Prosocial behaviours under collective quarantine conditions. A latent class analysis study during the 2020 COVID-19 lockdown in Italy

(Article begins on next page)

26 April 2024

Abstract

Aim. To identify patterns of prosocial behaviours under collective quarantine conditions.

Method. Survey data was collected from a sample of Italian adults during the March−May 2020 COVID-19 lockdown in Italy. Participants reported on offline and online prosocial behaviours, Sense of Community Responsibility (SoC-R) and perceptions of community resilience. Latent class analysis (LCA) was used for data analysis.

Results. A total of 4,045 participants completed the survey and 2,562 were eligible (72% female; mean age 38.7 years). LCA revealed four classes of prosocial behaviours: *Money donors* (7%), *Online & offline helpers* (59%), *Online health information sharers* (21%), and *Neighbour helpers* (13%). The classes were partially invariant across age groups (18−35 and > 35 years). Being a man and higher SoC-R scores were associated with belonging to the *Online & offline helper* class. Members of this class also reported the greatest perceptions of community resilience.

Conclusions. Results offer insight on the multidimensionality of prosociality under collective quarantine conditions. *Online & offline helpers* could be targeted for promoting sustained altruism and involvement in community organisations. For the other groups, programmes should aim to eliminate barriers to help others in multiple ways.

Keywords: Prosocial behaviours; COVID-19; Lockdown; Community; Person-centred approach.

Introduction

The expression "catastrophe compassion" was used to describe how people react to large-scale disasters by engaging in altruistic behaviour (Zaki, 2020). Scholars suggested that these forms of prosociality during collective tragic events arise from shared social identities and emotional connection with other people who are facing the same hardships (Drury, 2018; Zaki, 2020).

In the first months of 2020, the world was hit by the SARS-CoV-2 pandemic and countries all over the world imposed quarantine measures to reduce the spread of the virus. First in Europe, Italy imposed a strict lockdown starting on the 8th of March that was partially eased on the 4th of May. These measures proved effective against the spread of the virus, but caused disruption in social and community life (Brooks et al., 2020). Despite the difficulties, millions of people reacted by engaging in a variety of altruistic behaviours, such as volunteering, donating money, and offering online social and emotional support to others (Brooks et al., 2020).

By using data on prosocial behaviours from a large sample of Italian adults, this study will examine the specifics of how prosociality was expressed during the March-May 2020 COVID-19 lockdown when face-to-face activities were strongly limited by restrictions imposed by the authorities.

Prosocial behaviours have been distinguished according to different dimensions (e.g., spontaneous informal vs. planned formal; personal vs. impersonal), as well as the amount of effort required from the helper (Coyne et al., 2018; Padilla-Walker & Carlo, 2014). Low cost behaviours are relatively easy and often one-off actions of helping and kindness, such as sending an uplifting message. High cost behaviours, such as volunteering in emergency situations, require prolonged engagement, moral courage

and may be against one's own interests (Eisenberg & Spinrad, 2014; Niesta Kayser, Greitemeyer, Fischer, & Frey, 2010).

     Results of research offer insight into the likelihood and motivations of prosocial behaviour in emergency situations (Fischer, Greitemeyer, Pollozek, & Frey, 2006; Rand & Epstein, 2014; Rodríguez, Trainor, & Quarantelli, 2006), yet little is known in regard to the use of online forms of prosocial behaviour during sanitary crises (e.g., Palen, Hiltz, & Liu, 2007), and whether they coexist with offline behaviours. Online and offline altruistic conducts share fundamental characteristics and beneficial consequences for the receiver, the giver and the community overall (Sproull, Conley, & Moon, 2013; Wright & Pendergrass, 2016). The internet and social networks provide additional opportunities for people to help, especially those who are confined due to geographical or other resource limitations; they can provide means for sharing information, virtual communication and learning from others' personal experience and knowledge in preparation for future events (Palen et al., 2007). This may be of particular importance when collective quarantine measures are enforced and action is mostly confined to the digital sphere. Some have indeed suggested that digital platforms played a key role in mitigating the effects of the COVID-19 pandemic (Miao, Schwarz, & Schwarz, 2021).

     Research on the multidimensionality of prosocial behaviour stresses the importance of considering different types of behaviour simultaneously. This can be achieved using the person-centred approach (i.e., latent class analysis) which relaxes *"the assumption that all individuals are drawn from a single population, and consider the possibility that the sample might include multiple subpopulations characterized by different sets of parameters"* (Morin, Bujacz, & Gagné, 2018, p. 805). This results in a classification system that groups individuals into distinct profiles or classes.

