

Supplement to:

Mental health improvement after the COVID-19 pandemic in individuals with psychological distress

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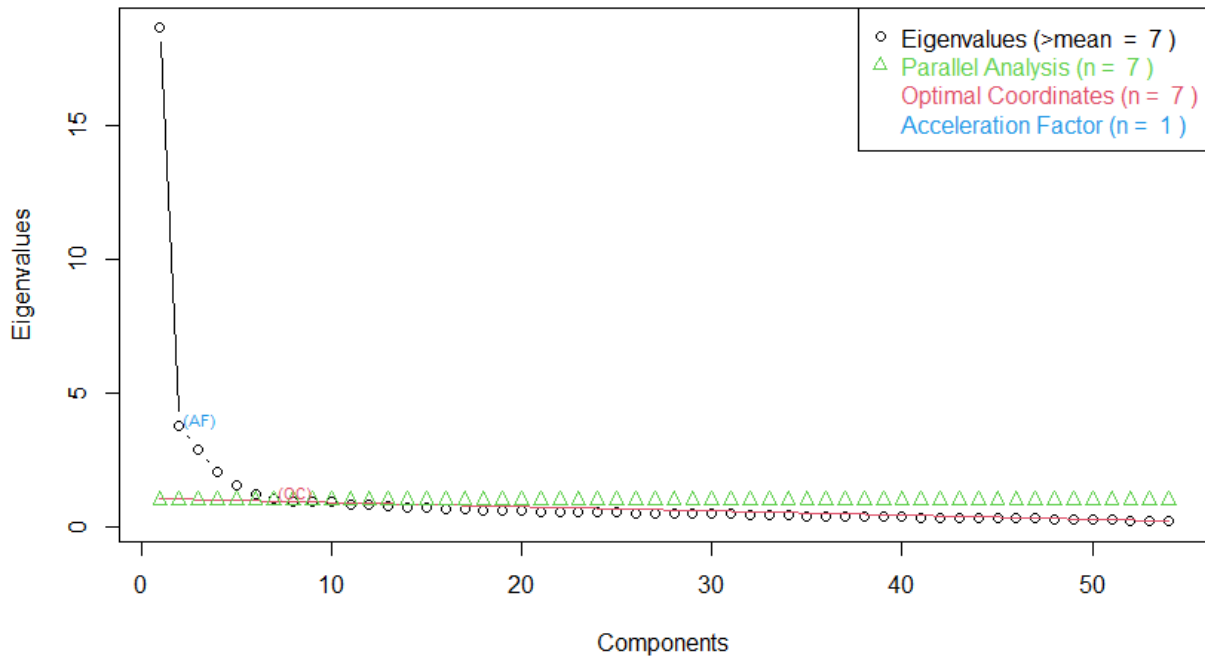
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Supplementary Materials and Methods

Questionnaires

Exploratory Factor Analysis. We subjected the item-level data of the ASI-3, PSWQ, and STAI-T during the last assessment to an exploratory factor analysis using the nFactors package. Visual inspection of the scree plot (see below) and the acceleration criterion indicate a one-factor-solution. According to further indicators, extracting seven factors would also be possible but explained variance is already strongly diminished for factor two.

Figure S1: *Scree Plot with Decision Criteria*



Matching Variables. To implement the quasi-longitudinal matching procedure described in the manuscript, the following variables were acquired during the last assessment at pandemic downturn and subjected to an elastic net regression model to predict the change from pre-pandemic strain to downturn:

1. The Connor-Davidson Resilience Scale (CD-RISC; Campbell-Sills & Stein, 2007; Wollny & Jacobs, 2023) with its total score and the subfacets flexibility, self-efficacy, self-regulation, optimism, and focus,
2. the Somatic Symptom Scale-8 (Gierk et al., 2014; Narrow et al., 2013),

