# SAPIENZA
## UNIVERSITÀ EDITRICE

# The social pandemic from SARS-CoV-2 among Italian university students: a pilot study

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## Article info

## Abstract

The impact of restrictions on movement resulting from the SARS-CoV-2 pandemic may contribute to a disruption of mental health in young people during this era. In March 2021, lockdown restrictions were enforcing national policies of tackling the infectious disease across the globe. In the early stages of the vaccination rollout, public enquires on confidence to endure the virus pandemic have shown high levels of psychological distress. Under the above circumstances, 333 university students were asked to fill in an online-based survey on alcohol consumption, compulsive behavior as a loss of control over eating, fear of weight changes, excessive sleepiness and sleep deprivation. Text mining and multiple correspondence analysis were employed to analyze qualitative data on the lived experience against the occurrence of health-related behaviors. Data analyses have showed that the pandemic was associated with a mixed breakup of clustered lemmas based on sex, age, and relationship status. The extent to which the participants have reported a lower degree of satisfaction on living arrangements, intimate and family relationships were interpreted as meaningfully related with a more negative lived experience. Social confinement has resulted as an immediate action for mitigating a public health crisis from the SARS-CoV-2 disease. Incidentally, social measures to mitigate the virus transmission have sought to protect internal collapse of the health care systems by reducing the number of casualties. Conversely, these findings provide new evidence on the social determinants of health among youth and consequently highlight the potential interference from missing social interactions in the COVID-19 pandemic response.

**Keywords**: COVID-19; emotions; health behavior; social ties; university students.

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## Introduction

The SARS-CoV-2 pandemic has exposed humanity to fear of contagion (Van Bavel et al., 2020) and prompted scientific endeavors in discovering and administering vaccines (Bloom et al., 2021). Infection risks, fatality rates, and disruption of national health services have led to a variety of policy responses to virus containment (Anderson et al., 2020; Manica et al., 2021), and some of those policies have caused significant hardship through their imposition of societal restrictions on their communities (Morgan et al., 2021).

Physical distancing, self-isolation, quarantine, hospitalization, and recovery from SARS-CoV-2 infections have resulted in urgent health burdens (Al-Aly et al., 2021) in the form of severe public costs — in particular, the onset, comorbidity, and exacerbation of physical and mental illnesses (Abrams & Szefler, 2020; Escandón et al., 2021; Nikoloski et al., 2021; Teach & Geme, 2021), whereby a sequela of the disease has emerged in terms of pandemic injustice in health care (Gilmore-Bykovskyi et al., 2021; Padmanabhan, 2021). Under these exceptional circumstances, the nature of social development and interaction among youth has been undermined by a temporary inability for individuals to share their interests with others, to experience social overtures and a complex understanding of peers induced by physical contact (Orben et al., 2020), and to respond to new challenges and have a more nuanced social perspective compared with a pre-pandemic social environment that was largely taken for granted (see Eisenberg & Fabes, 1992).

A perspective on which social meanings would emerge from the pandemic have referred to either personal or collective crises, involving health workers on the frontline (Marinaci et al., 2021), and stress-related clinical and pathological features over the fear of infection (Tambelli et al., 2021). While a pre-existing vulnerability to stress has supposed to influence individual and dyadic processes in response to the pandemic outbreaks (Pietromonaco & Overall, 2021), previous studies have found that anxiety and depression predicted hopelessness after a period of social isolation (Amendola et al., 2021) and milder symptoms of psychological distress were tied to optimism and hopefulness (Tommasi et al., 2020). On this basis it is argued that technological exaptation and evolution have helped to develop innovative solutions (Ardito et al., 2021). Specifically, digital applications and continuity have ensured regular education and social support, whereby a commercial use of distance education technologies has contributed to the ongoing debate on digital transformation and learning loss (Williamson et al., 2021). The pandemic disruption has in turn solicited a more-in-depth comprehension on the potential benefits of technology through the provision of telehealth services (Monaghesh & Hajizadeh, 2020). Furthermore, the unlimited usability features of digital tools have prompted an immediate response and threats, whereas unequal access was emerging in home-schooling and crisis of information spread on social media (Hantrais et al., 2021). Social isolation has led to an increased risk of nomophobia in young females (Caponnetto et al., 2021), alcohol and tobacco consumption (Dubey et al., 2020). In other terms, the virus breach has evoked fear-related emotions (Mazzuca et al., 2021) and has

showed a lower ability to regulate those emotions in older adults (Pezzuti et al., 2021). To determine the presence of negative expectations and death-thought among the elderly would serve another purpose of protecting them from increased mortality risks related to age patterns and health status (Goldstein et al., 2021). From a developmental perspective of health in the life course (Halfon et al., 2014), the role of reported loneliness and a loss of structured in-person school have raised major concerns into the long-term effects on mental health (Power et al., 2020), including the emerging psychosocial consequences in adolescence (Wang et al., 2022).

One method of investigation for studying human development suggests that "a person is affected by aspects of their environments that previously have been made meaningful and therefore salient by that very person" (Cornejo et al., 2018, p. 2). As a potential tool of inquiry into the affective-sensitive dimension of psychological life, the affective nature of human social relationships with the environment can be assumed (Valsiner et al., 2016). In support of these sense-making theories, an individual's concrete actions in human-meaning construction serve to provide an affective personal sense. Nevertheless, the essential role of education for sense-making is somewhat considered intangible and hidden, a process through which the child development takes place in-between social settings and where the complexities of ever-evolving mechanisms have unveiled new acquisitions into physical and symbolic borders (Marsico, 2018).

While there is both prior and emerging evidence on the health-related risks of social deprivation (Morina et al., 2021), the long-term consequences from reduced physical contacts and societal restrictions remain largely unknown. Being and feeling socially isolated have previously shown to contribute with early mortality and relate to health risk behavior (Cacioppo & Cacioppo, 2014). Further evidence has showed that social development of youths has changed over the pandemic outbreaks, in terms of decrease in social interactions after school closed and increased depressive symptoms one year later (Gadassi Polack et al., 2021).

In the present study, we examined behavioral patterns within a university student population. Data collection was undertaken during the most severe level of restrictions on movement in Italy, which was precipitated by a national emergency declaration for SARS-CoV-2 infection rates. Regional lockdowns were in force since October 2020 with stop-and-go policies and recommended social distancing measures (Gros & Gros, 2021). In this context, our aim was to investigate what societal challenges emerged from self-reported measures and mixed methods analysis, as well as to explore which relationships, if any, were possible to infer as moderating certain social consequences of the pandemic. A major study focus was on how either behavior or social satisfaction was somehow related to the experiences of lockdown, and in what capacity the effects from a prolonged state of reported challenges have the potential to affect mental health of young people. Overall, the present study was aimed to explore and explain the complexity of the underlying psychosocial mechanisms that may trigger health-related behaviors, negative emotions and thinking during exceptional circumstances of limited physical contacts. For the main purpose of these findings, new evidence has shown how young people experienced the lockdown caused

by the 2019 coronavirus disease (COVID-19), and what the consequences of this exceptional situation have represented on their mental health.