Predictors of prosocial behaviours under emergency conditions

Little is known as to whether patterns of prosocial behaviours during emergencies and collective quarantine may differ across gender and age groups. Concerning gender, men may be more active during emergencies because they generally engage more than women in prosocial behaviour that involves real or perceived physical risk and their behaviours are more agentic and collectively oriented than women's (Eagly, 2009; Espinosa & Kovářík, 2015). In terms of age differences, prosocial behaviours are lowest during young adulthood because of the instability in life and relationships, a greater focalisation on oneself and one's educational and work goals, and increase as individuals achieve a more stable role in society in later adulthood and old age, greater empathy and the adoption of generative goals (Eisenberg, Cumberland, Guthrie, Murphy, & Shepard, 2005; Freund & Blanchard-Fields, 2014). Young people, however, may have already been familiar with the digital world before the COVID-19 health emergency, and therefore have been more prone to help online (Xie et al., 2020).

From a psychosocial perspective, prosocial behaviours have been explained using constructs revolving around helpers' sense of responsibility for others (Yang et al., 2020). At a community level, responsibility towards others has been understood as Sense of Community Responsibility (SoC-R), which refers to the feeling of responsibility towards other community members and the community as a whole, that enhances individuals' motivation to help (Nowell & Boyd, 2010; Nowell & Boyd, 2014).

The relationship between prosociality and community resilience

Research has demonstrated the benefits of prosociality in the face of disasters and emergencies, including during a pandemic (Varma, Chen, Lin, Aknin, & Hu, 2020). Helping others contributes to enhancing helpers' physical and psychological well-being (Curry et al., 2018; Dunn, Whillans, Norton, & Aknin, 2020; Pozzi, Marta, Marzana, Gozzoli, & Ruggieri, 2014), even when beneficiaries are distant and not physically present (Martela & Ryan, 2016). Altruistic behaviours also lead to positive collective outcomes, such as an increase of opportunities for social relationships, solidarity, reciprocal support, and feelings of being a competent individual and community member (Drury, 2018; Vezzali, Drury, Versari, & Cadamuro, 2016). These are critical elements upon which community resilience is built (Heid, Christman, Pruchno, Cartwright, & Wilson-Genderson, 2016; Norris, Stevens, Pfefferbaum, Wyche, & Pfefferbaum, 2008). Therefore, the adoption of prosocial behaviours by community members is also supposed to foster greater perceptions of the community's ability to cope under difficult circumstances (i.e., its resilience or capability to respond to negative collective events and stressors) (Magis, 2010). Community resilience includes different dimensions (Pfefferbaum, Pfefferbaum, Nitiéma, Houston, & Van Horn, 2014), though two are likely to be important outcomes of altruistic behaviours: the first one being community transformative potential (i.e., perception of the ability to analyse and understand collective experiences in order to assess and build community skills to face them); the second being the perception of the community's capacity to cope with disasters (i.e., community readiness and recovery in the face of disasters).

Aims

We used Latent Class Analysis (LCA) to examine data on prosocial behaviours among Italian adults (18–65 years) during the March–May 2020 COVID-19 national lockdown

in Italy. Our study aimed to (a) Identify distinct subgroups (i.e., classes) of individuals based on a set of prosocial behaviours; (b) Examine the consistency of the latent class solution and membership proportions across age groups (18–35 and 36-65 years); (c) Examine whether gender and community sense of responsibility distinguish between the classes; and (d) whether differences exist across classes in perceptions of community resilience.

Because there is no research using LCA on patterns of prosocial behaviours during emergencies, we found it difficult to make specific hypotheses. However, we did expect young adults to belong to profiles that were more active online, but adults over 35 years to engage in a greater variety of altruistic behaviours, both online and offline. In regard to our third and fourth research question, we expected that being a man and having a greater sense of responsibility towards their community would be associated with belonging to profile(s) that are characterised by greater involvement in a variety of − including high cost − prosocial behaviours. This latter profile(s) should also display greater perceptions of community resilience.

Methods

Study design

This study was the result of a collaborative effort by five Italian universities: the [blinded for review]. Each university research team recruited participants through direct contact in their respective geographic area. Participants from all ages, except for people under the age of 18, were emailed a link to a survey. Respondents did not receive any incentive for their participation. Data was collected between the 12th of April and the 21st of May 2020. Ethical approval was obtained from the Human Research Ethics

Committee at the [blinded for review] for all aspects of the current research. All participants provided informed consent for taking part in the study.

Measures

The survey included data on age, gender, occupation, and region of residence, and measures of prosocial behaviours, sense of community responsibility and community resilience.

Prosocial behaviours. Eight dichotomous (No = 0, Yes =1) items assessing engagement in a variety of online and offline behaviours were adapted from existing scales to the specifics of the lockdown ([Enchikova et al., 2019](#); [Rushton, Chrisjohn, & Fekken, 1981](#)). Respondents were asked to answer the question "*Since the beginning of the COVID-19 emergency, have you engaged in any of the following behaviours?*". The items were: *"I have worked in a volunteer association for practical help, such as transport, delivery of drugs"* (Volunteered); *"I have donated money to a hospital/ health service"* (Donated money); *"I have helped a neighbour"* (Helped a neighbour); *"I have given classes to share my competences (soft skills and professional) with others"* (Shared competencies online); *"I have shared verified and official health advice on social networks"* (Shared health advice online); *"I have offered school services for children/teenagers at home"* (Helped school children online); *"I have posted messages of hope on social networks"* (Created hope content online); *"I have created a sharing platform on the Web"* (Created an online sharing platform). The items represented both low cost (e.g., posting messages of hope online) and high cost (e.g. volunteering for associations), offline personal (e.g., helping neighbours) and online impersonal (e.g., sharing advice online) behaviours.

