. However, consistent with prior research, self-care behaviors were generally associated with increased PA on the same day they were reported. Taken together, these findings support public health recommendations to engage in self-care behaviors as a way to increase positive emotions and manage distress. Specifically, our results are in line with established treatment recommendations for depression (i.e., behavioral activation; Lejuez et al., 2001) and suggest similar recommendations may be beneficial for the general population. Our findings emphasize that these benefits may only be short term, influencing emotional experiences within a day and not across days. However, consistent engagement in self-care behaviors might help sustain PA across several days.

Dynamic Changes in Self-Care Behaviors

We did not find support for Hypothesis 1 that within-person PA would predict increases in self-care behaviors from one day to the next, and this was surprising given that positive emotions can have salient benefits during times of stress (Folkman, 2008). Although several previous studies have found lagged associations between PA and health behaviors (Pressman et al., 2019), these have included multiple assessments a day allowing for lags within a day (Nylocks et al., 2018; Schultchen et al., 2019), rather than the lags across days tested in the current investigation. Consistent with this interpretation, several other daily diary studies did not find that PA influenced behaviors from one day to the next (Conner et al., 2015; Fredrickson et al., 2021; Zawadzki et al., 2015). These differences suggest that frequency in sampling could be responsible for discrepancies between findings.

We found that within-person NA the day before predicted unique increases in overall self-care behaviors over time—while controlling for PA. The same NA effect was found for the individual self-care behaviors of healthy eating and spending time with a supportive person. The healthy eating finding is surprising given prior research finding an opposite, inverse association (Kiviniemi et al., 2011) or null association (Schultchen et al., 2019) between NA and eating fruits and vegetables. However, local stay-at-home orders at the beginning of the COVID-19 pandemic resulted in people eating healthier due to cooking their own food and not going out to eat at restaurants/bars (Flanagan et al., 2021). It is possible this lifestyle shift also changed the day-to-day dynamics between NA and healthy eating. The finding regarding time spent with a supportive person is less surprising given prior research that people may use social support as a way to downregulate their NA (Seidman et al., 2006). This supports functional theories of discrete emotions that emphasize the adaptive role negative emotions can play in coping (e.g., Coifman et al., 2016). The stressful environment of the COVID-19 pandemic, as well as health promotion messaging relating to self-care, could help to explain these findings.

We found support for Hypothesis 2 that when a person engaged in more self-care behaviors, they reported more intense PA the same day. The same PA effect was found for each of the six individual self-care behaviors. These results add to the large body of literature suggesting that health behaviors and PA are linked together at the within-person level (Pressman et al., 2019). These results also support the continued mental health benefits of self-care behaviors during stressful contexts like the beginning of the COVID-19 pandemic. This is important evidence given times of stress are exactly when self-care behaviors are most commonly recommended (CDC, 2020; Mayo Clinic Health System, 2020). Other than relaxation/meditation, we did not find evidence that self-care behaviors impacted within-person PA from one day to the next (lagged analysis). This suggests the hedonic effects of some self-care behaviors are short-lived and have waned by the next day.

We found that less intense NA was reported on days when people engaged in more overall self-care behaviors, suggesting a benefit to mood. The effect size was smaller compared to PA, which is consistent with mostly null associations for the individual self-care behaviors as well as prior mixed findings. For example, some studies have found that physical activity decreases NA over time (Fredrickson et al., 2021), whereas other studies have found no effect (Wichers et al., 2012). The lack of an effect for time with a supportive person was surprising given the mood benefits of positive social interactions documented in the experience-sampling literature (Pemberton & Fuller Tyszkiewicz, 2016). The fact that many of these social interactions may have been online or virtual during the COVID-19 pandemic could have contributed to the weaker hedonic benefits. When using lagged analyses, self-care behaviors did not predict NA from one day to the next, suggesting that benefits would be restricted within the same day.