## Materials and Methods

### Recruitment

A self-completion questionnaire designed for the general population was administered to a non-random and self-selected sample of university students via an electronic form. Ethical standards were met through data-protection regulations in compliance with the procedures on research integrity at the University of Salerno. Participants were enrolled from online classes taught at the Department of Human, Philosophical, and Educational Sciences and were provided an informed consent form for their voluntary participation. Respondents were informed that the study was led by the GRIS -Research Group on Social Interactions[1] with the goal of collecting anonymous data on alcohol consumption, social satisfaction, and lived experiences during the COVID-19 pandemic. No compensation was given for participation.

### Key measures

For the demographic questions, we included an adaption of Item Four (Q1) from the *Fagerström Test for Nicotine Dependence* (Heatherton et al., 1991). Response options were: Non-smoking (0 points); 5 or fewer cigarettes per day (1 point); 6 to 10 (2 points); 11 to 20 (3 points); 21 to 30 (4 points); and 31 or more (5 points).

Under the second section of the questionnaire, participants were asked questions regarding their health-related behavioral patterns in the previous 12 months. The following items were included:
Q2. How frequently have you been sleeping more than necessary?
Q3. How frequently have you been sleeping less than necessary?
Q4. Have you ever been in dread of losing or gaining weight?
Q5. Have you ever had the feeling of being out of control with food intake?

Response options were: "Never" (0 points); "Rarely" (1 point); "Sometimes" (2 points); "Most of the Time" (3 points); and "Always" (4 points).

The sequential three items (Q6 to Q8) were from an Italian adaptation of the *Alcohol Use Disorders Identification Test Consumption* (Bush et al., 1998; Scafato et al., 2016), commonly known as the AUDIT-C. The bottom of the second section consisted of an additional four items (Q9 to Q12) from the *CAGE questionnaire* (Mayfield et al., 1974).

The third section, consisting of eight items (Q13 to Q20) from the *Social Satisfaction Questionnaire* (SSQ; Raistrick et al., 2007), used the previous 30 days as the reference period. A fourth and final section consisted of the following open-ended question: "Please describe your personal experience of the

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[1]    https://sites.google.com/unisa.it/gris

COVID-19 pandemic to date up to a maximum of 20 words. You may refer to your thoughts, emotions, or specific - actual or imagery happenings. Please answer in the next 5 minutes".

For practical reasons, questionnaire items about illegal or prescription drugs that might lead to prestige bias (Jiménez & Mesoudi, 2019) were not included. The Italian translation of the items was either from previous studies or involved a back-translation procedure. Participants were required to complete each item, apart from Question 2 of the AUDIT-C (Q7).

### Participants

We recruited 333 respondents between March 29th and April 15th, 2021. The study sample consisted of 42 men and 291 women (Mean Age = 22.77, SD = 4.863). One respondent's questionnaire was excluded because the response was submitted after lockdown restrictions had been eased. Other demographic variables are presented in Table I, including invalid responses from level of education and corresponding year of graduation.

**Tab. 1**. Demographic Variables

| Variable[a] | Sample (n) | Percent (%) | Population (N) | Percent (%) |
|---|---|---|---|---|
| **Sex** | | | | |
| Male | 42 | 12.6 | 1034 | 23.9 |
| Female | 291 | 87.4 | 3293 | 76.1 |
| | | | | |
| **Age group** | | | | |
| ≤ 22 | 182 | 54.7 | 1613 | 37.3 |
| >22 | 151 | 45.3 | 2714 | 62.7 |
| | | | | |
| **Level of education** | | | | |
| University degree | 67 | 20.1 | | |
| High school | 253 | 76.0 | | |
| Invalid | 13 | 3.9 | | |
| | | | | |
| **Year of graduation** | | | | |
| Up to 2016 | 110 | 33.0 | | |
| 2017 to 2018 | 35 | 10.5 | | |
| 2019 | 71 | 21.3 | | |
| 2020 | 102 | 30.6 | | |
| Invalid | 15 | 4.5 | | |
| | | | | |
| **Relationship status** | | | | |
| Engaged | 206 | 61.9 | | |
| Non-engaged | 127 | 38.1 | | |
| | | | | |
| **Employment** | | | | |
| Employed | 30 | 9.0 | | |
| Non-employed | 303 | 91.0 | | |

*Note.* a. Responses were treated as invalid data when they expressed a level of education more than high school and an expected year of graduation.

*Data analysis*

Analysis was performed using the R software (R Core Team, 2020). Because men and older participants were under-represented in the observed sample, we used weighting values to manage imbalanced data sampling. A joint distribution for variables Sex and Age was retrieved from academic archives and applied to determine the scores of the post-stratification weighting scheme (Smith, 1991).

For the sole purpose of the Multiple Correspondence Analysis (Abdi & Williams, 2010), a reduced subspace was selected before using distance matrix among observations from SSQ and CAGE items as an input for the Hierarchical Clustering algorithm, and after applying Ward's criterion (Gordon, 1999). Subsequent analysis was carried out using the *FactoMineR* package (Lê et al., 2008).

The Correspondence Analysis (CA) technique was adapted to lexical tables (Benzecri, 1992) and employed for textual data mining (Feinerer et al., 2008). A preprocessing phase in data cleaning was used for text lemmatization to obtain the lexical table T (Lemma x Document), whose generic element tij represents the number of occurrences of the i-th form in the j-th document. Accordingly, words' occurrences from the open-ended question were investigated by applying the Term Frequency scaled by the Inverse Document Frequency scheme (TF-IDF; Salton & Buckley, 1988).

The need for data reduction was obtained through the Singular Value Decomposition (SVD) of data table, which resulted in the Lexical Correspondence Analysis (LCA). Lastly, the Clustering Analysis of lemmas was used to interpret homogeneous groups of words and to represent the common language expressed by respondents in the open-ended question. The final data set resulted in 160 rows (words) and 318 columns (respondents).

# Results

Whenever lemmas presented an occurrence of twenty or more responses in the data set of the weighted sample, lemma-related words were listed and considered when interpreting and reporting results. Specifically, four main domains were grouped as follows:

1) Individual and relational domain: Including words such as *friend, experience, to be, family, to do, person, to carry, own, respect, life, to live, to want.*
2) Spatial-temporal domain: Including words such as *year, change, never, very, every, period, first, to succeed, always, same, much, time, to go out, to see.*
3) Emotional-related domain: Including words such as *anxiety, freedom, fear, power, to feel, to hope.*
d) Situational domain: Including words such as *home, what, covid, covid19, to stay, pandemic, part, situation, social, especially.*

Hence, a relevant area of inquiry examined meaningful associations between the vocabulary used by respondents and social satisfaction trajectories. Specific attitudes and beliefs in relation to the COVID-19 pandemic were revealed by items SSQ2 (Q14), SSQ7 (Q19), and SSQ8 (Q20). As a result of

the analysis, the generic cell of the matrix T contained the TF-IDF score. Indeed, the lexical contingency table made by "words per documents" was very large and had few entries.

For analytical purposes, four contingency tables from the open-ended question were drawn by aggregating responses based on the following attributes of interest: a) Relationship Status and cross-classification of Sex and Age; b) SSQ2; c) SSQ7; and d) SSQ8. The first two dimensions of analysis showed a total data set inertia of 68.92% (a), 76.29% (b), 71.40% (c), and 74.21% (d), respectively.

