Time Perspective predicts levels of Anxiety and Depression during the COVID-19 outbreak:

A cross-cultural study

Luigi Micillo¹, Pier-Alexandre Rioux², Esteban Mendoza², Sebastian L. Kübel^{3,4}, Nicola Cellini^{1,5,6},
Virginie Van Wassenhove⁷, Simon Grondin², Giovanna Mioni¹.

¹Department of General Psychology, University of Padova, Padova, Italy

²École de Psychologie, Université Laval, Québec, QC, Canada

³Institute for Frontier Areas of Psychology and Mental Health, Freiburg, Germany

⁴Max Planck Institute for the Study of Crime, Security and Law, Freiburg, Germany

⁵Padova Neuroscience Center, University of Padova, Padova, Italy

⁶Human Inspired Technology Center, University of Padova, Padova, Italy

⁷Cognitive Neuroimaging Unit, NeuroSpin, CEA, INSERM, CNRS, Université Paris-Saclay, Gif/Yvette, France

**Corresponding author*

Giovanna Mioni

Department of General Psychology

University of Padova

Via Venezia, 8

35131, Padova, Italy

giovanna.mioni@unipd.it - mioni.giovanna@gmail.com

ABSTRACT

The COVID-19 outbreak and governmental measures to keep the population safe had a great impact on many aspects of society, including well-being. Using data from N=1281 participants from six countries (Argentina, France, Greece, Italy, Japan, and Turkey), we first explored differences in anxiety, depression (measured with Hospital Anxiety and Depression Scale; HADS) and time perspectives (Zimbardo Time Perspective Inventory; ZTPI), between these countries during the first weeks of the pandemic. We observed that Turkish participants reported the highest levels of anxiety, and Japanese and Greek the lowest. For depression symptoms, the Japanese scored highest and Italians lowest. Next, for each country, we investigated how well the relatively time-stable personality traits of time perspectives, chronotype (reduced Morningness-Eveningness Questionnaire; rMEQ), and Big Five personality traits (short Big Five Inventory; BFI) predicted the levels of anxiety and depression (HADS). The regression analyses showed that negative attitudes towards the past predicted the levels of both anxiety and depression in most of the countries we analyzed. Additionally, in many countries, a Past Positive orientation negatively predicted depression whereas the Present Fatalistic subscale predicted anxiety and depression. The chronotype did not contribute additionally to the models. The Big Five traits (and particularly neuroticism) showed substantial incremental explanatory power for anxiety in some countries but did not consistently predict anxiety levels. For depression, the additional variance accounted for by including the BFI as predictors was rather small. Importantly, the ZTPI subscales were retained as significant predictors in the model still when the BFI and rMEQ were considered as potential predictors. Our results yield evidence that the ZTPI time perspectives are valuable predictors for anxiety and depression levels during the first period of the pandemic.

Keywords: covid-19, personality traits, anxiety, depression, psychopathology, regression, cross-country comparison

INTRODUCTION

Psychological consequences of the pandemic situation

Facing the Covid-19 pandemic, governments around the world felt compelled to restrict citizens' mobility to protect the population. Besides its effectiveness for the containment of the virus, social distancing has consequences for both short- and long-term well-being (Galea, Merchandt, & Lurie, 2020). The pandemic situation can affect various psychological outcomes: people reported to experience more fear of getting sick, being hopeless, or stereotyped by others (Salari et al., 2020). A review by Brooks and colleagues (2020) concluded that being quarantined was associated with negative emotions such as anxiety and depression. In a systematic review, Salari and colleagues (2020) analyzed 17 studies from nine countries conducted during the COVID-19 outbreak and showed that the pandemic affected mental health and raised the levels of depression, anxiety, and stress. This increase can be explained by multiple factors: for instance, the World Health Organization (see Grondin et al., 2020) asserted that the more people were exposed to (potentially distressful) news on COVID-19, the higher the reported levels of anxiety and depression were, unless the information were accurate and up-to-date (Wang et al., 2020). Highest levels of anxiety and depression were found in women, young adults, individuals with higher levels of education, and Asians as compared to Europeans (Salari et al., 2020).

The pandemic and the associated routines also affected the perception of time: agendas and routines changed because of the loss of zeitgebers and temporal landmarks, up to a level where the days lost their identity and significance (Grondin et al., 2020). In the UK, Ogden (2020) observed that approximately 40% of the participants indicated that time passed more slowly, and 40% felt it passed more quickly than before the lockdown. Individuals who were more satisfied with their social situation and engaged in more activities perceived the passage of time as more quickly compared to before the lockdown. Similarly, in France, boredom and sadness predicted a perceived slowing down of the passage of time (Droit-Volet et al., 2020). Besides forgetting what day it was, the lockdown led to paradoxical impressions that time flew slowly, but in hindsight intervals were perceived as

77 short, or the other way around (Wittmann, 2020). For some, monotony during the quarantine induced
78 boredom, leading to a perceived deceleration of the passage of time. However, with few significant
79 memories, intervals appear to be shorter in hindsight (Avni-Babad & Ritov, 2003). For others,
80 attention might be attracted by less monotony in the daily structure, by the challenge of organizing
81 (more) activities (e.g., due to additional childcare duties), and by the occurring events during the first
82 phase of the quarantine. With less attention directed to time, time is perceived as passing more quickly
83 (Grondin et al., 2020). However, when intervals are then judged retrospectively, they are estimated
84 longer when they are filled with less routine activities and when more unique memories can be
85 retrieved (Avni-Babad & Ritov, 2003).

86 Next to this altered perception of how fast time flies, the pandemic situation created
87 uncertainty about how long the lockdown might persist and uncertainty about one's future prospects.
88 Nobody could predict the duration of the governmental measures, how the pandemic would further
89 affect the health care systems, and what consequences it might have on the global, national, and
90 individual levels concerning the economy and the society, and on one's own health status. How long
91 will I be in this situation and what are my prospects for the future? Confronted with this (temporal)
92 uncertainty, individual differences in time perspectives may therefore be an important factor
93 accounting for how individuals manage to adapt to the adverse pandemic situation.

94 **Brief Introduction to Time Perspectives**

95 Time perspective is a personality trait that is relatively stable over time, shaped through
96 learning experiences and cultural influences (Kairys & Liniauskaite, 2015; Zimbardo & Boyd, 1999).
97 The individual characteristics of time perspectives determine how information is considered and
98 evaluated, and affect individual preferences, decision-making, and behavior (e.g., risk-taking,
99 Jochemczyk et al., 2017; aggression, Stolarski et al., 2016). The concept of time perspectives was
100 initially introduced with Zimbardo and Boyd's (1999) Time Perspective Theory. Accordingly,
101 individual time perspective can be defined as "*the often nonconscious process whereby the continual*
102 *flows of personal and social experiences are assigned to temporal categories, or time frames, that*

103 *help to give order, coherence, and meaning to those events”* (Zimbardo & Boyd, 1999, p. 1271). The
 104 individual time perspective profile can be measured with the Zimbardo Time Perspective Inventory
 105 (ZTPI; Zimbardo & Boyd, 1999) which is composed of 56 items divided into five subscales: Past
 106 Negative (PN), Past Positive (PP), Present Fatalistic (PF), Present Hedonistic (PH) and Future (F).
 107 As claimed by Zimbardo and Boyd (1999, 2008), each of these temporal frames reflects specific
 108 attitudes in individuals. Past Positive refers to a positive and nostalgic image of the past; the Past
 109 Negative factor represents a regretful view on past experiences. High levels on the Present Fatalistic
 110 factor are common for individuals who are characterized by a hopeless deterministic attitude towards
 111 the present limited in controllability whereas Present Hedonistic describes individuals who are more
 112 oriented to the enjoyment of the current moment - they are sensation seekers and worry little about
 113 future consequences of their behaviors. Highly future-oriented individuals are characterized by goal-
 114 oriented behaviors and high consideration of the consequences of their decisions at the expense of
 115 immediate gratifications (Zimbardo & Boyd; 1999; 2008; Sircova et al., 2014; Sircova et al., 2015).
 116 These five factors can be influenced by culture: Sircova and colleagues (2015) reported that the
 117 distribution of the time profiles varies across countries. For instance, in France, there was a strong
 118 hedonistic orientation towards the present whereas in Turkey authors observed combinations of
 119 future-oriented and past negative and present fatalistic types.