3. the Fear of Covid-19 Scale (Ahorsu et al., 2022; Hein et al., 2021),
4. the two-item version of the Patient Health Questionnaire (PHQ-2; Löwe et al., 2005),
5. the state subscale of the State-Trait Anxiety Inventory (STAI-S; Laux et al., 1981; Spielberger et al., 1970),
6. the short version of the Intolerance of Uncertainty Scale (IUS-12; Carleton et al., 2007; Dietmaier et al., 2008) with its two factors Prospective Anxiety (IUS-P) and Inhibitory Anxiety (IUS-I),
7. the Illness Attitude Scales (IAS; Hiller & Rief, 2004; Kellner, 1987),
8. the Center for Epidemiologic Studies Depression Scale (CES-D Scale; Radloff, 1977) in its German short version “Allgemeine Depressionsskala Kurzform” (ADS-K; Hautzinger & Bailer, 1993),
9. and the Loneliness and Isolation during Social Distancing (LISD; Gründahl et al., 2022) with its two state factors (“lonely and isolated” & “connected and supported”) and three trait factors (“loneliness and isolation”, “sociability and sense of belonging”, and “social closeness and support”).

Furthermore, we acquired information on participants’ vaccination status, belonging to a COVID-19-related risk group, prevalence of COVID-19 infections in the social environment, size of current household, and daily structure. We also asked subjects to estimate their perceived personal risk due to the COVID-19 pandemic as well as their perceived change in social and safety behavior, emotional functioning, sleep, and living circumstances due to the COVID-19 pandemic and associated restrictions within the last 6 months. Lastly, we asked participants to indicate their frequency of consuming media updates related to the COVID-19 pandemic and assessed demographic information like age, gender, citizenship, and occupation status.

As noted in the manuscript, the change in strain was best predicted by individual PHQ2, IUS-I, ADS-K, and a single item describing the perceived change in one’s emotional mental state due to the COVID-19 pandemic within the last 6 months (i.e., spring to fall 2021).

Data Processing

Longitudinal Matching. As mentioned in the manuscript, individuals of sample 2 participated anonymously, providing code words created from private information. During both assessments of sample 2, we asked participants to indicate their birthdate and the last two letters of the first names of each of their parents. If individuals gave inconsistent answers across time points, codes remained unmatched ($N = 465$). For every unmatched code of the last assessment, unmatched codes of the prior assessment were checked for concordance. Considering the two strings provided (one for each parent) and the three parts of the birthdate (day, month, and year separately), we calculated the number of mismatches across these five pieces. If a pair of codes had one or two mismatches and was the only pair with such high concordance, the pair was accepted preliminarily and flagged for manual inspection ($N = 262$ flagged; $N = 260$ accepted). For the remaining codes, all possible matches with the highest available concordance were manually screened. Further matches were accepted at face validity ($N = 203$). Examples of manual rematching include discrepancies that have occurred by a plausible typo (e.g., day “22” & “23”), typing the current year instead of one’s birth year, or if participants seemed to have reported the *first* two letters of either parent during one occasion, enabling a plausible reconstruction of the parent’s name (e.g., father “PE” & “ER” = Peter).

Supplementary Results

Considering adverse life events (*ALE*), we found an unexpected five-way interaction of $ALE \times time \times gender \times age \times gap$ ($F(1.77, 515.81) = 3.22, p = .047, \eta_p^2 = .01$). Individuals with an *age* below or equal to the median showed only a main effect of *time* ($F(1.78, 317.12) = 12.14, p < .001, \eta_p^2 = .06$) and a marginal main effect of life events ($F(1, 178) = 2.84, p = .094, \eta_p^2 = .02$). Participants with an age above the median exhibited a slightly more pronounced effect of *time* ($F(1.75, 198.15) = 14.94, p < .001, \eta_p^2 = .12$) but also an interaction of *time* and *gap* ($F(1, 113) = 6.23, p = .014, \eta_p^2 = .05$) and a marginal four-way interaction with

time, gap, gender and ALE ($F(1.75, 198.15) = 2.90, p = .064, \eta_p^2 = .03$). Follow-up analyses indicated that only older males showed the interaction between ALE and gap ($F(1, 40) = 5.30, p = .027, \eta_p^2 = .12$) while older females did not ($F(1, 73) = 1.65, p = .203, \eta_p^2 = .02$). Finally, this interaction could be traced back to the ALE only showing a tendency for a main effect for older males with a low gap between first and last assessment ($r = -.54, p = .086$) but not when gap between first and last assessment was high ($r = -.01, p = .964$).

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