*Individual differences in sex, age, and relationship status*

Ascending hierarchical classification of lemmas revealed four main clusters (see Figure 1). Cluster 1 included words such as *lockdown, experience, deprived, forced,* and *restriction,* sharing high frequency for the factors Female > 22 and "Engaged". Cluster 2 included words such as *contact, feeling, loneliness, sadness, study, love, change, person,* and *covid19,* related to Male > 22 and "non-Engaged". Cluster 3 included a common language sited in the center of the map. Cluster 4 included words such as *start, young, pass, mental,* and *lonely,* related to the Male ≤ 22 level.

*The impact of living arrangements*

Ascending hierarchical classification of lemmas revealed three main clusters (see Figure 2). Cluster 1 relates to respondents who were "satisfied" with living arrangements and included words such as *living, possible, new, begin, today, fortunately, freedom,* and *love.* Cluster 2 relates to the "somewhat satisfied" and "unsatisfied" categories and included words such as *relationships, loneliness, unmotivated,* and "*didn't know*". Cluster 3 identifies those who stated they were "very unsatisfied" with their own living arrangements (e.g., "*need everything*", *mental, realize, anxious,* and *anything*).

*The role of a close and intimate relationship*

Ascending hierarchical classification of lemmas revealed three main clusters (see Figure 3). Cluster 1 included words such as *begin, new, live, today, fortunately,* and *person.* Cluster 2 included words such as *totally, alone, affect, away,* and *sadness.* Cluster 3 included words such as *lonely, feeling, tired, contact,* and *work.* Cluster 1 identifies those who are "satisfied" with their own close relationship; Clusters 2 and 3 refer to "unsatisfied" or "very unsatisfied" respondents, respectively.

*Family relationships and interactions*

Ascending hierarchical classification of lemmas revealed four main clusters (see Figure 4). Cluster 1 included words such as *positive, good, loved, hope, soon,* and *live.* Cluster 2 lies in the center of the map, and it is not able to characterize a specific level of satisfaction for family relationships. Cluster 3 includes "very unsatisfied" respondents and is related to

**Fig. 1.** Factor Map of Clustered Lemmas for Relationship Status by Sex and Age



**Fig. 2.** Factor Map of Clustered Lemmas for SSQ2 (Q14)



**Fig. 3.** Factor Map of Clustered Lemmas for SSQ7 (Q19)

Fig. 4. Factor Map of Clustered Lemmas for SSQ8 (Q20)
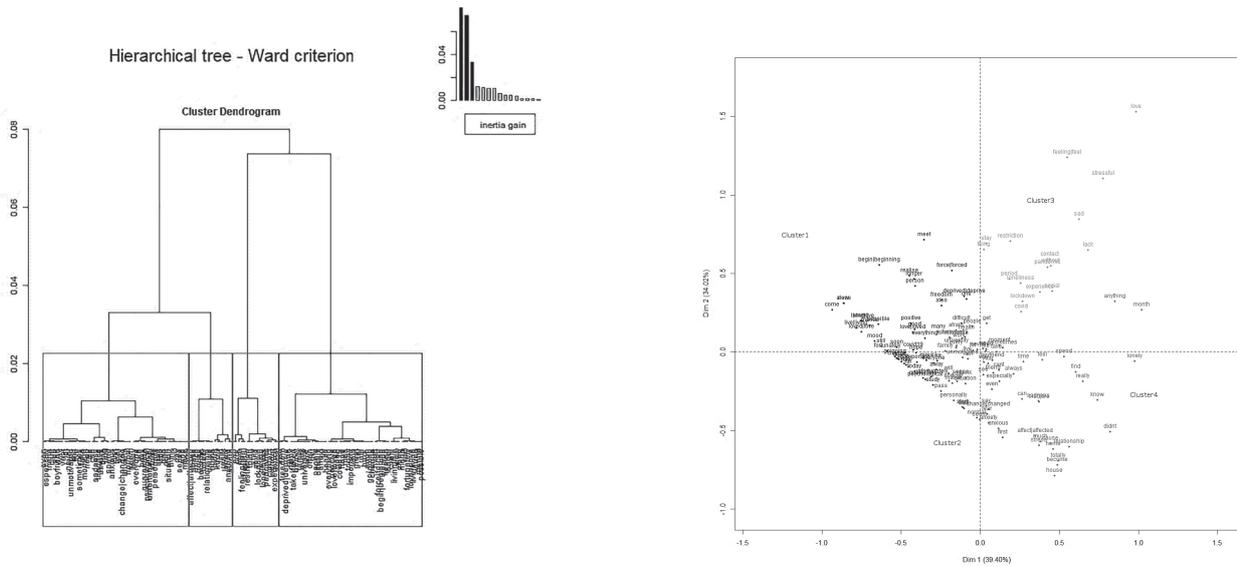


words such as *feeling, love, stressful, sad,* and *lack*. Cluster 4 identifies those who are "somewhat satisfied" with family relationships and who used words such as *home, become, relationship, affect,* and *stress*.

## Discussion

Preventing the spread of the virus has required taking essential precautions in the socio-political agenda, as well as moving the research efforts forward through the development of vaccines and novel treatments. The impact of the COVID-19 pandemic on social ties and health-related behaviours was observed during a single period in human knowledge and its meta-competencies, namely one's own understanding of experience used for describing and manipulating the surrounding world. Throughout a limited timeframe, unstructured health burden of the virus disease was reported in a sample of university students who were engaged in distance learning in the previous twelve months.

The long-term effects from lived experiences were measured in the year 2021 after lockdown regulations resulted in restrictions on movement, non-essential activities were suspended, and a nationwide night-time curfew was imposed. In the previous-year outbreaks, university students' social activities and functioning had been limited in the nationwide population except for late spring, summer, and throughout the Christmas holidays.

Using a multifactorial approach, this study suggested a complex interaction of underlying factors involved with both risks and protective factors of relationships and social confinement. The questionnaire responses from the observed sample showed that 20.1% of participants were smokers (Q1), 15.6% had been sleeping more (Q2), and 31.8% had been sleeping less (Q3) from "Most of the Time" to "Always." A total of 58.3% had been in dread of losing or gaining weight (Q4) and 27.6% (Q5) had been feeling out of control with food intake from "Most of the Time" to "Always".

The alcohol consumption questions (AUDIT-C; Q6 to Q8) regarding problem drinking showed that 34.8% of participants reported drinking six or more drinks at least less than/once per month. The CAGE questions (Q9 to Q12) resulted in 23.7% of participants being screened as positive for at least one question. Likewise, the items from Q13 to Q20 showed a high prevalence of social dissatisfaction (Mean SSQ: 13.697, SD: 4.019) with 67% of participants belonging to a category requiring further clinical attention (SSQ score < 16; Raistrick et al., 2014).

In general, the lockdown restrictions have undoubtedly changed both individual and communities, and a varying degree of responses have elicited negative emotions and cognitions along with social dissatisfaction. In this study, a pattern of composite health-related issues was found through either textual analysis or selected-response items. The major results have showed similarities with distress-related levels that were found throughout the COVID-19 pandemic survey on the Generation Z of US citizens (American Psychological Association, 2020).

Youth development has appeared undermined in its emotional and social domains, and it has been adversely expressed by those who have reported dissatisfaction with living arrangements, intimate relationships, and presence of family. Overall, text analyses for those sub-groups have identified the prevalence of negative terms over the pandemic experience. In our analysis, lemmas have represented unique words that have been produced in the language used by respondents, including a series of connotated as negative and neutral words such as, "*need everything*", *tired, anxious, contact, work, restriction, lockdown, lack, lonely, affect, time, sadness, stressful, covid*.