120 **Personality Traits as Predictors for Anxiety and Depression**

121 The five time perspective factors are associated with indicators of well-being. In a sample of
 122 Belgian older adults, higher levels of Future and Present Hedonistic factors were associated with
 123 positive affect (Desmyter & De Raedt, 2012). Participants who were more positively oriented towards
 124 the past reported a higher level of life satisfaction. In contrast, the Present Fatalistic and Past Negative
 125 factors were associated with symptoms of depression (Desmyter & De Raedt, 2012). These results
 126 were in line with the initial validation study of the Zimbardo Time Perspective Inventory sampling
 127 among students (Zimbardo & Boyd, 1999) and in which the authors found that high scores on the
 128 Past Negative and Present Fatalistic factors were moderately associated with both anxiety and

129 depression whereas a Present Hedonistic perspective was weakly but positively correlated with
130 depression. Additionally, Future and Past Positive orientations were found to be weakly negatively
131 correlated with both depression and anxiety. The negative association of Future and anxiety was also
132 supported by a preliminary study conducted in Greece by Papastematelou and colleagues (2015) on
133 a sample of male subjects.

134 It has been found that the chronotype, the individual difference in circadian preference, also
135 predicts the levels of anxiety and depression (e.g., Anytpa et al., 2016; Cox & Olatunij, 2019)
136 Specifically, evening orientation is associated with depression (Kivelä et al., 2018; Merikanto et al.,
137 2015), whereas results are inconclusive for anxiety. A review analyzing the relationship between
138 chronotype and mental health found that in adults, eveningness was related to higher levels of anxiety
139 (Kivelä et al., 2018). This relationship, however, is not consistently found in adolescent samples
140 (Kivelä et al., 2018).

141 The levels of anxiety and depression can also be predicted by the established Big Five
142 personality dimensions (agreeableness, conscientiousness, extraversion, neuroticism, and openness).
143 The Big Five traits are related to anxiety and depression : In a meta-analysis of 2010, Kotov and
144 colleagues concluded that neuroticism was positively associated with anxiety and depression whereas
145 extraversion and conscientiousness showed a negative correlation with these pathologies.

146 **The Present Study**

147 The present study is part of a wider project which involved several laboratories working on
148 time perception and temporal processing from 15 countries. The project aimed at investigating the
149 individuals' experience of time during the exceptional circumstances of the COVID-19 pandemic
150 longitudinally and cross-culturally and was composed of multiple sessions (for the registry on the
151 Open Science Framework (OSF), see: van Wassenhove, V., Balci, F., Giersch, A., Gronfier, C., &
152 Vatakis, A., 2020). We used data from the first session which was conducted during the first wave of
153 the pandemic in spring 2020.

The purpose of the study at hand was, first, to assess time perspectives, levels of depression, and anxiety interculturally during the first weeks of the pandemic and to detect differences between countries. Second, we wanted to investigate whether and to what extent the relatively stable personality traits of Time Perspectives, Big Five Traits, and chronotype could predict the levels of anxiety and depression. Third, we wanted to extract the set of personality traits that best predicted anxiety and depression. We present parsimonious models that best predicted anxiety and depression levels during the pandemic for each country.

By doing so, we are able to present valuable information about the differences between countries in levels of anxiety and depression during the pandemic. Additionally, we can show how well, and which, personality traits can predict these pathologies - giving clues to which risk factors of personality particular attention needs to be paid. Since our data were collected during the first wave of the COVID-19 pandemic, this allows comparing to what extent our results are consistent with the ones reported from research before the 2020 pandemic.

METHODS

Project

An international online observation study was conducted by members of the Timing Research Forum (TRF) on the GORILLA™ platform. It was designed for examining various aspects of time perception and timing during the first months of the pandemic and the associated governmental measures. Each of fifteen countries translated the questionnaires and tasks to their native languages and was responsible for the data collection in their country. All participants signed an Informed Consent and – except for Japan – there was no monetary compensation for participating in the study. The Principal Investigator of the multicenter study – Dr. Virginie van Wassenhove – received the approval for the international study from the Ethical Committee of the University of Paris-Saclay (CER-Paris-Saclay-1010-020). The study protocol was also approved by local Ethical Committees in

each country and was developed in accordance with the Declaration of Helsinki (2018). For the present study, we employed data from six countries which provided at least 100 participants who completed all questionnaires: Argentina (AR), France (FR), Greece (GR), Italy (IT), Japan (JP), and Turkey (TR).

183

Table 1. *Demographic information on the sample, subdivided by country.*

Country	N	Sex		M	Age		Data Collection	
		Female	Male		SD	Range	Start	End
Argentina	206	142	64	33.9	10.2	18-60	12/05	08/06
France	474	340	134	40.9	11.8	19-60	10/04	10/05
Greece	173	130	43	30.9	10.2	18-56	18/04	07/05
Italy	170	108	62	26.7	9.93	18-60	20/04	19/05
Japan	87	47	40	40.3	11.4	21-60	01/05	24/05
Turkey	171	132	39	22.8	4.10	18-55	21/04	07/06
ALL	1,281	899	382	34.1	12.3	18-60	10/04	08/06

185

Participants

Participants were invited to participate on the website of the Timing Research Forum and via social media pages. Individuals who were declared to have a diagnosed neurological or a psychological disorder were automatically excluded out of the data collection. To have more comparable samples between countries, we restricted the sample to participants aged between 18 to 60 years. As can be seen in Table 1, this resulted in a total of $N = 1,281$ individuals for the analyses, comprising 899 females and 382 males whose age ranged from 18 to 60 years ($M = 34.1$; $SD = 12.3$). However, the distributions of age, sex, and the number of participants were unequal across countries (see Table 1). The six countries included in our sample experienced different levels of restrictions during the period in which data were collected as can be seen in Table 2.

196

197

198 Table 2. *Mobility changes and Stringency Indices during the assessment period by countries and*
 199 *areas.*

coun try	period start/end	Retail & Recreation M (SD)	Grocery & Pharmacy M (SD)	Residential M (SD)	Transit Stations M (SD)	Parks M (SD)	Work Places M (SD)	Stringency M (SD) [0-100]
AR	12/05	-70.49%	-24.09%	19.32%	-54.83%	-87.45%	-31.22%	90.32
	08/06	(2.48)	(2.80)	(0.92)	(1.70)	(1.35)	(3.76)	(0.79)
FR	10/04	-80.45%	-39.76%	27.52%	-77.58%	-62.71%	-62.53%	87.96
	10/05	(3.10)	(3.55)	(1.40)	(2.61)	(3.03)	(3.64)	(0.00)
GR	18/04	-69.99%	-10.16%	20.28%	-62.84%	-15.89%	-52.14%	82.32
	07/05	(-5.93)	(10.24)	(2.57)	(6.17)	(17.69)	(6.71)	(4.39)
IT	20/04	-72.02%	-41.19%	23.39%	-67.92%	-56.61%	-51.82%	77.53
	19/05	(9.81)	(8.87)	(4.76)	(9.42)	(20.05)	(9.78)	(15.24)
JP	01/05	-32.95%	-3.10%	15.69%	-50.17%	-5.48%	-31.71%	44.25
	24/05	(1.81)	(0.82)	(3.47)	(5.58)	(5.83)	(10.98)	(3.30)
TR	21/04	-60.72%	-20.34%	19.71%	-60.20%	-34.53%	-48.26%	74.17
	07/06	(10.10)	(12.10)	(4.69)	(10.71)	(17.10)	(10.93)	(4.29)