Individual Differences in Self-Care Routines

People who engaged in more overall self-care behaviors—as well as the individual self-care behaviors of eating fruits and vegetables, exercising, and relaxation/meditation—tended to experience higher PA across the sampling period. The between-person effect sizes were the largest observed in the current investigation.

Hence, people who had consistent, daily routines involving self-care behaviors were the same people who had the highest PA tendencies. This is consistent with past experience-sampling research investigating self-care behaviors and affect (Aurora et al., 2022; Nylocks et al., 2018). In contrast, there was no significant between-person association for NA tendencies and overall self-care behaviors. The only individual behavior linked to individual differences in NA tendencies was healthy eating, again highlighting the unique role food might have played at the beginning of the COVID-19 pandemic. Note that these between-person associations do not have any temporal precedence, and thus their directionality is unclear and could go from affect to self-care behaviors.

The dynamic changes in self-care behaviors over time (i.e., within-person) and individual differences in self-care routines (i.e., between-person) complement each other in order to understand how self-care behaviors benefit mental health. Although the within-person effect sizes were small, the between-person effect sizes were large. For example, a person who engaged in all six self-care behaviors each day for the 10 days was predicted to have a PA score .96 standard deviations higher than someone who engaged in no self-care behaviors across the 10 days. The difference is almost a whole standard deviation and is approaching a Cohen's *d* of 1.0. Therefore, the small benefits of self-care behaviors on any given day clearly add up to large benefits when consistent over time.

Limitations and Conclusions

The current investigation had several limitations. First, the daily behavior items were dichotomous to reduce participant burden. We were not able to assess the intensity or duration of participants' self-care behaviors as each behavior was measured with a yes/no response scale. Second, it is possible that some participants' endorsements of the self-care items involved daily hassles instead of healthy self-care. For example, the item "talked to a friend or family member on the phone or online" might have reflected interpersonal conflict or corumination for some participants. However, that item's positive within-person association with PA suggests most participants did not endorse the item in that way. Third, we did not include all relevant self-care behaviors associated with mental health promotion, and future studies should expand the construct breadth with additional behaviors. For example, sleep quality and quantity are repeatedly linked to decreased distress (Besedovsky et al., 2019), but sleep is best assessed with morning diaries, which we did not implement here. Fourth, we did not explicitly measure individual differences in stress exposure or stress reactivity to the COVID-19 pandemic. Inevitably, some participants experienced more stress than others, which may not be entirely reflected in their daily ratings of negative affect. Fifth, although the sample was intended to match national distributions on sex, age, and education, the lowest level of education was underrepresented (2% instead of 12%) due to difficulties in recruitment. It is possible that people with lower educational attainment and socioeconomic status might not experience as many hedonic rewards from self-care behaviors given they tend to perceive fewer practical benefits from them (Pampel et al., 2010).

In sum, given the psychological distress and social isolation commonly reported at the start of the COVID-19 pandemic in the United States (Aknin et al., 2022; CDC, 2021), it is imperative to understand whether people continue to benefit from self-care behaviors during such stressful times. We found that self-care behaviors (healthy eating, exercise, engaging in a hobby, relaxation/meditation, time spent with a supportive person, talking online with friends/family) were associated with increased PA and decreased NA on the same day. When looking at the individual behaviors, benefits for PA were the most consistent. However, the benefits of self-care behaviors on affect did not extend from one day to the next, highlighting the importance of consistent engagement in such behaviors each day to maintain emotional well-being. Thus, individuals could benefit most from daily routines involving self-care behaviors during times of stress. Contrary to prior experience sampling research, we also found that NA the day before predicted a greater rate of self-care behaviors. During times of stress, NA may play an adaptive role for some people by activating concern for one's well-being and the initiation of self-care behaviors like healthy eating and time with a supportive person. Taken together, our findings suggest that consistent self-care behaviors each day are effective at regulating mood during stressful situations like the start of the COVID-19 pandemic.

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