Given the cross-sectional nature of the study, it was clearly not possible to estimate any differences on the occurrence of behavioral risks compared with a pre-pandemic observation. Current and retrospective measures were mixed on data collection, with the purpose of investigating which roles would have played restrictions on movement, limited in-person interactions, infection transmission and disease.

Female respondents have accounted nearly seven times more the number of male respondents, whilst post-stratification

procedures have showed female students have accounted approximately three times more the number of male students in the population of university students. As reported above, the study sample has included young university students (Mean Age: 22.77, SD = 4.863). Indeed, a total of 76% of study participants has reported to have completed high school and 62.4 % have graduated in the previous four years.

Based on the analysis of demographic variables, the largest sub-group was referring to young undergraduate students enrolled in education studies, which range from three to five years in length according to the Italian university system. Additionally, almost one out of three participants had completed a study programme in 2020, either at university or high school, whereas more than one in three have reported non-engaging in an intimate relationship and less than two in three have reported engaging themselves. Furthermore, non-employed participants have accounted approximately ten times more the number of university students who have reported being employed.

Further to the above limitations, it should be acknowledged for the sake of clarity that it has been beyond our study aims to discriminate between direct and indirect implications of COVID-19. Future research is needed in order to examine developmental processes involved with the "social pandemic", as well as to investigate physical and mental health by using different sampling methods, epidemiological modelling of infection and disease, clinical interviews, and cross-cultural data collection over lockdown and social distancing measures.

According to our findings, the acquisition of relational competencies in adolescence and young adulthood should be investigated wherever social connections from close relationships would have been disrupted or absent. The present study is even raising new challenges ahead on how to help university students to adopt reflective awareness strategies (Savarese et al., 2019) that would consider comorbidities and deal with the occurrence of overlapping health issues. Our results may be supportive for developing and encouraging the adoption of novel prevention measures, evidence-based interventions, and psychosocial programs.

Previous evidence suggests that social relationships would help to recover from mental illness (Schön et al., 2009). Indeed, youth development and health-related concerns over the pandemic need to be re-considered in terms of vulnerabilities and resources, especially for young people where unemployment, economic and social disadvantages have been pre-existing and may constitute potential risk factors other than the pandemic itself. In the light of an emerging evidence, promoting physical and mental health among young people was reported to be crucial (Hawke et al., 2021; Lehmann et al., 2022; Schwartz et al., 2021). Therefore, an increasing availability of resources and reinforcing community efforts should consider how supporting sustainable intervention policies will have to mitigate the "side effects" of the pandemic. In the post-COVID era, teaching coping strategies and enhancing emotional competencies should aim to help at creating health promoting environments and improving health equity.

## Author Contributions

Claudio Russo and Giuseppina Marsico contributed to the study conception and design. Giuseppe Giordano reviewed materials and methods and performed data analysis. All authors approved the final version of the manuscript.

## Compliance with Ethical Standards

### Conflict of interest
The authors declare there are no relevant financial or non-financial interests in any material discussed in this article. Claudio Russo is on a personal employment contract supported by the Campania regional plan 2016 DCA n. 86 for addiction prevention and recovery.

### Funding
The author(s) received no financial support for the research, authorship, and/or publication of this article.

### Ethical approval
All procedures performed in studies involving human participants were in accordance with the ethical standards of the University of Salerno and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

### Informed Consent
Informed consent was obtained from all individual adult participants. Research information included an explanation of the research, the voluntary nature of the study, the right to withdraw, and the principal investigator's name and contact details.

### Supporting Information
Further information on participants, data analysis, and results is available for this article.

## References

Abdi, H., & Williams, L. J. (2010). Principal component analysis. *Wiley Interdisciplinary Reviews: Computational Statistics*, *2*(4), 433–459. doi.org/10.1002/wics.101

Abrams, E. M., & Szefler, S. J. (2020). COVID-19 and the impact of social determinants of health. *The Lancet Respiratory Medicine*, *8*(7), 659–661. doi.org/10.1016/S2213-2600(20)30234-4

Al-Aly, Z., Xie, Y., & Bowe, B. (2021). High-dimensional characterization of post-acute sequelae of COVID-19. *Nature*, 594, 259–264. doi.org/10.1038/s41586-021-03553-9

Amendola, S., Spensieri, V., & Cerutti, R. (2021). Predictors of hopelessness during the first wave of the COVID-19 pandemic in a small sample of Italian adults. *International Journal of Social Psychiatry*, 002076402110039. doi.org/10.1177/00207640211003939

American Psychological Association (2020). Stress in America™ 2020: A National Mental Health Crisis. https://www.apa.org/news/press/releases/stress/2020/sia-mental-health-crisis.pdf

Anderson, R. M., Heesterbeek, H., Klinkenberg, D., & Hollingsworth, T. D. (2020). How will country-based mitigation measures influence the course of the COVID-19 epidemic?

*The Lancet*, *395*(10228), 931–934. doi.org/10.1016/S0140-6736(20)30567-5

Ardito, L., Coccia, M., & Messeni Petruzzelli, A. (2021). Technological exaptation and crisis management: Evidence from COVID-19 outbreaks. *R&D Management*, *51*(4), 381–392. doi.org/10.1111/radm.12455

Benzecri, J.-P. (1992). *Correspondence Analysis Handbook*. Marcel Dekker.

Bloom, D. E., Cadarette, D., Ferranna, M., Hyer, R. N., & Tortorice, D. L. (2021). How new models of vaccine development for COVID-19 have helped address an epic public health crisis. *Health Affairs (Project Hope)*, *40*(3), 410–418. doi.org/10.1377/hlthaff.2020.02012

Bush, K., Kivlahan, D. R., McDonell, M. B., Fihn, S. D., & Bradley, K. A. (1998). The AUDIT alcohol consumption questions (AUDIT-C): An effective brief screening test for problem drinking. *Archives of Internal Medicine*, *158*(16), 1789–1795. doi.org/10.1001/archinte.158.16.1789

Cacioppo, J. T., & Cacioppo, S. (2014). Social Relationships and Health: The Toxic Effects of Perceived Social Isolation. *Social and Personality Psychology Compass*, *8*(2), 58–72. doi.org/10.1111/spc3.12087

Caponnetto, P., Inguscio, L., Valeri, S., Maglia, M., Polosa, R., Lai, C., & Mazzoni, G. (2021). Smartphone addiction across the lifetime during Italian lockdown for COVID-19. *Journal of Addictive Diseases*, *39*(4), 441–449. doi.org/10.1080/10550887.2021.1889751

Cornejo, C., Marsico, G., & Valsiner, J. (2018). "I Activate You to Affect Me": Affectivating as a Cultural Psychological Phenomenon. In C. Cornejo, G. Marsico, & J. Valsiner (Eds.), "*I Activate You To Affect Me*," Annals of Cultural Psychology: Exploring the Frontiers of Mind and Society, (p. 1-11). Vol. 2. Information Age Publishing

Dubey, M. J., Ghosh, R., Chatterjee, S., Biswas, P., Chatterjee, S., & Dubey, S. (2020). COVID-19 and addiction. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews*, *14*(5), 817–823. doi.org/10.1016/j.dsx.2020.06.008

Eisenberg, N., & Fabes, R. A. (1992). Emotion, Regulation, and the Development of Social Competence. In M. S. Clark (Ed.), *Emotion and Social Behavior* (p. 119–150). Sage Publications, Inc.