200 Note. Changes in mobility are indicated as the percentage of decrease or increase, compared to the
 201 baseline, which is the median value from a 5-week period, Jan 3 – Feb 6, 2020, when none of these
 202 countries (AR=Argentina; FR=France; GR=Greece; IT=Italy; JP=Japan and TR=Turkey) was
 203 affected by the pandemic. Percentages were averaged over the days of assessment. The Stringency
 204 Index reflects governmental measures in response to the pandemic and is a composite measure based
 205 on nine response indicators including school closures, workplace closures, and travel bans, rescaled
 206 to a value from 0 to 100 (100 = strictest). If policies vary at the subnational level, the index is shown
 207 as the response level of the strictest sub-region. *Data derived from OurWorldinData:*
 208 *<https://ourworldindata.org/grapher/changes-visitors-covid?for the mobility indices>*
 209 *(<https://www.google.com/covid19/mobility/>)* *[https://ourworldindata.org/grapher/covid-](https://ourworldindata.org/grapher/covid-stringency-index)*
 210 *[stringency-index](https://ourworldindata.org/grapher/covid-stringency-index) [for the stringency index (Hale et al., 2021)].*
 211

212 Measures

213 Participants provided demographic data on age and sex. Additionally, we used the following
 214 four questionnaires.

215 *Hospital Anxiety and Depression Scale (HADS)*

216 The Hospital Anxiety and Depression Scale (HADS, Zigmond & Snaith, 1983) consists of 14
 217 items rated on Likert scales ranging from 0 to 3. The questionnaire can be divided into two seven-
 218 item subscales (with sum scores ranging from 0 to 21), one measuring the level of anxiety and one
 219 gauging depression symptoms. A score higher than 11 indicates elevated levels of anxiety and

depression (Zigmond & Snaith, 1983), which was also recommended as a cut-off in a later normative data study with a non-clinical sample (Crawford et al., 2001). Anxiety and Depression scales are moderately correlated ($r = .53$); reliabilities as measured with Cronbach's α are good with $\alpha = .82$ (Anxiety) and $\alpha = .77$ (Depression; Crawford et al., 2001).

Zimbardo Time Perspective Inventory (ZTPI)

The Zimbardo Time Perspective Inventory (ZTPI, Zimbardo & Boyd, 1999) is composed of 56 items. Participants evaluate on a Likert scale ranging from 1 = very untrue to 5 = very true to what extent each statement applies to them. The questionnaire contains five subscales derived from factor analytic studies: Past Negative (PN), Past Positive (PP), Present Fatalistic (PF), Present Hedonistic (PH), and Future (F). Four-week test-retest reliabilities range from .70 to .80, indicating high stability (Zimbardo & Boyd, 1999). We used the mean of the respective items for the subscale scores.

Reduced Morningness-Eveningness Questionnaire (rMEQ)

We measured the individual chronotype with the reduced version of the Morningness-Eveningness Questionnaire (rMEQ, Adan & Almirall, 1991). This scale involves 5 items allowing to classify participants sensitively and reliably into Morning-, Evening- or Intermediate-type. The reduced scale can be seen as an amelioration of the original MEQ and its internal consistency was evaluated as high (Adan & Almirall, 1991). Total scores can range from 4 to 25, where lower scores (4 to 10) refer to Evening-type, high scores (19 to 25) are classified as Morning-type, and the remainder allocates to the Intermediate-type.

Big Five Inventory (BFI-10)

The short version of the Big Five Inventory (BFI-10, Rammsted & John, 2007) consists of ten items - two for each of the five subscales measuring the Big Five personality dimensions: agreeableness, conscientiousness, extraversion, neuroticism, and openness. The statements are all rated on the same Likert scale ranging from 1 = strongly disagree to 5 = agree strongly. Cronbach's α are appropriate with mean $\alpha = .75$. The scores remain respectably stable, as indicated by an eight-

245 week test-retest reliability is .72 (Rammsted & John, 2007). We calculated the mean on the two items
246 for the subscales, respectively.

247

248 **Statistical Analyses**

249 First, we analyzed differences in anxiety and depression concerning age, sex, and country. For
250 this purpose, we ran general linear model analyses with anxiety and depression as dependent variable,
251 respectively, with age as covariate, and sex and country as factors. Further, we computed post-hoc
252 analyses, with Bonferroni correction, in order to assess differences between countries. Next, for each
253 of the five ZTPI subscales as the dependent variable, we conducted general linear model analyses
254 including age as covariate, and sex and country as factors. In this case, again, we computed post-hoc
255 analyses with Bonferroni correction to test for differences between countries.

256 In order to extract the explanatory variables out of the set of proposed predictors that best
257 predicted levels of anxiety and depression, respectively, we ran stepwise regression analyses (also
258 referred to as fast stepwise procedure, FSP, An & Gu, 1989; Yamashita, Yamashita & Kamimura,
259 2007). In contrast to hierarchical regression, the stepwise method uses an automatic procedure for the
260 choice of predictive variables: Beginning from a null model (without predictors), in each step, the
261 procedure both checks whether to add another predictive variable and whether to remove a previously
262 added variable from the model that is not any more adding incremental validity to the prediction
263 (unique predictive power; Thompson, 1989). The feature of removing variables that are no longer of
264 additional value makes this method superior to hierarchical regression modeling which is susceptible
265 to the problem of multicollinearity. The model resulting from stepwise regression is similar to a best-
266 subset regression where the combination of variables with the most explanatory power is selected out
267 of all possible combinations (Ruengvirayudh & Brooks, 2016), but is computationally less
268 demanding. R^2 values have been criticized to be usually overestimated with this method, therefore
269 we will report a conservative adjusted R^2 as an indicator of explained variance in the response variable

270 (level of anxiety, level of depression). This conservative R^2 is adjusted for the number of candidate
271 predictors (rather than the number of selected predictors in the final model as usually done for
272 adjustment) and provides a nearly unbiased estimate of R^2 (Harrell, 2001):

273 conservative $\text{adj. } R^2 = 1 - (1 - R^2) \frac{n - 1}{n - k - 1}$ with $n = \text{sample size}$
274 $k = \text{number of candidate predictors}$

275 For model selection, we resorted to the minimization of the Akaike Information Criterion
276 (AIC; Akaike, 1974). The AIC is a function of the prediction error of the model on the given data and
277 includes a penalty term for the total number of predictors. A lower AIC corresponds to better
278 goodness of fit under consideration of model parsimony. The AIC is thus an estimator of model
279 quality. Once adding or removing further predictors does not reduce AIC, the algorithm stops.

280 In a first analysis, we entered the five time perspective subscales as well as age and sex into the
281 saturated set of variables to be considered. In a subsequent analysis, we additionally included the Big-
282 5 personality trait scales and the rMEQ. When predictor variables are highly correlated, only the
283 variable with more explanatory power next to the other variables included will be extracted for the
284 final model. This is desired in our study since we aim to explore the value of time perspectives as
285 explanatory variables compared to the Big-5 personality traits.

286 Before computing the stepwise regression models, we computed the variance inflation factors
287 (VIF) for all variables in all countries. The VIF is a quantification of multicollinearity in multiple
288 regression models (Hair et al., 2019). The square root of the VIF measures how much the variance of
289 a regression coefficient might be increased due to multicollinearity (Fox, 2005). With a conservative
290 $\text{VIF} < 3$, multicollinearity is not a problem in the model (Hair et al., 2019). VIF is computed as follows
291 (with R^2 representing the adjusted R^2 when all other predictor variables included in the multiple
292 regression model predict the remaining predictor variable):

293

294

$$\text{VIF} = \frac{1}{1 - R^2}$$

12

295 All analyses were computed under a two-tailed significance level of $\alpha = .05$ using the freeware
296 statistics program R (<https://www.r-project.org>) and the GAMLj module for jamovi (Gallucci, 2019).