Sense of community responsibility. We used the Italian version of Sense of
Community Responsibility (SoC-R) scale (Prati et al., 2020). The scale consists of six
items (e.g., "*It is easy for me to put aside my own agenda in favour of the greater good
of my community*"*).* Answers were scored on a five-point Likert scale, ranging from one
(Completely disagree) to five (Completely agree).

Community resilience. We used two subscales of the Community Advancing
Resilience Toolkit (CART) (Pfefferbaum et al., 2014): Transformative Potential (three
items; e.g., "*My community looks at its successes and failures so it can learn from the
past*") and Disaster management (four items; e.g., "*My community can provide
emergency services during a disaster*"). Answers were scored on a five-point Likert
scale, ranging from one (Completely disagree) to five (Completely agree).

Data analysis

Based on the eight dichotomous indicators, sub-groups of individuals characterized by
common patterns of multiple prosocial behaviours were identified using LCA.
Following established recommendations (Lanza, Dziak, Huang, Xu, & Collins, 2011), a
series of statistical models were estimated in the overall sample, followed by
examination of measurement invariance across 18–35 and 36-65 years age groups. For a
description of the statistical (absolute and relative model fit indices) and conceptual
standards used to compare the different profile solutions see Sorgente, Lanz, Serido,
Tagliabue, and Shim (2019). The three-step procedure (Asparouhov & Muthén, 2014)
was used to test the effect on class membership probabilities of gender and SoC-R. In
the final set of analyses, we included the two Transformative potential and Disaster
management CART subscales as outcome variables and estimated their mean for each

of the four latent classes by age group. Analyses were performed in MPlus 7 (Muthén & Muthén, 1998-2015) using the robust maximum likelihood estimator.

Results

Participants

A total of 4,045 participants completed the survey. Those who completed the survey after the national lockdown in Italy was eased on the 4th of May 2020 were excluded (N = 793), as well as those older than 65 (N = 154). Only participants who reported at least one prosocial behaviour were included (N = 2,622). As required in LCA models, questionnaires with missing values on one or more indicators or predictor variables (N = 60) were excluded from analyses, resulting in an analytic sample of 2,562 participants. Slightly more than two-thirds (71.9%, N = 1,842) of participants were female and the mean age was 38.7 years old (*SD* = 12.88; range 18–65). Nearly half of the sample (46.9%, N = 1,201) were 35 years of age or younger, while 53.1% (N = 1,361) were 36 or older. Participants' occupation status was distributed as follows: 16.7% students, 72.1% workers, 8.3% unemployed, and 18.2% retired. In terms of geographic area, 70.3% lived in the North, and 29.7% in the Central and South Italy.

Descriptive statistics

Table 1 displays the proportion of participants who reported each prosocial behaviour, separately by age group, and for the whole sample. Participants over the age of 35 were more likely to report having helped a neighbour, but less likely to have shared verified health information via social networks. No age differences were observed with respect

to the other behaviours. The internal consistency of all scales included as covariates or outcomes was within conventional limits, varying from $\alpha = 0.79$ to $\alpha = 0.89$.

Table 1

Identification of latent classes of prosocial behaviours

We compared models with two to seven latent classes. However, the seven-class model did not converge and was not reported. As seen in Table 2, although each of the relative fit indices (CAIC and ssBIC) decreased with each additional solution, the relative reduction in these values substantially diminished beyond the four-class solution. For example, the difference in aBIC between the three-class solution and the four-class solution was 99.592 (22019.096 – 21919.504) while this difference was only 36.775 (21919.504 – 21882.729) when comparing the four-class and five-class solutions. The other fit indices did not provide clear evidence to support either the four or five-class model, except that the five-class solution exhibited the highest value of cmP, and the four-class model presented a number of standardized residual larger than |3| just above the 5% threshold (Stdres = 5.24%). For these reasons, the five-model solution was examined first. Inspection of item probabilities of this model, however, revealed that latent classes were not clearly distinguished (Table S1). On the other hand, the four-class model classes were relatively distinguishable and interpretable. Thus, this model was deemed the best-fitting, most interpretable and most parsimonious solution to the data. For this model, entropy was above acceptability thresholds (> 0.70).