Escandón, K., Rasmussen, A. L., Bogoch, I. I., Murray, E. J., Escandón, K., Popescu, S. V., & Kindrachuk, J. (2021). COVID-19 false dichotomies and a comprehensive review of the evidence regarding public health, COVID-19 symptomatology, SARS-CoV-2 transmission, mask wearing, and reinfection. *BMC Infectious Diseases*, *21*(1), 710. doi.org/10.1186/s12879-021-06357-4

Feinerer, I., Hornik, K., & Meyer, D. (2008). Text Mining Infrastructure in R. *Journal of Statistical Software*, *25*(5). doi.org/10.18637/jss.v025.i05

Gadassi Polack, R., Sened, H., Aubé, S., Zhang, A., Joormann, J., & Kober, H. (2021). Connections during crisis: Adolescents' social dynamics and mental health during COVID-19. *Developmental Psychology*, *57*(10), 1633–1647. doi.org/10.1037/dev0001211

Gilmore-Bykovskyi, A., Jackson, J. D., & Wilkins, C. H. (2021). The Urgency of Justice in Research: Beyond COVID-19. *Trends in Molecular Medicine*, *27*(2), 97–100. doi.org/10.1016/j.molmed.2020.11.004

Goldstein, J. R., Cassidy, T., & Wachter, K. W. (2021). Vaccinating the oldest against COVID-19 saves both the most lives and most years of life. *Proceedings of the National Academy of Sciences*, *118*(11), e2026322118. doi.org/10.1073/pnas.2026322118

Gordon, A. (1999). *Classification*, *2nd Edition* (Vol. 16). Chapman and Hall/CRC. doi.org/10.1201/9781584888536

Gros, C., & Gros, D. (2021). The economics of stop-and-go epidemic control. *Socio-Economic Planning Sciences*, 101196. doi.org/10.1016/j.seps.2021.101196

Halfon, N., Larson, K., Lu, M., Tullis, E., & Russ, S. (2014). Lifecourse Health Development: Past, Present and Future. *Maternal and Child Health Journal*, *18*(2), 344–365. doi.org/10.1007/s10995-013-1346-2

Hantrais, L., Allin, P., Kritikos, M., Sogomonjan, M., Anand, P. B., Livingstone, S., Williams, M., & Innes, M. (2021). Covid-19 and the digital revolution. *Contemporary Social Science*, *16*(2), 256–270. doi.org/10.1080/21582041.2020.1833234

Hawke, L. D., Monga, S., Korczak, D., Hayes, E., Relihan, J., Darnay, K., Cleverley, K., Lunsky, Y., Szatmari, P., & Henderson, J. (2021). Impacts of the COVID -19 pandemic on youth mental health among youth with physical health challenges. *Early Intervention in Psychiatry*, *15*(5), 1146–1153. doi.org/10.1111/eip.13052

Heatherton, T. F., Kozlowski, L. T., Frecker, R. C., & Fagerström, K. O. (1991). The Fagerström Test for Nicotine Dependence: A revision of the Fagerström Tolerance Questionnaire. *British Journal of Addiction*, *86*(9), 1119–1127. doi.org/10.1111/j.1360-0443.1991.tb01879.x

Jiménez, Á. V., & Mesoudi, A. (2019). Prestige-biased social learning: Current evidence and outstanding questions. *Palgrave Communications*, *5*(1). doi.org/10.1057/s41599-019-0228-7

Lê, S., Josse, J., & Husson, F. (2008). FactoMineR: An R Package for Multivariate Analysis. *Journal of Statistical Software*, *25*(1). doi.org/10.18637/jss.v025.i01

Lehmann, S., Skogen, J. C., Sandal, G. M., Haug, E., & Bjørknes, R. (2022). Emerging mental health problems during the COVID-19 pandemic among presumably resilient youth -a 9-month follow-up. *BMC Psychiatry*, *22*(1). doi.org/10.1186/s12888-021-03650-z

Manica, M., Guzzetta, G., Riccardo, F., Valenti, A., Poletti, P., Marziano, V., Trentini, F., Andrianou, X., Mateo-Urdiales, A., Del Manso, M., Fabiani, M., Vescio, M. F., Spuri, M., Petrone, D., Bella, A., Iavicoli, S., Ajelli, M., Brusaferro, S., Pezzotti, P., & Merler, S. (2021). Impact of tiered restrictions on human activities and the epidemiology of the second wave of COVID-19 in Italy. *Nature Communications*, *12*(1). doi.org/10.1038/s41467-021-24832-z

Marinaci, T., Venuleo, C., & Savarese, G. (2021). The COVID-19 pandemic from the health workers' perspective: Between health emergency and personal crisis. *Human Arenas*. Advance online publication. https://doi.org/10.1007/s42087-021-00232-z

Marsico, G. (2018). The Challenges of the Schooling from Cultural Psychology of Education. *Integrative Psychological and Behavioral Science*, *52*(3), 474–489. doi.org/10.1007/s12124-018-9454-6

Mayfield, D., McLeod, G., & Hall, P. (1974). The CAGE questionnaire: Validation of a new alcoholism screening instrument. *The American Journal of Psychiatry*, *131*(10), 1121–1123. doi.org/10.1176/ajp.131.10.1121

Mazzuca, C., Falcinelli, I., Michalland, A.-H., Tummolini, L., & Borghi, A. M. (2021). Differences and similarities in the conceptualization of COVID-19 and other diseases in the first Italian lockdown. *Scientific Reports*, *11*(1). doi.org/10.1038/s41598-021-97805-3

Monaghesh, E., & Hajizadeh, A. (2020). The role of telehealth during COVID-19 outbreak: a systematic review based on current evidence. *BMC Public Health*, *20*(1), 1193. doi.org/10.1186/s12889-020-09301-4

Morgan, O. W., Aguilera, X., Ammon, A., Amuasi, J., Fall, I. S., Frieden, T., Heymann, D., Ihekweazu, C., Jeong, E., Leung, G. M., Mahon, B., Nkengasong, J., Qamar, F. N., Schuchat, A., Wieler, L. H., & Dowell, S. F. (2021). Disease surveillance for the COVID-19 era: Time for bold changes. *The Lancet*. Advance online publication. doi.org/10.1016/S0140-6736(21)01096-5

Morina, N., Kip, A., Hoppen, T. H., Priebe, S., & Meyer, T. (2021). Potential impact of physical distancing on physical and mental health: A rapid narrative umbrella review of meta-analyses on the link between social connection and health. *BMJ Open*, *11*(3), e042335. doi.org/10.1136/bmjopen-2020-042335

Nikoloski, Z., Alqunaibet, A. M., Alfawaz, R. A., Almudarra, S. S., Herbst, C. H., El-Saharty, S., Alsukait, R., & Algwizani, A. (2021). Covid-19 and non-communicable diseases: evidence from a systematic literature review. *BMC Public Health*, *21*(1). doi.org/10.1186/s12889-021-11116-w

Orben, A., Tomova, L., & Blakemore, S.-J. (2020). The effects of social deprivation on adolescent development and mental health. *The Lancet Child & Adolescent Health*, *4*(8), 634–640. doi.org/10.1016/S2352-4642(20)30186-3

Padmanabhan, S. (2021). The Coronavirus Disease 2019 (COVID-19) Pan-Syndemic—Will We Ever Learn? *Clinical Infectious Diseases*, *73*(9), e2976-e2977. doi.org/10.1093/cid/ciaa1797

Pezzuti, L., Figus, M., & Lauriola, M. (2021). Effect of COVID-19 pandemic on older adults' emotion regulation and quality of life after lockdown in Italy. Advance online publication. https://doi.org/10.13133/2724-2943/17525 (7-14 Pages / Psychology Hub, Vol. 38 No. 2 (2021)).