297

298 **RESULTS**

299 Descriptive statistics for the variables used in the present study are provided in Table 3.

300

301 Table 3. *Descriptive statistics of the study variables for the whole sample and separately for each country.*

	Argentina	France	Greece	Italy	Japan	Turkey	TOTAL
Sample Size (<i>n</i>)	206	474	173	170	87	171	1,294
Sex: F (% of <i>n</i>)	142 (70.40%)	340 (71.73%)	130 (75.14%)	108 (63.53%)	47 (54.02%)	132 (77.19%)	911 (70.40%)
Age M (SD)	33.95 (10.22)	40.87 (11.79)	30.87 (10.15)	26.66 (9.90)	40.34 (11.38)	22.77 (4.09)	34.19 (12.70)
HADS-Anxiety M (SD)	7.84 (4.24)	7.50 (4.04)	6.62 (4.08)	7.79 (4.33)	5.71 (3.33)	9.29 (4.41)	7.58 (4.21)
HADS-Depression M (SD)	6.52 (3.90)	5.53 (3.93)	6.24 (3.88)	4.96 (3.28)	9.12 (3.65)	7.92 (3.65)	6.27 (3.95)
ZTPI-Past Negative M (SD)	2.79 (0.76)	2.71 (0.82)	2.86 (0.79)	3.01 (0.77)	3.00 (0.78)	3.12 (0.72)	2.86 (0.80)
ZTPI-Past Positive M (SD)	3.54 (0.57)	3.31 (0.66)	3.44 (0.65)	3.45 (0.57)	3.33 (0.67)	3.60 (0.66)	3.42 (0.65)
ZTPI-Present Fatalistic M (SD)	2.38 (0.55)	2.45 (0.62)	2.42 (0.56)	2.45 (0.50)	2.75 (0.55)	2.56 (0.57)	2.47 (0.58)
ZTPI-Present Hedonistic M (SD)	3.05 (0.53)	3.36 (0.58)	3.39 (0.51)	3.32 (0.43)	3.07 (0.52)	3.37 (0.52)	3.29 (0.55)
ZTPI-Future M (SD)	3.47 (0.55)	3.49 (0.53)	3.62 (0.57)	3.66 (0.52)	3.58 (0.54)	3.55 (0.55)	3.54 (0.55)
BFI-Agreeableness M (SD)	3.33 (0.86)	2.45 (0.66)	3.37 (0.59)	3.16 (0.89)	2.83 (0.69)	3.26 (0.66)	3.04 (0.88)
BFI-Conscientiousness M (SD)	3.91 (0.91)	3.46 (0.66)	3.13 (0.63)	3.63 (0.87)	3.41 (0.66)	3.16 (0.61)	3.48 (0.77)
BFI-Extraversion M (SD)	2.81 (1.11)	3.27 (0.60)	3.33 (0.61)	3.22 (0.94)	2.98 (0.39)	3.14 (0.47)	3.16 (0.76)
BFI-Neuroticism M (SD)	3.23 (1.16)	3.23 (0.57)	3.29 (0.44)	3.10 (1.06)	3.24 (0.65)	3.16 (0.61)	3.21 (0.77)
BFI-Openness M (SD)	3.51 (0.84)	3.06 (0.79)	3.70 (0.87)	3.63 (0.98)	2.98 (0.62)	3.12 (0.66)	3.30 (0.86)
rMEQ M (SD)	13.91 (4.50)	15.81 (3.92)	13.08 (3.66)	14.39 (3.55)	14.93 (3.87)	11.82 (4.09)	14.35 (4.20)

302

303 **Effects of Country, Age, and Sex on Anxiety**

304 In order to test differences concerning anxiety levels between countries and sex we ran a
305 general linear model (GLM) analysis, including age as covariate. A significant effect of age on
306 anxiety was observed, $F(1, 1,261) = 15.38, p < .001$. Generally, younger participants reported higher
307 levels of anxiety. There was also a significant effect of sex on anxiety levels, $F(1, 1,261) = 27.55, p$
308 $< .001$. Females reported higher levels of anxiety when compared with males, $t(1,261) = 5.25,$
309 $p_{Bonferroni} < .001$. The effect of country on anxiety was also significant, $F(5, 1,261) = 6.87, p < .001$.
310 Specifically, there were significant pairwise differences between Argentina and Greece $t(1,261) =$
311 $3.09, p_{Bonferroni} = .030$; Greece and Turkey $t(1,261) = -4.41, p_{Bonferroni} < .001$; France and Greece
312 $t(1,261) = 3.83, p_{Bonferroni} < .002$; France and Japan $t(1,261) = 3.63, p_{Bonferroni} = .004$; and Japan and
313 Turkey $t(1,261) = -3.99, p_{Bonferroni} = .001$ (see Figure 1).

314
315 *Figure 1: Average anxiety levels in the six studied countries. Whiskers represent the SE of the mean.*

317 **Effects of Country, Age, and Sex on Depression**

318 Next, with the same model but now with depression as the dependent variable, we again tested
319 for differences between countries and sex with a GLM analysis, including age as covariate. We
320 observed a significant effect of age on depression, $F(1, 1,261) = 30.93, p < .001$, with younger

321 participants reporting higher levels of depression compared to older individuals. There was also a
 322 significant effect of sex on depression, $F(1, 1,261) = 5.24, p = .022$. Again, females reported higher
 323 levels of depression than males, $t(1,261) = 2.29, p_{Bonferroni} = .02$. We also observed a statistically
 324 significant difference in levels of depression between countries, $F(1, 1,261) = 21.96, p < .001$. Italy
 325 reported significantly lower, and Japan exhibited significantly higher levels of depression compared
 326 to all other countries (see Figure 2). There were no significant differences between Argentina, France,
 327 Greece, and Turkey.

328
 329 *Figure 2: Average depression levels in the six studied countries. Whiskers represent the SE of the*
 330 *mean.*

332 **Differences in Time Perspectives**

333 For each of the Zimbardo Time Perspective Inventory subscales as a dependent variable, we
 334 computed a general linear model analysis, with age as covariate, and sex and country as factors. A
 335 graphical overview of the average levels on each subscale by country is presented in Figure 3. For
 336 the Past Negative (PN) subscale, we observed a significant effect of age, $F(1, 1,268) = 29.646, p <$
 337 $.001$. Younger participants reported higher scores on the PN subscale, $t(1,268) = -5.44, p < .001$.
 338 Although we found a significant effect of country, $F(1, 1,268) = 3.20, p = .007$, none of these

339 differences was found to be statistically significant in the post-hoc analyses. The effect of sex on the
340 PN subscale was non-significant, $t(1,268) = -1.09$, $p = .275$.

341 On the Past Positive (PP) subscale, the model indicated a significant effect only for country,
342 $F(5,1,268) = 4.59$, $p < .001$. The post-hoc analyses showed that there were statistically significant
343 differences between French and Turkish participants, $t(1,268) = -3.79$, $p_{Bonferroni} = .002$, and between
344 Argentinian and French participants, $t(1,268) = 3.71$, $p_{Bonferroni} = .003$. French participants scored
345 lowest on the PP subscale on average. The effects of sex on PP ($F(1, 1,268) = 3.05$, $p = .081$) and of
346 age on PP ($F(1, 1,268) = 0.176$, $p = .674$) were non-significant.

347 Concerning the Present Fatalistic (PF) subscale, we observed a significant effect of country,
348 $F(5, 1,268) = 5.39$, $p < .001$. Japanese participants reported the higher levels of PF. The post-hoc
349 analyses revealed significant differences between Argentinian and Japanese participants, $t(1,268) = -$
350 4.59 , $p_{Bonferroni} < .001$, Greek and Japanese participants, $t(1,268) = -4.22$, $p_{Bonferroni} < .001$, French and
351 Japanese participants, $t(1,268) = -4.51$, $p_{Bonferroni} < .001$, and Italian and Japanese participants $t(1,268)$
352 $= -3.49$, $p_{Bonferroni} = .007$. The effects of sex on PF ($F(1, 1,268) = 2.91$, $p = .088$) and of age on PF
353 ($F(1, 1,268) = 0.55$, $p = .455$) were non-significant.