Table 2

Table 3 presents the results of the selected four-class model. The numbers below each subgroup heading (item response probabilities) represent the likelihood that the participants in each particular latent class reported exhibiting a specific prosocial behaviour. About 7% of the sample belonged to the "*Money donor*" class, defined by very low probabilities of reporting any of the prosocial behaviours except donating money to a hospital or healthcare provider. Response probability to this indicator was 1.00, reflecting certainty of this behaviour. In contrast, "*Online & offline helpers*" (59.1% of the sample) were likely to report a variety of both offline (e.g., helping a neighbour) and online (e.g., sharing verified information via social networks) prosocial behaviours, though none were dominant or reflected high certainty (the greatest being 0.54). Interestingly, among all classes, members of this class showed the greatest probability of having been actively engaged in a volunteer organisation providing practical help during the lockdown. About 20% of the sample was classified as *"Online health information sharers",* who were distinguished by elevated probabilities of sharing verified health information via social networks. "*Neighbour helpers*" (13% of the sample) were characterized by high probabilities of helping neighbours only.

Table 3

Assessing invariance of item response probabilities across age groups.

As shown in Table 4, the full invariant model (in which all parameters were kept equal across age groups) was statistically different from the baseline model, that is, the model in which all parameters were free to vary ($p < .001$). Therefore, it was not possible to

11

assume full measurement invariance. We had to free (i.e., let them vary across age groups) eleven parameters before obtaining a model statistically equal to the baseline (*p* > .05). Parameters were let free one at a time starting from the greatest deviation in absolute value between the baseline and the full invariance models. The majority of the *Online & offline helper* class' item-response probabilities (indicators were: Helped a neighbour, Shared competencies online, Shared health advice online, Helped school children online, Created hope content online, Created an online sharing platform) were free to differ across the two groups. All free parameters, except one (Helped school children online), showed an increased probability among older adults as compared to young adults. Despite the differences in those eleven parameters, the interpretation of the *Online & offline helpers* and the other classes remained broadly the same across age groups. The item-response probability plots of the partial invariant solution are reported in Figure 1.

Table 4

Figure 1

Predictors of latent class membership

Gender and SoC-R were included in the model to test their impact on class membership, separately by age group (Table 5). The *Online & offline helper* class was selected as the reference category. The associations between latent class membership and the covariates show that men were about 40 to 50% less likely to belong to any class compared to the *Online & offline helpers* (OR range 0.34−0.59), except for the *Neighbour helper* class among adults over 35 years. Similarly, lower SoC-R scores

were related to increased probabilities of being a member of any class in both samples compared to the *Online & offline helper* class.

Associations between latent classes and perceptions of community resilience

Estimated means of the two community resilience outcome variables for each of the four latent classes are displayed in Table 3. The overall test of significance of differences among the classes using the Wald test was significant for the Transformative potential ($\chi^2 = 51.737$, $p < 0.001$) and Disaster management CART subscales ($\chi^2 = 13.626$, $p < 0.01$). Results of pairwise comparisons are reported in the supplemental Table S2. In regard to perceptions of community Transformative potential, members of the *Online & offline helper* class reported greater scores than any other class, and *Money donors* and *Neighbour helpers* reported greater scores compared to *Online health information sharers*. Members of the latter class reported lower perceptions of community Disaster management than any other group.

Discussion

This study used the person-centred approach to examine patterns of prosocial behaviours exhibited by Italians during the March–May 2020 COVID-19 lockdown. Results offer insight on how prosociality is expressed under collective quarantine conditions when face-to-face activities are strongly limited.

Four classes which featured different patterns of behaviours were identified. Three profiles representing 40% of the adult population were characterised by a single dominant behaviour (i.e., donating money, sharing verified health information online or helping a neighbour), whereas one group (i.e., *Online & offline helpers*) engaged in a

variety of online and offline, low and high cost altruistic conducts. Results demonstrate that a considerable proportion of people engaged in a single exclusive behaviour, but the majority expressed their prosociality in multiple ways. These results reflect the multidimensionality of the altruistic conduct, which includes helping, sharing, comforting, guiding, rescuing, but also the degrees of effort involved in such conducts (Eagly, 2009; Marzana, Marta, & Pozzi, 2012; Penner, Dovidio, Piliavin, & Schroeder, 2005). Donating money or sharing information online require a limited amount of effort and commitment (Sproull et al., 2013). For this reason, *Online & offline helpers* appear to be the most prosocial profile: individuals belonging to this class have engaged in various altruistic behaviours, some of which required a high level of personal effort and involvement.

Multigroup analyses demonstrated that the same (or very similar) behavioural patterns can be found in all age groups. Contrary to our expectations, we did not find young adults to be more active online than older adults. It is possible that older adults were forced by the circumstances to become rapidly familiar with online services (Xie et al., 2020). In addition, even though the *Online & offline helper* class looked the same across age groups, people over 35 years were more likely than young adults to engage in most prosocial behaviours we measured. This result is likely to reflect older adults' greater disposition to help others particularly when the context is socioemotionally relevant as it is during emergencies (Eisenberg & Spinrad, 2014; Padilla-Walker, Memmott-Elison, & Nielson, 2018; Wray-Lake, Schulenberg, Keyes, & Shubert, 2017). It is also possible that, under such exceptional circumstances, older adults felt more competent or have been deemed more competent by others, and therefore put themselves into play more than young adults (Beadle, Sheehan, Dahlben, & Gutchess,

2015). Further investigations are necessary to better understand age-related prosocial behaviour under collective quarantine conditions.