Pietromonaco, P. R., & Overall, N. C. (2021). Applying relationship science to evaluate how the COVID-19 pandemic may impact couples' relationships. *American Psychologist*, *76*(3), 438–450. doi.org/10.1037/amp0000714

Power, E., Hughes, S., Cotter, D., & Cannon, M. (2020). Youth mental health in the time of COVID-19. *Irish Journal of Psychological Medicine*, *37*(4), 301–305. doi.org/10.1017/ipm.2020.84

R Core Team (2020). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing. Vienna, Austria. https://www.R-project.org/

Raistrick, D., Tober, G., Heather, N., & Clark, J. A. (2007). Validation of the Social Satisfaction Questionnaire for outcome

evaluation in substance use disorders. *Psychiatric Bulletin*, *31*(9), 333–336. doi.org/10.1192/pb.bp.106.014258

Raistrick, D., Tober, G., Sweetman, J., Unsworth, S., Crosby, H., & Evans, T. (2014). Measuring clinically significant outcomes - LDQ, CORE-10 and SSQ as dimension measures of addiction. *Psychiatric Bulletin* (2014), *38*(3), 112–115. doi.org/10.1192/pb.bp.112.041301

Salton, G., & Buckley, C. (1988). Term-weighting approaches in automatic text retrieval. *Information Processing & Management*, *24*(5), 513–523. doi.org/10.1016/0306-4573(88)90021-0

Savarese, G., Iannaccone, A., Mollo, M., Fasano, O., Pecoraro, N., Carpinelli, L., & Cavallo, P. (2019). Academic performance-related stress levels and reflective awareness: the role of the elicitation approach in an Italian University's psychological counselling. *British Journal of Guidance & Counselling*, *47*(5), 569–578. doi.org/10.1080/03069885.2019.1600188

Scafato, E., Gandin, C., Martire, S., Ghirini, S., Galluzzo, L., e il gruppo di lavoro BISTAIRS (2016). Identificazione precoce e intervento breve nel trattamento dei disordini alcol-correlati: raccomandazioni e linee guida del progetto europeo BISTAIRS. Istituto Superiore di Sanità. Rapporti ISTISAN 16/5

Schön, U.-K., Denhov, A., & Topor, A. (2009). Social Relationships as a Decisive Factor in Recovering From Severe Mental Illness. *International Journal of Social Psychiatry*, *55*(4), 336–347. doi.org/10.1177/0020764008093686

Schwartz, K. D., Exner-Cortens, D., McMorris, C. A., Makarenko, E., Arnold, P., Van Bavel, M., Williams, S., & Canfield, R. (2021). COVID-19 and Student Well-Being: Stress and Mental Health during Return-to-School. *Canadian Journal of School Psychology*, *36*(2), 166-185. doi.org/10.1177/08295735211001653

Smith, T. M. F. (1991), Post-Stratification. *Journal of the Royal Statistical Society: Series D (The Statistician)*, *40*(3), 315-323. doi.org/10.2307/2348284

Tambelli, R., Forte, G., Favieri, F., & Casagrande, M. (2021). Effects of the Coronavirus pandemic on mental health: A possible model of the direct and indirect impact of the pandemic on PTSD symptomatology COVID-19 related. (https://doi.org/10.13133/2724-2943/17527 (23-30 Pages / Psychology Hub, Vol. 38 No. 2 (2021)).

Teach, S. J., & St. Geme, J. W. (2021). The indirect effects of COVID-19 on pediatric research. *Pediatric Research*, *90*(2), 246–247. doi.org/10.1038/s41390-021-01563-x

Tommasi, M., Toro, F., Arnò, S., Carrieri, A., Conte, M. M., Devastato, M. D., Picconi, L., Sergi, M. R., & Saggino, A. (2020). Physical and Psychological Impact of the Phase One Lockdown for COVID-19 on Italians. *Frontiers in Psychology*, *11*, Article 563722. doi.org/10.3389/fpsyg.2020.563722

Valsiner, J., Marsico, G., Chaudhary, N., Sato, T. & Dazzani, V., (Eds) (2016). *Psychology as a Science of Human Being: The Yokohama Manifesto*, Annals of Theoretical Psychology, *13*, Geneve, Switzerland: Springer

van Bavel, J. J., Baicker, K., Boggio, P. S., Capraro, V., Cichocka, A., Cikara, M., Crockett, M. J., Crum, A. J., Douglas, K. M., Druckman, J. N., Drury, J., Dube, O., Ellemers, N., Finkel, E. J., Fowler, J. H., Gelfand, M., Han, S., Haslam, S. A., Jetten, J.,,. Willer, R. (2020). Using social and behavioural

science to support COVID-19 pandemic response. *Nature Human Behaviour*, *4*(5), 460–471. doi.org/10.1038/s41562-020-0884-z

Wang, M.-T., Henry, D. A., Scanlon, C. L., Del Toro, J., & Voltin, S. E. (2022). Adolescent Psychosocial Adjustment during COVID-19: An Intensive Longitudinal Study. *Journal of Clinical Child & Adolescent Psychology*, 1–16. doi.org/10.1080/15374416.2021.2007487

Williamson, B., Macgilchrist, F., & Potter, J. (2021). Covid-19 controversies and critical research in digital education. *Learning, Media and Technology*, *46*(2), 117-127. doi.org/10.1080/17439884.2021.1922437

## Supporting information

### Participants

A total of 29 duplicates were detected and responses acknowledged as the result of an online system overloading, whereby the number of respondents exceeded a system capacity to acquire multiple responses at once. The entire online form was not accessible to participants beginning April 23, 2021.

### Data analysis

First, a self-selection bias was addressed by comparing sampling quota from a set of demographic variables and matching the corresponding values observed in the population of university students enrolled at the Department of Human, Philosophical, and Educational Sciences.

The sampling units were weighted according to the post-stratification scores. The latter were computed to balance a sampling bias with respect to the population quota (Table I). In order to demonstrate the application of the weighting procedure, the post-stratification weighting scheme for younger women is shown below:

$$942/4327 = x/333 \qquad \text{if } x=72, \text{ score is } 72/156 = 0.46$$

Based on the above equation, younger women individually accounted for a weight of 0.46. Similar calculations generated a weighted value of 1.34 for older women, 1.99 for younger men, and 1.75 for older men.