354 For the Present Hedonistic (PH) subscale, we observed a significant effect of country, $F(5,$
355 $1,268) = 12.20$, $p < .001$. Argentinian and Japanese participants reported the lowest scores of PH on
356 average. In the post-hoc analyses, we found significant differences between Argentinian and Greek
357 participants, $t(1,268) = -5.10$, $p_{Bonferroni} < .001$, Argentinian and French participants, $t(1,268) = -6.31$,
358 $p_{Bonferroni} < .001$, Argentinian and Italian participants, $t(1,268) = -4.66$, $p_{Bonferroni} < .001$; Argentinian
359 and Turkish participants, $t(1,268) = -4.67$, $p_{Bonferroni} < .001$, as well as between Greek and Japanese
360 participants, $t(1,268) = 3.78$, $p_{Bonferroni} = .002$, French and Japanese participants, $t(1,268) = 4.45$,
361 $p_{Bonferroni} < .001$, Japanese and Turkish participants, $t(1,268) = -3.44$, $p_{Bonferroni} = .009$, and Italian and
362 Japanese participants, $t(1,268) = 3.32$, $p_{Bonferroni} = .014$. Again, effects of sex on PH ($F(1, 1,268) =$
363 0.31 , $p = .575$) and of age on PH ($F(1, 1,268) = 0.97$, $p = .324$) were non-significant.

364 Finally, for the Future subscale we observed a significant effect of age, $F(5, 1,268) = 5.14, p$
 365 $= .024$. Younger participants reported lower scores on this subscale on average when compared to
 366 older individuals. A significant effect of sex was also found, $F(5, 1,268) = 5.77, p = .016$. Females
 367 reported higher levels on the Future Subscale compared to males, $t(1,268) = 2.40, p_{Bonferroni} = .016$.
 368 The effect of country was also significant, $F(5, 1,268) = 5.00, p < .001$. Italian participants reported
 369 higher scores in the future subscale compared to French and Argentinian participants: The post-hoc
 370 analysis showed significant differences between Argentinians and Italians, $t(1,268) = -3.91, p_{Bonferroni}$
 371 $= .001$, as well as French and Italian participants, $t(1,268) = -4.43, p_{Bonferroni} < .001$.

372
 373 *Figure 3: Average scores on the Zimbardo Time Perspectives Inventory subscales for each country.*

374

375 Stepwise Regression models

376 With stepwise regression models, we aimed to find the model that best and most
 377 parsimoniously predicted the levels of anxiety in each of the six countries included in our sample.
 378 First, we checked for multicollinearity in the multiple regression models using the VIF. The largest
 379 VIF was 1.68 (observed for Past Negative in Argentina). Following the interpretation rules, this value

380 indicates no matter for concern and the subsequent regression analyses can be conducted (Hair et al.,
381 2019).

382 **Stepwise Regression of Anxiety on Personality Traits**

383 The detailed results of the stepwise regression models for the prediction of anxiety are shown
384 in Table 4. First, we considered the five subscales of the ZTPI next to age and sex as potential
385 predictors (ZTPI model). A negative attitude towards the past and present affected the levels of
386 anxiety significantly in many countries. We found that the Past Negative subscale was a significant
387 positive predictor in all countries. The scores on the Present Fatalistic subscale also significantly and
388 positively predicted anxiety levels in all countries except for Argentina and Japan. For a positive
389 attitude towards the past and present, the results were less consistent. In particular, we observed a
390 significant positive effect of Present Hedonistic only in the Japanese sample whereas Past Positive
391 had a significant negative effect in the Turkish sample only. The future subscale predicted anxiety
392 levels positively in Italy and Turkey and was marginally significant ($p < .10$) in Argentina and France.
393 Sex was negatively related to anxiety levels, indicating that male experiences higher level of anxiety
394 than female in all counties except for France and Japan Age negatively predicted anxiety levels in
395 Italy only. The final models with age, sex, and the ZTPI subscales as potential predictors accounted
396 for 12% (Japan) to 30% (Turkey) of the variance in anxiety levels (mean explained variance across
397 countries = 23.43%, SD = 6.53%), as indicated by the conservatively adjusted R^2 of the respective
398 models.

399 Next, we also considered the BFI and the rMEQ as additional potential predictors next to the
400 ZTPI, age, and sex (extended model). Neuroticism was retained in the final models in all countries
401 except Greece. However, whereas neuroticism predicted anxiety levels positively in Argentina, Italy,
402 and Turkey, it was a negative predictor in Japan and marginally significantly also in France ($p > .10$).
403 In Japan, extraversion positively predicted anxiety levels. Openness predicted anxiety positively in
404 Italy, and negatively in Turkey. Italy was furthermore the only country in which the chronotype as
405 measured with the rMEQ (negatively) predicted anxiety levels. That is, individuals with pronounced

eveningness are more likely to report higher anxiety levels in this first phase of the pandemic. With the added predictors, the ZTPI subscales retained in the first (ZTPI) model were also retained in the extended model. Only in Japan, the PN subscale was rendered marginally significant ($p < .10$), but still remained in the final model. Sex was no longer retained as a predictor in Turkey, age was no longer retained in Italy, and in Argentina, sex remained in the model but was no longer significant ($p < .10$). With the additional predictors (BFI, rMEQ), the percentage of explained variance in anxiety levels was raised considerably in Argentina (from 21% to 34%) and in Italy (from 26% to 40%), and less strongly in Japan (from 12% to 19%) and in Turkey (from 30% to 32%), as indicated by the conservatively adjusted R^2 of the respective final models. In France, the R^2 stayed the same (.23), in Greece the value decreased slightly (due to the penalty for the included potential predictors) from .29 to .26. The mean explained variance across countries was 28.83% ($SD = 7.74\%$) for the extended model (conservatively adjusted R^2).

Stepwise Regression of Depression on Personality Traits

For the depression models, the detailed statistics of the final models after the stepwise regression are presented in Table 5. The results for the ZTPI model (including ZTPI, age, and sex as potential predictors) indicated that the Past Negative subscale consistently positively predicted depression levels in all countries except for Japan where PN was not retained in the model. Past Positive was retained as a negative predictor in the model in all countries except for Italy but was only marginally significant in Argentina ($p < .10$). The Present Fatalistic subscale positively predicted depression in France and Italy, and was marginally significant in Greece and Turkey ($p < .10$). Positive attitudes to the present (Present Hedonistic subscale) negatively predicted depression levels in France, and marginally significant also in Italy ($p < .10$). The Future subscale acted as a significant negative predictor in Japan only. Age was negatively associated with reported depression symptoms in France, Italy, and Turkey, and marginally significant also in Argentina. Sex predicted depression scores on the HADS in Argentina and Italy, where being female was an indicator for higher levels of depression. The final ZTPI models with age, sex, and the ZTPI subscales as potential predictors

432 accounted for 14% (Japan) to approximately 20% (Greece, Italy, and Turkey) of the variance in
433 depression levels (mean explained variance across countries = 17.90%, SD = 2.45%), as indicated by
434 the conservatively adjusted R^2 of the respective models.

435 Next, for the extended model, we additionally included the BFI and the rMEQ as additional
436 potential predictors next to the ZTPI, age, and sex. There was no consistent pattern of these predictors.
437 Agreeableness negatively predicted depression in Turkey only, whereas extraversion was a positive
438 predictor in Italy (and marginally significantly in Greece). Neuroticism positively predicted
439 depression levels in Argentina, and marginally significantly in Italy. Openness was a negative
440 predictor in Greece, with marginal significance in Argentina, ($p < .10$). The rMEQ was retained in
441 the final models as a negative predictor for depression in the Greek and Turkish sample, but both
442 times was not a significant predictor itself. All ZTPI subscales remained in the model when the
443 additional predictors were included; Past Positive in Argentina and Present Fatalistic in Greece
444 became significant predictors (after having been only marginally significant in the model with ZTPI,
445 sex, and age as predictors). Age was no longer retained as a negative predictor in Argentina only and
446 became only marginally significant in Turkey. For sex, there were no differences compared to the
447 first (ZTPI) model. With the added predictors (BFI, rMEQ), the percentage of variance in depression
448 levels accounted for by the final models increased in Argentina (from 17% to 23%) and in Greece
449 (from 20% to 23%). There were also slight increases in the conservatively adjusted R^2 in Italy (from
450 .19 to .21), and in Turkey (from .20 to .21). The R^2 decreased slightly in France (from .18 to .17), and
451 strongly in Japan (from .14 to .07) because of the penalty for the included potential predictors. The
452 mean explained variance of scores on the HADS depression subscale across countries was 18.35%
453 (SD = .45%) for this extended model.