The analyses demonstrated that being a man and reporting higher SoC-R scores were associated with belonging to the *Online & offline helper* class. This result is consistent with those of previous studies revealing the gendered nature of prosociality. Women have a propensity for more relational prosocial behaviour and for bonding with others in close and dyadic relationships (e.g., helping a neighbour). Conversely, men are likely to intervene under emergency circumstances when real or perceived physical risks are involved, and their action is more collectively oriented (Eagly, 2009; Espinosa & Kovářík, 2015). As expected, a greater sense of community responsibility was associated with engaging in a variety of altruistic behaviours (i.e., *Online & offline helpers*) to benefit the wider social and community context, compared to one-off behaviours such as donating money. This is consistent with results of research indicating there is a positive relationship between community responsibility and community engagement (Prati et al., 2020; Procentese, Gatti, & Falanga, 2019).

Consistent with our expectations, *Online & offline helpers* perceived their community as more capable to cope with the emergency and reported the greatest perceptions of community Transformative potential resilience. We speculate this reflects their expectations that community members are in turn more prone to help others as they do (Procentese, De Carlo, & Gatti, 2019). Conversely, limiting their action to a single behaviour with little interaction with other community members, *Online health information sharers* felt their community was less resilient. These findings are in accordance with Jetten, Reicher, Haslam, and Cruwys (2020), who

pointed out that "*resilience [...] arises when people come together as a group, when they come to see others as a source of support*" (p. 9).

Several limitations of the current study suggest avenues for future research. First, the cross-sectional design constrains the interpretation of causal effects. Further longitudinal and mixed-method research is needed to better examine causal relationships and get a deeper understanding of these issues (Aresi, Henderson, Hall-Campbell, & Ogley-Oliver, 2017). A second limitation is that the present study employed only self-report measures, which might be susceptible to response bias. Third, our analyses are not based on a representative sample. Future studies with other samples in Italy and other countries are needed to generalize these findings.

Conclusions and implications for research and practice

The current study contributes to the literature by providing a typology of prosocial behaviours under collective quarantine conditions. Our findings can inform targeted interventions and communication campaigns to foster spontaneous altruism during foreseeable similar circumstances in the future. While it is beyond the scope of this study to critique whether some patterns of prosocial behaviours are preferred over others, programmes might be developed to eliminate barriers that hinder individuals from helping others in multiple ways. In order to create custom strategies for specific groups, future studies should investigate what factors explain why some individuals limit their action to a single gesture and encourage them to adopt a broader approach. Individuals can then be motivated to commit their time to provide practical and emotional support to others, thus generating a virtuous cycle pattern of reciprocity that can continue beyond the time of the health emergency (Erreygers, Vandebosch, Vranjes,

Baillien, & De Witte, 2018). Results also indicate that individuals who engaged in a variety of online and offline prosocial behaviours displayed a greater, but still low, chance of working as volunteers. Community organisations may target this subgroup to recruit new people for the time of the emergency. In this regard, the literature on episodic volunteering may offer insight on how to best recruit and motivate volunteers under such specific circumstances (Pozzi, Meneghini, & Marta, 2019).

From a public health perspective, community engagement proved critical to contain epidemics in the past (Laverack & Manoncourt, 2015). Stakeholders and policy-makers should consider the relevance of the direct involvement of community organisations and citizens as "lay actors" of prosocial actions that can contribute to supporting people navigate through the harshness of the emergency, and can be a valuable aid to public services. Finally, we suggest that our study makes an important methodological contribution to the field of prosocial behaviours. Our use of LCA allowed developing a multifaceted and thorough portrait of these behaviours during health emergencies. We recommend LCA as an important tool for future studies in this field.

References

Aresi, G., Henderson, D. X., Hall-Campbell, N. F., & Ogley-Oliver, E. J. F. (2017). Practicing Community Psychology Through Mixed Methods Participatory Research Designs. *World Futures, 73*(7), 473-490. doi:10.1080/02604027.2017.1357936

Asparouhov, T., & Muthén, B. O. (2014). Auxiliary variables in mixture modeling: Three-step approaches using Mplus. *Structural Equation Modeling: A Multidisciplinary Journal, 21*(3), 329-341. doi:10.1080/10705511.2014.915181

Beadle, J. N., Sheehan, A. H., Dahlben, B., & Gutchess, A. H. (2015). Aging, empathy, and prosociality. *The journals of gerontology. Series B, Psychological sciences and social sciences, 70*(2), 215-224. doi:10.1093/geronb/gbt091