Response values from item Q1 were grouped in two single categories (Smoking vs. Non-Smoking). Questionnaire items from Q2 to Q5 were encoded separately in either "Never to Sometimes" or "Most of the Time to Always" categories. Functional areas of the AUDIT-C (Q6 to Q8), CAGE (Q9 to Q12), and Social Satisfaction Questionnaire (SSQ; Q13 to Q20) were computed independently. The Q8 item was used to assess problem drinking, with "Never" responses resulting in placement in a "Negative" category and the remaining response values being placed in a "Problem Drinking" category. Items from Q9 to Q12 were considered either "Negative" with all "No" response values, or "Positive" with one or more "Yes" response values. Response values from SSQ items Q13 to Q20 were scored and grouped in either clinical (< 16) or non-clinical (> = 16) categories. Nearly one in four participants answered the Q7 item (24.3%).

### Multiple Correspondence Analysis on SSQ and CAGE

The data set contained 333 observations and three (CAGE: Q9 to Q11) plus eight (SSQ: Q13 to Q20) variables with a total of thirty-eight levels (3x2+8x4=38). The variable CAGE4 (Q12) was considered inactive and projected as a supplementary variable in the MCA because of rare observations from the level "EyeOpener_Yes".

In Figure 1, low contribution to the inertia of the first factorial plane (18.80%) was shown for CAGE variables. However, it is common that points close to the plot origin represent common modalities (i.e., response categories) with a lower capacity for discriminating among observations. In accordance with Figure 1, the most important variables were SSQ8 (Q20), SSQ2 (Q14), SSQ1 (Q13), SSQ4 (Q16), and SSQ7 (Q19).

In Figure 2, response categories are represented on the MCA factorial plane. Each variable was used to discriminate answers resulting in the classic horseshoe effect. On the top left portion of the plot, the "Satisfied" categories for SSQ6, SSQ5, SSQ4, and SSQ3 variables are presented. The most common answers are shown when moving toward the plot origin. In particular, the modalities "No" for all CAGE variables and the "Unsatisfied" and "Very Unsatisfied" responses for variable SSQ5 were close to the plot origin. At the bottom of the plot, middle categories of "Somewhat Satisfied" for SSQ1, SSQ2, SSQ7, and SSQ8 are shown. At the top right area of the plot, the "Unsatisfied" and "Very Unsatisfied" responses are drawn along with the modalities "Yes" for CAGE1, CAGE2, and CAGE3.

**Tab. 1**. Original Frequency Table and Weighted Frequency Table

| Observed sample | ≤22 y/o | >22 y/o | Total | Population | ≤22 y/o | >22 y/o | Total | Weighted Sample[a] | ≤22 y/o | >22 y/o | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Female | 156 | 135 | 291 | Female | 942 | 2351 | 3293 | Female | 72 | 181 | 253 |
| | | | | | | | | Weight | 0.46 | 1.34 | |
| Male | 26 | 16 | 42 | Male | 671 | 363 | 1034 | Male | 52 | 28 | 80 |
| | | | | | | | | Weight | 1.99 | 1.75 | |
| Total | 182 | 151 | 333 | Total | 1613 | 2714 | 4327 | Total | 124 | 209 | 333 |

*Note.* a. The weighted sample estimates the corresponding quota observed from the population data for Sex and Age by applying the procedure of the post-stratification scores.

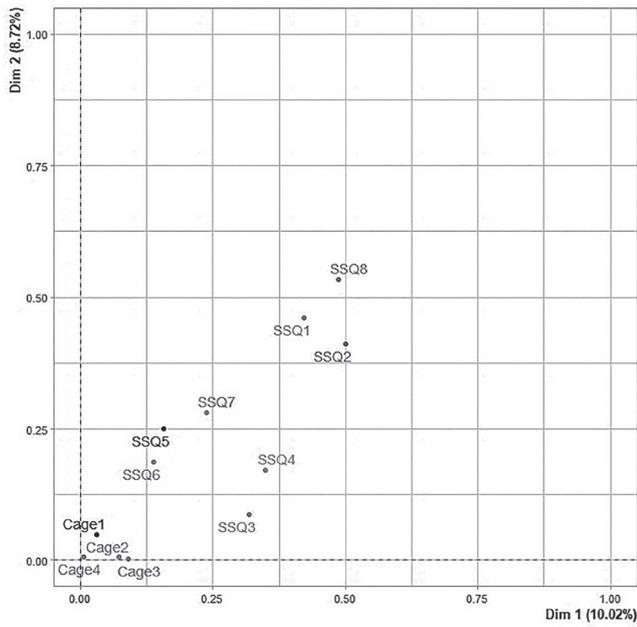**Fig. 1**. Plot Representation of Variables on the First Factorial Plan



**Fig. 2**. MCA Map of the Response Categories on the First Factorial Plane



| Attribute-Levels | Cluster 1 | Cluster 2 | Cluster 3 |
|---|---|---|---|
| Cage3=Guilty_Yes | -2.73 | 0.33 | 2.47 |
| SSQ1_Satisfied | 11.10 | -6.42 | -5.74 |
| SSQ1_Somewhat Satisfied | -7.22 | 8.89 | -3.13 |
| SSQ1_Unsatisfied | -3.60 | 0.07 | 3.48 |
| SSQ1_Very Unsatisfied | -3.22 | -4.55 | 8.18 |
| SSQ2_Satisfied | 11.80 | -6.45 | -5.92 |
| SSQ2_Somewhat Satisfied | -8.63 | 9.23 | -2.16 |
| SSQ2_Unsatisfied | -3.01 | -0.23 | 3.28 |
| SSQ2_Very Unsatisfied | -3.50 | -3.81 | 7.73 |
| SSQ3_Satisfied | 6.09 | -4.65 | -1.76 |
| SSQ3_Unsatisfied | -3.88 | 4.08 | -0.77 |
| SSQ3_Very Unsatisfied | -3.46 | -1.10 | 4.85 |
| SSQ4_Satisfied | 6.18 | -5.75 | -0.30 |
| SSQ4_Unsatisfied | -5.26 | 6.22 | -2.09 |
| SSQ4_Very Unsatisfied | -4.61 | -1.08 | 5.49 |
| SSQ5_Satisfied | 3.73 | -4.74 | 1.00 |
| SSQ5_Somewhat Satisfied | 3.43 | -5.16 | 2.35 |
| SSQ5_Unsatisfied | -0.85 | 2.52 | -2.40 |
| SSQ5_Very Unsatisfied | -3.68 | 3.25 | 0.12 |
| SSQ6_Satisfied | 2.77 | -3.30 | 0.78 |
| SSQ6_Somewhat Satisfied | 5.03 | -5.45 | 0.82 |
| SSQ6_Very Unsatisfied | -4.34 | 4.23 | -0.46 |
| SSQ7_Satisfied | 6.62 | -3.84 | -3.04 |
| SSQ7_Somewhat Satisfied | -5.19 | 7.36 | -3.75 |
| SSQ7_Unsatisfied | -0.37 | -1.44 | 2.29 |
| SSQ7_Very Unsatisfied | -2.90 | -3.28 | 6.68 |
| SSQ8_Satisfied | 10.4 | -6.35 | -4.25 |
| SSQ8_Somewhat Satisfied | -6.87 | 8.98 | -3.80 |
| SSQ8_Unsatisfied | -3.41 | 1.71 | 1.44 |
| SSQ8_Very Unsatisfied | -4.09 | -6.41 | 10.50 |

Based on the MCA results, we carried out the Cluster Analysis through Ward's criterion. Three main groups of respondents were clustered from the available response categories (Table II); Cluster 1: The Satisfied; Cluster 2: The Somewhat Satisfied; and Cluster 3: The Unsatisfied and the "CAGER" (CutDown_Yes, Annoyed, Yes, Guilty_Yes).