454 **Table 4.** Final models for anxiety after stepwise regression (country-wise, with two models each (1st: ZTPI, sex, and age as predictors; 2nd -
455 extended: ZTPI, sex, age, BFI, and rMEQ as predictors)).

Country	Argentina (n = 206)		France (n = 449)		Greece (n = 169)		Italy (n=170)		Japan (n = 87)		Turkey (n = 171)	
Scales	ZTPI	extended	ZTPI	extended	ZTPI	extended	ZTPI	extended	ZTPI	extended	ZTPI	extended
age							-0.08** (0.03)				-0.11 ^([○]) (0.07)	
Sex (M)	-1.55** (0.57)	-0.87† (0.52)			-1.43* (0.64)	-1.43* (0.64)	-2.23*** (0.59)	-1.77** (0.55)		-1.29* (0.64)	-1.52* (0.69)	
Past Neg.	2.39*** (0.35)	1.29*** (0.35)	2.20*** (0.22)	2.22*** (0.22)	1.75*** (0.39)	1.75*** (0.39)	1.42*** (0.41)	0.80* (0.38)	1.21** (0.44)	0.77† (0.43)	2.10*** (0.45)	2.19*** (0.42)
Past Pos.					-0.69 (0.44)	-0.69 (0.44)					-1.39** (0.44)	-1.32** (0.43)
Pres. Fatal.			0.69* (0.30)	0.76* (0.29)	1.84*** (0.52)	1.84*** (0.52)	2.47*** (0.67)	1.49* (0.60)			1.35* (0.55)	1.79** (0.56)
Pres. Hedon. Future	0.83† (0.48)	0.71 ^([○]) (0.43)	0.61† (0.32)	0.58† (0.32)			1.41* (0.56)	1.20* (0.51)	1.68* (0.65)	1.53* (0.62)	1.35* (0.54)	1.50** (0.53)
Agreeablen.												-0.83† (0.43)
Conscient. Extraversion				-0.46 ^([○]) (0.28)						2.27** (0.84)		0.86 ^([○]) (0.59)
Neuroticism		1.62*** (0.23)		-0.56† (0.29)				1.64*** (0.27)		-1.31* (0.50)		1.01* (0.46)
Openness								0.75** (0.27)				-1.10* (0.45)
rMEQ								-0.15* (0.07)				
adj. R ²	.222	.370	.239	.247	.299	.299	.270	.421	.173	.266	.304	.336

cons. adj. R^2	.206	.340	.232	.233	.286	.259	.261	.398	.121	.185	.300	.315
RSS	2831.40	2282.70	5625.10	5539.10	1958.20	1958.20	2263.70	1774.10	778.38	666.53	2236.7	2108.4
df	202	201	445	443	164	164	164	162	84	81	164	162
F	48.32***		3.44*			---	22.35***		4.53**		4.93**	

Note. If not otherwise indicated, unstandardized estimates (b-values) are reported with standard errors in brackets. The F-test compares the models within each country (ZTPI, sex, and age vs. ZTPI, sex, age, BFI, rMEQ). *** $p < .001$; ** $p < .01$; * $p < .05$; † $p < .10$, n.s.; ^() $p > .10$, n.s.; adj. R^2 = adjusted R^2 ; cons. adj. R^2 = conservative adjusted R^2 (cf. Harrell, 2001); RSS = residual sum of squares; F = F test statistic; df = degrees of freedom; p = p -value.

461 **Table 5.** Final models for depression after stepwise regression (country-wise, with two models each (1st: ZTPI, sex, and age as predictors; 2nd =
462 extended: ZTPI, sex, age, BFI, and rMEQ as predictors)).

Country	Argentina (n = 206)		France (n = 449)		Greece (n = 169)		Italy (n=170)		Japan (n = 87)		Turkey (n = 171)	
Scales	ZTPI	extended	ZTPI	extended	ZTPI	extended	ZTPI	extended	ZTPI	extended	ZTPI	extended
Age	-0.04† (0.02)		-0.04** (0.01)	-0.04** (0.01)			-0.06* (0.02)	-0.06* (0.02)			-0.16* (0.06)	-0.11† (0.07)
Sex (M)	- 1.82*** (0.52)	-1.67** (0.53)					-1.08* (0.47)	-1.10* (0.48)			-0.99 ⁽¹⁾ (0.61)	-0.91 ⁽¹⁾ (0.60)
Past Neg.	1.77*** (0.32)	1.12** (0.36)	1.28*** (0.24)	1.28*** (0.24)	1.56*** (0.39)	1.53*** (0.39)	1.14*** (0.33)	1.10** (0.33)			1.07** (0.39)	1.16** (0.38)
Past Pos.	-0.74† (0.42)	-0.89* (0.41)	-0.62* (0.26)	-0.62* (0.26)	-1.24** (0.43)	-1.49*** (0.43)			-1.20* (0.55)	-1.20* (0.55)	-1.43*** (0.38)	-1.37*** (0.38)
Pres. Fatal.			1.12*** (0.32)	1.12*** (0.32)	0.92† (0.53)	1.16* (0.52)	1.50** (0.54)	1.28* (0.55)			0.87† (0.47)	0.90† (0.46)
Pres. Hedon. Future			-0.82* (0.32)	-0.82* (0.32)			-0.94† (0.54)	-1.04† (0.55)				
									-2.34*** (0.68)	-2.34*** (0.68)		
Agreeablen.												-0.93* (0.38)
Conscient. Extraversion						0.79† (0.44)		0.62* (0.25)				
Neuroticism		0.98*** (0.23)						0.40† (0.24)				
Openness		-0.57† (0.29)				-0.72* (0.31)						
rMEQ						-0.13† (0.07)						-0.08 (0.06)
adj. R ²	.197	.257	.181	.181	.218	.263	.202	.234	.188	.188	.212	.238

cons. adj. R^2	.169	.226	.177	.166	.198	.230	.192	.205	.136	.065	.202	.209
RSS	2508.70	2266.90	5650.80	5650.80	1988.3	1838.5	1417.80	1343.40	921.52	921.52	1738.20	1660.50
F	10.67***		---		4.40**		4.49*		---		3.81*	
df	202	200	443	443	165	162	164	162	84	84	165	163

Note. If not otherwise indicated, unstandardized estimates (b-values) are reported with standard errors in brackets. The F-test compares the models within each country (ZTPI, sex, and age vs. ZTPI, sex, age, BFI, rMEQ). *** $p < .001$; ** $p < .01$; * $p < .05$; † $p < .10$, n.s.; ^() $p > .10$, n.s.; adj. R^2 = adjusted R^2 ; cons. adj. R^2 = conservative adjusted R^2 (cf. Harrell, 2001); RSS = residual sum of squares; F = F test statistic; df = degrees of freedom; p = p -value.

DISCUSSION

The aim of this study was to assess personality traits and psychological wellbeing of people from six countries during the COVID-19 pandemic. More specifically, we aimed at giving a snapshot of the levels of anxiety and depression during the first weeks of the pandemic in spring 2020, looking at differences between countries, ages, and sex. We found that there were significant differences between countries. For instance, Japanese and Greek participants reported low levels of anxiety whereas Turkish exhibited the highest scores; and on the HADS depression subscale, Italian participants reported the lowest levels while Japanese scored highest.

Our results are in line with the meta-analysis conducted by Salari and colleagues (2020), who reported that women and young people experienced higher levels of depression and anxiety (than men and older individuals) during the COVID-19 outbreak. Over the whole sample and across countries, we found a significant effect of sex on both anxiety and depression showing that females reported higher levels of anxiety and depression than males. Additionally, we found that irrespective of country, the younger the participants, the higher they scored on both anxiety and depression scales.