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. doi:10.1016/S0140-6736(20)30460-8

Coyne, S. M., Padilla-Walker, L. M., Holmgren, H. G., Davis, E. J., Collier, K. M., Memmott-Elison, M. K., & Hawkins, A. J. (2018). A meta-analysis of prosocial media on prosocial behavior, aggression, and empathic concern: A multidimensional approach. *Developmental Psychology, 54*(2), 331-347. doi:10.1037/dev0000412

Curry, O. S., Rowland, L. A., Van Lissa, C. J., Zlotowitz, S., McAlaney, J., & Whitehouse, H. (2018). Happy to help? A systematic review and meta-analysis of the effects of performing acts of kindness on the well-being of the actor. *Journal of Experimental Social Psychology, 76*, 320-329. doi:10.1016/j.jesp.2018.02.014

Drury, J. (2018). The role of social identity processes in mass emergency behaviour: An integrative review. *European Review of Social Psychology, 29*(1), 38-81. doi:10.1080/10463283.2018.1471948

Dunn, E. W., Whillans, A. V., Norton, M. I., & Aknin, L. B. (2020). Chapter Two - Prosocial spending and buying time: Money as a tool for increasing subjective well-being. In B. Gawronski (Ed.), *Advances in Experimental Social Psychology* (Vol. 61, pp. 67-126). Cambridge, USA: Academic Press.

Eagly, A. H. (2009). The his and hers of prosocial behavior: An examination of the social psychology of gender. *American Psychologist, 64*(8), 644-658. doi:10.1037/0003-066X.64.8.644

Eisenberg, N., Cumberland, A., Guthrie, I. K., Murphy, B. C., & Shepard, S. A. (2005). Age Changes in Prosocial Responding and Moral Reasoning in Adolescence and Early Adulthood. *Journal of Research on Adolescence 15*(3), 235-260. doi:10.1111/j.1532-7795.2005.00095.x

Eisenberg, N., & Spinrad, T. L. (2014). Multidimensionality of prosocial behavior: Rethinking the conceptualization and development of prosocial behavior *Prosocial development: A multidimensional approach.* (pp. 17-39). New York, NY, US: Oxford University Press.

Enchikova, E., Neves, T., Mejias, S., Kalmus, V., Cicognani, E., & Ferreira, P. D. (2019). Civic and Political Participation of European Youth: Fair Measurement in Different Cultural and Social Contexts. *Frontiers in Education, 4*(10). doi:10.3389/feduc.2019.00010

Erreygers, S., Vandebosch, H., Vranjes, I., Baillien, E., & De Witte, H. (2018). Positive or negative spirals of online behavior? Exploring reciprocal associations between being the actor and the recipient of prosocial and antisocial behavior online. *New Media & Society, 20*(9), 3437-3456. doi:10.1177/1461444817749518

Espinosa, M. P., & Kovářík, J. (2015). Prosocial behavior and gender. *Frontiers in Behavioral Neuroscience, 9*(88). doi:10.3389/fnbeh.2015.00088

Fischer, P., Greitemeyer, T., Pollozek, F., & Frey, D. (2006). The unresponsive bystander: Are bystanders more responsive in dangerous emergencies? *European Journal of Social Psychology, 36*(2), 267-278. doi:10.1002/ejsp.297

Freund, A. M., & Blanchard-Fields, F. (2014). Age-related differences in altruism across adulthood: Making personal financial gain versus contributing to the public good. *Developmental Psychology, 50*(4), 1125-1136. doi:10.1037/a0034491

Heid, A. R., Christman, Z., Pruchno, R., Cartwright, F. P., & Wilson-Genderson, M. (2016). Vulnerable, But Why? Post-Traumatic Stress Symptoms in Older Adults Exposed to Hurricane Sandy. *Disaster Medicine and Public Health Preparedness, 10*(3), 362-370. doi:10.1017/dmp.2016.15

Jetten, J., Reicher, S. D., Haslam, S. A., & Cruwys, T. (2020). *Together apart. The psychology of COVID-19*. London: Sage.

Lanza, S. T., Dziak, J. J., Huang, L., Xu, S., & Collins, L. M. (2011). *PROC LCA & PROC LTA users' guide (Version 1.2. 7)*. University Park: The Methodology Center, Penn State.