**Tab. 2**. Characterization of the Clusters by Response Categories

| Attribute-Levels | Cluster 1 | Cluster 2 | Cluster 3 |
|---|---|---|---|
| Cage1=CutDown_No | 1.45 | 1.27 | -3.23 |
| Cage1=CutDown_Yes | -1.45 | -1.27 | 3.23 |
| Cage2=Annoyed_No | 3.28 | 0.75 | -4.28 |
| Cage2=Annoyed_Yes | -3.28 | -0.75 | 4.28 |
| Cage3=Guilty_No | 2.73 | -0.33 | -2.47 |

*Correspondence Analysis of Lexical Tables*

The main purpose of applying CA to a lexical table is to highlight the latent structure underlying the text. The CA procedure involves dimensionality reduction of the linguistic variables or documents, namely, the responses we collected from the open-ended question.

*Data 1*

The first data set is the lexical table holding the scores for the 160 lemmas used by respondents aggregated in six categories: "Engaged", "Not Engaged", Female < = 22, Female > 22, Male < = 22, and Male > 22 (Figure 3).

**Fig. 3**. Factorial Map of Lexical Correspondence Analysis on Sex, Age, and Relationship Status
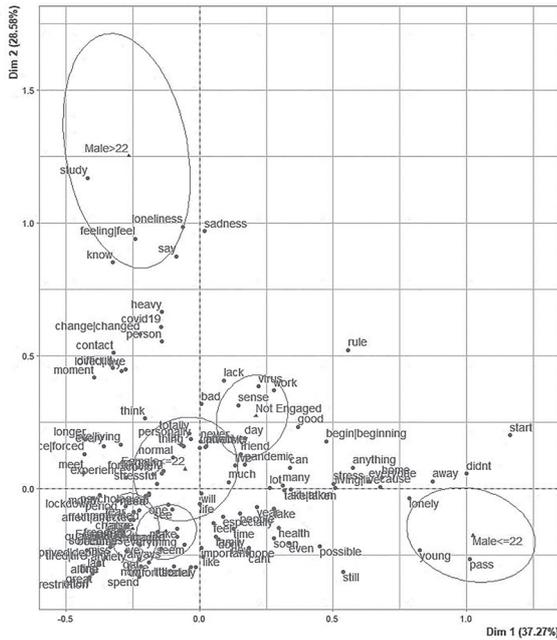


The words *young*, *lonely*, *away*, *pass*, *stress*, *home*, and *start*, and the group Male < = 22, are highly correlated with the first dimension. These words could therefore summarize Dimension 1. Dimension 2 opposes words such as *study*, *feeling*, *loneliness*, *know*, and *sadness* (to the top of the graph, characterized by a strongly positive coordinate on the axis and related to Male > 22) to words characterized by a strongly negative coordinate on the axis such as *stressful*, *fear*, *miss*, *anxiety*, and *deprived* related to Female and "Engaged" participants.

### Data 2

The second data set holds the scores of the 160 lemmas aggregated according to the four satisfaction levels of the SSQ2 item (Figure 4). Dimension 1 opposes words such as *need*, *everything*, *try*, *take*, and *anything*, and less close: *stress*, *pandemic*, and *restriction* (to the right of the graph, characterized by a strongly positive coordinate on the axis) associated with the "Very Unsatisfied" level, to words such

Fig. 4. Factorial Map of Lexical Correspondence Analysis on SSQ2 (Q14)
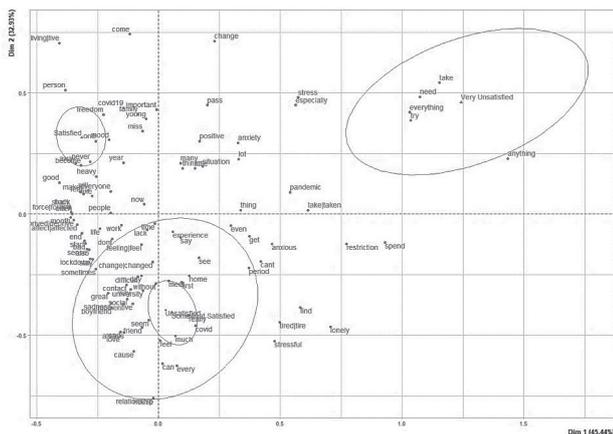


as *family*, *freedom*, *person*, *important*, *family*, *young*, *and good* (to the left of the graph) associated with the "Satisfied" level. "Unsatisfied" and "Somewhat Satisfied", which are the middle items on the scale, are related to people sharing a common language characterized by lemmas with negative coordinates on the second dimension.

### Data 3

The third data set holds the scores of the 160 lemmas aggregated according to the four satisfaction levels of the SSQ7 item (Figure 5). The first dimension opposes words such as *feeling*, *virus*, *loneliness*, *home*, *work*, and *tired* (to the right of the graph) to words characterized by a negative coordinate on the axis (to the left of the graph). The second dimension opposes the factors "Somewhat Satisfied" and "Satisfied" (on the bottom side, very close to the origin) related to commonly used words to the "Unsatisfied" factor (on the top side) related to words such as *house*, *affect*, *away*, *sadness*, *try*, *good*, and *take*.

**Fig. 5**. Factorial Map of Lexical Correspondence Analysis on SSQ7 (Q19)
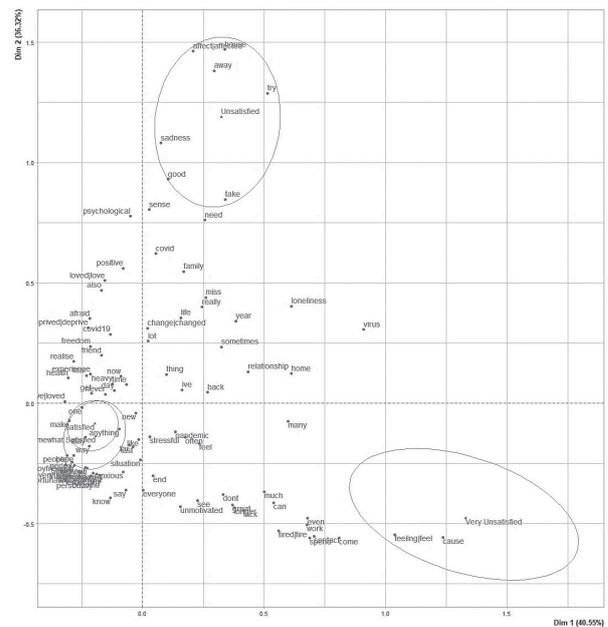


### Data 4

The fourth data set holds the scores of the 160 lemmas aggregated according to the four satisfaction levels of the SSQ8 item (Figure 6).

Here it appears that most of the language used expresses a feeling consistent with "Very Unsatisfied". Words characterizing the unsatisfied groups included *stressful*, *sad*, *lack*, *restriction*, *pandemic*, *(without) contact*, *period*, *loneliness*, and *lockdown*. On the left side, the "Satisfied" group uses encouraging connotations regarding COVID-19 such as *good*, *positive*, *hope*, and *love*.

**Fig. 6**. Factorial Map of Lexical Correspondence Analysis on SSQ8 (Q20)