Furthermore, we analyzed whether and to what extent relatively time-stable personality traits of time perspectives, chronotype, and the Big Five could predict the reported levels of anxiety and depression. The literature reports an association of time perspectives with psychological well-being (Zimbardo & Boyd, 1999; Desmyter & De Raedt, 2012). Similarly, our results consistently showed effects of the Past Negative subscale on anxiety in all the tested countries (Argentina, France, Greece, Italy, Japan, and Turkey) and depression in all countries except Japan. A more negative vision of the past, characterized by negative memories and regrets, seems to be predictive of increased symptoms of both anxiety and depression during confinement. The Present Fatalistic subscale also predicted lower levels of depression and anxiety in many countries but was not as consistent a predictor as Past Negative. Instead, for depression, Past Positive was a negative predictor for many countries (except for Italy). Additionally, the Present Hedonistic factor negatively predicted depression in France only

492 and positively predicted anxiety in the Japanese sample only. Future orientation was a significant
493 negative predictor for depression in Japan, and positively predicted anxiety in Italy and Turkey.
494 Importantly, the time perspective subscales were retained as predictors once the Big Five and rMEQ
495 (chronotype) were added as potential predictors in the extended model.

496 Interestingly, Japan showed a pattern different from all the other countries. Next to the Past
497 Negative factor as also commonly observed in other countries, the Present Hedonistic perspective
498 was a predictor of higher levels of anxiety. Sex, Extraversion, and Neuroticism added explanatory
499 power to the model for anxiety. Past Positive and Future orientation both negatively predicted
500 depression and were the only relevant variables retained in the final model. What are the possible
501 reasons for these differing results with the Japanese sample compared to the other countries? Next to
502 possible (speculative) cultural explanations, the Japanese sample differs from the other countries in
503 that it is much smaller than the others, participants were paid for partaking in the study, the sample's
504 age was more evenly distributed (similar to France), and it is the only country where there was no
505 strict lockdown (as reflected in the mobility and stringency indices in Table 2).

506 The Big Five Inventory did not contribute in a consistent way to the final regression models;
507 however, some of the factors were retained in some of the countries. Neuroticism was included in the
508 final model for anxiety in most of the countries, but the direction of the effect was not consistent:
509 neuroticism was a positive predictor in Argentina, Italy, and Turkey, whereas it negatively predicted
510 anxiety in France and Japan, and was non-significant in Greece. Nevertheless, the Big Five scales
511 added explanatory power in the models for anxiety (considerably in Argentina, Italy, Japan, but just
512 a bit in Turkey) and for depression (considerably in Argentina, but just a bit in Greece, Italy, and
513 Turkey) even when considering the conservative adjusted R^2 . Generally, both the model with ZTPI,
514 sex, and age and the extended model with additional predictors, BFI, and , accounted for more
515 variance in the models predicting the scores on the HADS anxiety subscale than those predicting
516 scores on the depression subscale.

Acknowledgements

We are grateful to Bernadette Martins (CEA, NeuroSpin) for her support on the ethical aspects of the protocol (CER-Paris-Saclay-2020-020). We thank Maryline Hevin (CEA, NeuroSpin) for administrative, and numerous communication channels that have relayed and advertised the study: Christine Doublé (CEA, Neurospin), Laure Belot (Le Monde), Cécile Chevallier (Le Parisien). We thank Brill Publishing for sponsoring tokens in Gorilla. This work was also carried out within the scope of the project “Use-inspired basic research”, for which the Department of General Psychology of the University of Padova has been recognized as “Dipartimento di Eccellenza” by the Ministry of University and Research.

We also acknowledge all other researchers of the consortium that have enabled the collection and/or analysis of the data: Federico Alvarez Igarzábal, Fuat Balci, Maximilien Chaumon, Arnaud D’Argembeau, Elisa M. Gallego Hiroyasu, Anne Giersch, Claude Gronfier, Sophie K. Herbst, André Klarsfeld, Ljubica Jovanovic, Elisa Lannelongue, Ramya Mudumba, Cyril Nicolai, Serife Leman Runyun, Narayanan Srinivasan, Shogo Sugiyama, Rania Tachmatzidou, Vassilis Thanopoulos, Argiro Vatakis, Anna Wagelmans, Marc Wittmann, Yuko Yotsumoto.

Conceptualization: SG, GM, NC; Data curation: NC, LM, SLK; Formal analysis: NC, LM, SLK; Funding acquisition: GM, SG, VVW; Investigation: LM, GM, NC, SG, VVW, SLK, EMD, PAR; Methodology: VVW, GM, SG, NC, LM, SLK; Project administration: GM; Resources: GM, NC, SG, VVW; Software: LM, GM, NC, SG, PAR, EMD, SLK, VVW; Supervision: GM, NC, SG, VVW; Roles/Writing - original draft: LM, SLK; Writing - review & editing: SG, VVW, GM, NC, PAR, SLK, LM.

Data Availability Statement: The data that support the findings of this study are available from the corresponding author upon reasonable request.

REFERENCES

- Adan, A. & Almirall, H. (1991). Horne & Östberg Morningness-Eveningness Questionnaire: A Reduced Scale. *Personality and Individual Differences*, 12(3), 241-253.
- An, H., & Gu, L. (1989). Fast Stepwise Procedure of Selection of Variables by Using AIC and BIC Criteria. *ACTA Mathematicae Applicatae Sinica*, 5(1), 60-67.
- Avni-Babad, D., & Ritov, I. (2003). Routine and the perception of time. *Journal of Experimental Psychology: General*, 132(4), 543.
- Brooks, S. K., Webster, R. K., Smith, L. E., Woodland, L., Wessely, S., Greenberg, N., & Rubin, G. J. (2020). The psychological impact of quarantine and how to reduce it: rapid review of the evidence. *The lancet*, 395(10227), 912-920.
- Cellini, N., Canale, N., Mioni, G., & Costa, S. (2020). Changes in sleep pattern, sense of time and digital media use during COVID-19 lockdown in Italy. *Journal of Sleep Research*, 29(4), e13074.
- Cheng, C., Jun, H., & Liang, B. (2014). Psychological health diathesis assessment system: a nationwide survey of resilient trait scale for Chinese adults. *Studies of Psychology and Behavior*, 12(6), 735.
- Cox, R. C., & Olatunji, B. O. (2019). Differential associations between chronotype, anxiety, and negative affect: A structural equation modeling approach. *Journal of affective disorders*, 257, 321-330.
- Crawford, J.R., Henry, J. D., Crombie, C., & Taylor, E. P. (2001). Normative data for the HADS from a large non-clinical sample. *British Journal of Clinical Psychology*, 40, 429-434.
- Desmyter, F., & De Raedt, R. (2012). The relationship between time perspective and subjective well-being of older adults. *Psychologica Belgica*, 52(1), 19-38.
- Droit-Volet, S., S, Gil, S., Martinelli, N., Andant, N., Clinchamps, M., Parreira, L., et al. (2020) Time and Covid-19 stress in the lockdown situation: Time free, «Dying» of boredom and sadness. *PLoS ONE*, 15(8): e0236465. <https://doi.org/10.1371/journal.pone.0236465>