Laverack, G., & Manoncourt, E. (2015). Key experiences of community engagement and social mobilization in the Ebola response. *Global Health Promotion, 23*(1), 79-82. doi:10.1177/1757975915606674

Magis, K. (2010). Community Resilience: An Indicator of Social Sustainability. *Society & Natural Resources, 23*(5), 401-416. doi:10.1080/08941920903305674

Martela, F., & Ryan, R. M. (2016). Prosocial behavior increases well-being and vitality even without contact with the beneficiary: Causal and behavioral evidence. *Motivation and Emotion, 40*(3), 351-357. doi:10.1007/s11031-016-9552-z

Marzana, D., Marta, E., & Pozzi, M. (2012). Young Adults and Civic Behavior: The Psychosocial Variables Determining It. *J Prev Interv Community, 40*(1), 49-63. doi:10.1080/10852352.2012.633067

Miao, Q., Schwarz, S., & Schwarz, G. (2021). Responding to COVID-19: Community volunteerism and coproduction in China. *World Development, 137*, 105128. doi:10.1016/j.worlddev.2020.105128

Morin, A. J. S., Bujacz, A., & Gagné, M. (2018). Person-Centered Methodologies in the Organizational Sciences: Introduction to the Feature Topic. *Organizational Research Methods, 21*(4), 803-813. doi:10.1177/1094428118773856

Muthén, L. K., & Muthén, B. O. (1998-2015). *Mplus User's Guide* (Seventh ed.). Los Angeles, CA: Muthén & Muthén

Niesta Kayser, D., Greitemeyer, T., Fischer, P., & Frey, D. (2010). Why mood affects help giving, but not moral courage: Comparing two types of prosocial behaviour. *European Journal of Social Psychology, 40*(7), 1136-1157. doi:10.1002/ejsp.717

Norris, F. H., Stevens, S. P., Pfefferbaum, B., Wyche, K. F., & Pfefferbaum, R. L. (2008). Community Resilience as a Metaphor, Theory, Set of Capacities, and Strategy for Disaster Readiness. *American Journal of Community Psychology, 41*(1), 127-150. doi:10.1007/s10464-007-9156-6

Nowell, B., & Boyd, N. (2010). Viewing community as responsibility as well as resource: deconstructing the theoretical roots of psychological sense of

community. *Journal of Community Psychology, 38*(7), 828-841. doi:10.1002/jcop.20398

Nowell, B., & Boyd, N. M. (2014). Sense of Community Responsibility in Community Collaboratives: Advancing a Theory of Community as Resource and Responsibility. *American Journal of Community Psychology, 54*(3-4), 229-242. doi:10.1007/s10464-014-9667-x

Padilla-Walker, L. M., & Carlo, G. (2014). Prosocial behavior: Past, present, and future. In L. M. Padilla-Walker & G. Carlo (Eds.), *Prosocial behavior: A multidimensional approach* (pp. 3-16). New York, NY: Oxford University Press.

Padilla-Walker, L. M., Memmott-Elison, M. K., & Nielson, M. G. (2018). Longitudinal Change in High-Cost Prosocial Behaviors of Defending and Including during the Transition to Adulthood. *Journal of Youth and Adolescence, 47*(9), 1853-1865. doi:10.1007/s10964-018-0875-9

Palen, L., Hiltz, S. R., & Liu, C.-Y. (2007). Online forums supporting grassroots participation in emergency preparedness and response. *Communication of the ACM, 50*(3), 54–58. doi:10.1145/1226736.1226766

Penner, L. A., Dovidio, J. F., Piliavin, J. A., & Schroeder, D. A. (2005). Prosocial Behavior: Multilevel Perspectives. *Annual Review of Psychology, 56*(1), 365-392. doi:10.1146/annurev.psych.56.091103.070141

Pfefferbaum, R. L., Pfefferbaum, B., Nitiéma, P., Houston, J. B., & Van Horn, R. L. (2014). Assessing Community Resilience: An Application of the Expanded CART Survey Instrument With Affiliated Volunteer Responders. *American Behavioral Scientist, 59*(2), 181-199. doi:10.1177/0002764214550295

Pozzi, M., Marta, E., Marzana, D., Gozzoli, C., & Ruggieri, R. A. (2014). The effect of the psychological sense of community on the psychological well-being in older volunteers. *Europe's Journal of Psychology, 10*(4), 598–612. doi:10.5964/ejop.v10i4.773

Pozzi, M., Meneghini, A. M., & Marta, E. (2019). Does volunteering at events motivate repeat engagement in voluntary service? The case of young adult volunteers at EXPO Milan 2015. *TPM-Testing, Psychometrics, Methodology in Applied Psychology, 26*(4), 541-560. doi:10.4473/TPM26.4.4

Prati, G., Procentese, F., Albanesi, C., Cicognani, E., Fedi, A., Gatti, F., . . . Gattino, S. (2020). Psychometric properties of the Italian version of the sense of community responsibility scale. *Journal of Community Psychology, 48*(6), 1770-1790. doi:10.1002/jcop.22366

Procentese, F., De Carlo, F., & Gatti, F. (2019). Civic engagement within the local community and sense of responsible togetherness. *TPM-Testing, Psychometrics, Methodology in Applied Psychology, 26*(4), 513-525. doi:10.4473/TPM26.4.2

Procentese, F., Gatti, F., & Falanga, A. (2019). Sense of responsible togetherness, sense of community and participation: Looking at the relationships in a university campus. *Human Affairs, 29*(2), 247-263. doi:10.1515/humaff-2019-0020