- 594 Fox, J. (2005). Linear Models, Problems. In K. Kempf-Leonard (Ed.), *Encyclopedia of Social*
595 *Measurement* (pp.515-522). Cambridge, MA, USA: Elsevier Academic Press.
- 596 Galea, S., Merchant, R. M., & Lurie, N. (2020). The mental health consequences of COVID-19 and
597 physical distancing: the need for prevention and early intervention. *JAMA Internal*
598 *Medicine*, 180(6), 817-818.
- 599 Gallucci, M. (2019). *GAMLj: General analyses for linear models*. [jamovi module]. Retrieved from
600 <https://gamlj.github.io/>
- 601 Grondin, S., Mendoza-Duran, E., & Rioux, P. A. (2020). Pandemic, Quarantine, and Psychological
602 Time. *Frontiers in Psychology*, 11. <https://doi.org/10.3389/fpsyg.2020.581036>
- 603 Hair, J.F., Risher, J.J., Sarstedt, M., & Ringle, C.M. (2019). When to use and how to report the results
604 of PLS-SEM. *European Business Review*, 31(1), 2-24. [https://doi.org/10.1108/EBR-11-2018-](https://doi.org/10.1108/EBR-11-2018-0203)
605 0203
- 606 Hale, T., Angrist, N., Goldszmidt, R., Kira, B., Petherick, A., Phillips, T., Webster, S., Cameron-
607 Blake, E., Hallas, L., Majumdar, S., & Tatlow, H. (2021). A global panel database of
608 pandemic policies (Oxford COVID-19 Government Response Tracker). *Nature Human*
609 *Behaviour*, 5, 529-538. <https://doi.org/10.1038/s41562-021-01079-8>
- 610 Harrell, F. E. (2001). *Regression modeling strategies: with applications to linear models, logistic*
611 *regression, and survival analysis*. Springer.
- 612 Jochemczyk, Ł, Pietrzak, J., Buczkowski, R., Stolarski, M., & Markiewicz, Ł (2017). You Only Live
613 Once: Present-hedonistic time perspective predicts risk propensity. *Personality and Individual*
614 *Differences*, 115, 148-153. <https://doi.org/10.1016/j.paid.2016.03.010>
- 615 Kairys, A., & Liniauskaite, A. (2015). Time Perspective and Personality. In: M. Stolarski, N.
616 Fieulaine, & W. Beek (Eds.), *Time perspective theory; review, research and application* (pp.
617 99-113). Springer, Cham.
- 618 Kotov, R., Gamez, W., Schmidt, F., & Watson, D. (2010). Linking “big” personality traits to anxiety,
619 depressive, and substance use disorders: a meta-analysis. *Psychological bulletin*, 136(5), 768.

620 Kivelä, L., Papadopoulos, M. R., & Antypa, N. (2018). Chronotype and psychiatric
621 disorders. *Current sleep medicine reports*, 4(2), 94-103.

622 Li, Y., Qin, Q., Sun, Q., Sanford, L. D., Vgontzas, A. N., & Tang, X. (2020). Insomnia and
623 psychological reactions during the COVID-19 outbreak in China. *Journal of Clinical Sleep*
624 *Medicine*, 16(8), 1417-1418.

625 Merikanto, I., Kronholm, E., Peltonen, M., Laatikainen, T., Vartiainen, E., & Partonen, T. (2015).
626 Circadian preference links to depression in general adult population. *Journal of Affective*
627 *Disorders*, 188, 143-148.

628 Moghanibashi-Mansourieh, A. (2020). Assessing the anxiety level of Iranian general population
629 during COVID-19 outbreak. *Asian journal of psychiatry*, 51, 102076.

630 Nowack, K., & Van Der Meer, E. (2013). Are larks future-oriented and owls present-oriented? Age-
631 and sex-related shifts in chronotype–time perspective associations. *Chronobiology*
632 *international*, 30(10), 1240-1250.

633 Ogden, R. S. (2020). The passage of time during the UK Covid-19 lockdown. *PLoS ONE*, 15(7),
634 e0235871. <https://doi.org/10.1371/journal.pone.0235871>

635 Papastamatelou, J., Unger, A., Giotakos, O., & Athanasiadou, F. (2015). Is time perspective a
636 predictor of anxiety and perceived stress? Some preliminary results from
637 Greece. *Psychological Studies*, 60(4), 468-477.

638 Rammsted, B. & John, O. P. (2007). Measuring personality in one minute or less: A 10-item short
639 version of the Big Five Inventory in English and German. *Journal of Research in Personality*,
640 41, 203-212.

641 Ruengvirayudh, P., & Brooks, G. P. (2016). Comparing Stepwise Regression Models to the Best-
642 Subsets Models, or, the Art of Stepwise. *General Linear Model Journal*, 42(1), 1-14.

643 Salari, N., Hosseini-Far, A., Jalali, R., Vaisi-Raygani, A., Rasoulpoor, S., Mohammadi, M., ... &
644 Khaledi-Paveh, B. (2020). Prevalence of stress, anxiety, depression among the general

645 population during the COVID-19 pandemic: a systematic review and meta-
646 analysis. *Globalization and health*, 16(1), 1-11.

647 Sircova, A., Van De Vijver, F. J., Osin, E., Milfont, T. L., Fieulaine, N., Kislali-Erginbilgic, A., ... &
648 Boyd, J. N. (2014). A global look at time: A 24-country study of the equivalence of the
649 Zimbardo Time Perspective Inventory. *Sage Open*, 4(1), 2158244013515686.

650 Sircova, A., Van De Vijver, F. J., Osin, E., Milfont, T. L., Fieulaine, N., Kislali-Erginbilgic, A., &
651 Zimbardo, P. G. (2015). Time perspective profiles of cultures. In: M. Stolarski, N. Fieulaine,
652 & W. Beek (Eds.), *Time perspective theory; review, research and application* (pp. 169-187).
653 Springer, Cham.

654 Stolarski, M., Ledzińska, M., & Matthews, G. (2013). Morning is tomorrow, evening is today:
655 Relationships between chronotype and time perspective. *Biological Rhythm Research*, 44(2),
656 181-196.

657 Stolarski, M., Zajenkowski, M., Zajenkowska, A. (2016). Aggressive? from Time to Time...
658 Uncovering the Complex Associations between Time Perspectives and Aggression. *Current*
659 *Psychology*, 35, 506-515. <https://doi.org/10.1007/s12144-016-9422-6>

660 Thompson, B. (1989). Why won't stepwise methods die? Measurement and Evaluation in Counseling
661 and Development, 21(4), 146-148.

662 Van Beek, W., Berghuis, H., Kerkhof, A., & Beekman, A. (2011). Time perspective, personality and
663 psychopathology: Zimbardo's time perspective inventory in psychiatry. *Time &*
664 *society*, 20(3), 364-374.

665 van Wassenhove, V., Balci, F., Giersch, A., Gronfier, C., & Vatakis, A. (2020, August 28).
666 *TimeSocialDistancing*. <https://doi.org/10.17605/OSF.IO/9E324>

667 Wang, C., Pan, R., Wan, X., Tan, Y., Xu, L., Ho, C. S., & Ho, R. C. (2020). Immediate Psychological
668 Responses and Associated Factors during the Initial Stage of the 2019 Coronavirus Disease
669 (COVID-19) Epidemic among the General Population in China. *International Journal of*
670 *Environmental Research and Public Health*, 17(5), 1729.

671 <https://doi.org/10.3390/ijerph17051729>

672 Wauthia, E., Lefebvre, L., Huet, K., Blekic, W., El Bouragui, K., & Rossignol, M. (2019). Examining
 673 the hierarchical influences of the Big-Five dimensions and Anxiety Sensitivity on anxiety
 674 symptoms in children. *Frontiers in psychology*, *10*, 1185.

675 Wittmann, M. (2020). Subjective Passage of Time during the Pandemic: Routine, Boredom, and
 676 Memory. *KronoScope*, *20*(2), 260-271.

677 Yamashita, T., Yamashita, K., & Kamimura, R. (2007) A Stepwise AIC Method for Variable
 678 Selection in Linear Regression, *Communications in Statistics—Theory and Methods*, *36*:13,
 679 2395-2403, DOI: 10.1080/03610920701215639

680 Zigmond, A. S., & Snaith, R.P. (1983). The Hospital Anxiety and Depression Scale. *Acta*
 681 *Psychiatrica Scandinavica*, *67*,361-370.

682 Zimbardo, P. G., & Boyd, J. N. (1999). Putting time in perspective: A valid, reliable individual-
 683 differences metric. In *Time perspective theory; review, research and application* (pp. 17-55).
 684 Springer, Cham.

685 Zimbardo, P., & Boyd, J. (2008). *The time paradox: The new psychology of time that will change*
 686 *your life*. Simon and Schuster.