Rand, D. G., & Epstein, Z. G. (2014). Risking Your Life without a Second Thought: Intuitive Decision-Making and Extreme Altruism. *PloS One, 9*(10), e109687. doi:10.1371/journal.pone.0109687

Rodríguez, H., Trainor, J., & Quarantelli, E. L. (2006). Rising to the Challenges of a Catastrophe: The Emergent and Prosocial Behavior following Hurricane

Katrina. *The Annals of the American Academy of Political and Social Science, 604*(1), 82-101. doi:10.1177/0002716205284677

Rushton, P. J., Chrisjohn, R. D., & Fekken, C. G. (1981). The altruistic personality and the self-report altruism scale. *Personality and Individual Differences, 2*(4), 293-302. doi:https://doi.org/10.1016/0191-8869(81)90084-2

Sorgente, A., Lanz, M., Serido, J., Tagliabue, S., & Shim, S. (2019). Latent Transition Analysis: Guidelines and an Application to Emerging Adults' Social Development. *TPM: Testing, Psychometrics, Methodology in Applied Psychology, 26*(1), 39-72. doi:10.4473/TPM26.1.3

Sproull, L., Conley, C. A., & Moon, J. Y. (2013). Prosocial behavior on the Internet. In Y. Amichai-Hamburger (Ed.), *The Social Net: Understanding our online behavior* (pp. 143-164). Oxford, UK: Oxford University Press.

Varma, M. M., Chen, D., Lin, X., Aknin, L., & Hu, X. (2020). Prosocial behavior promotes positive emotion during the COVID-19 pandemic. Retrieved from https://psyarxiv.com/vdw2e/ doi:10.31234/osf.io/vdw2e

Vezzali, L., Drury, J., Versari, A., & Cadamuro, A. (2016). Sharing distress increases helping and contact intentions via social identification and inclusion of the other in the self: Children's prosocial behaviour after an earthquake. *Group Processes & Intergroup Relations, 19*(3), 314-327. doi:10.1177/1368430215590492

Wray-Lake, L., Schulenberg, J., Keyes, K. M., & Shubert, J. (2017). The developmental course of community service across the transition to adulthood in a national U.S. sample. *Developmental Psychology, 53*(12), 2397-2408. doi:10.1037/dev0000377

Wright, M. F., & Pendergrass, W. S. (2016). Cyber prosocial behavior: Prosocial behaviors in the digital age. In T. Steele (Ed.), *Prosocial Behavior : Perspectives, Influences and Current Research* (pp. 103–122). Hauppauge, New York: Nova Science Publishers.

Xie, B., Charness, N., Fingerman, K., Kaye, J., Kim, M. T., & Khurshid, A. (2020). When Going Digital Becomes a Necessity: Ensuring Older Adults' Needs for Information, Services, and Social Inclusion During COVID-19. *Journal of Aging and Social Policy, 32*(4-5), 460-470. doi:10.1080/08959420.2020.1771237

Yang, C., Wang, Y., Wang, Y., Zhang, X., Liu, Y., & Chen, H. (2020). The Effect of Sense of Community Responsibility on Residents' Altruistic Behavior: Evidence from the Dictator Game. *International Journal of Environmental Research and Public Health, 17*(2), 460. doi:10.3390/ijerph17020460

Zaki, J. (2020). Catastrophe Compassion: Understanding and Extending Prosociality Under Crisis. *Trends in Cognitive Sciences, 24*(8), 587-589. doi:10.1016/j.tics.2020.05.006

Table 1. *Proportion of respondents reporting prosocial behaviours, by age group.*

	Age			
Prosocial Behaviour	**Overall** $(N = 2,562)$	**18 - 35 years** $(N = 1,201)$	**36 – 65 years** $(N = 1,361)$	**Chi-Square test**
Volunteered	8.8	8.9	8.7	.022
Donated money	35.1	35.6	34.7	.214
Helped a neighbour	48.3	43.5	52.5	21.024***
Shared competencies online	19.1	17.8	20.2	2.354
Shared health advice online	53.2	47.6	58.2	28.606***
Helped school children online	13.2	13.6	12.9	.228
Created hope content online	34.7	33.4	35.9	1.714
Created an online sharing platform	19.1	17.5	20.6	3.932*

Note: Values indicate % reporting the behaviour N =sample size; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 2. *Model fit statistics for Latent Class Analysis models with two to six latent classes*

Model	*-LL*	SCF	χ2 *LRT* (p value)	Stdres	LMR- LRT (p value)	BLRT	CAIC	ssBIC	BF	cmP	SSS	Entropy
Two-class	-11,028.624	1.15	1,112.953 (*p* < .001)	7.33%	0.000	0.000	22091.248	22136.659	0.00	0.00	769	0.557
Three-class	-10,948.821	1.21	535.102 (*p* < .001)	3.66%	0.000	0.000	21949.643	22019.096	0.00	0.00	374	0.440
Four-class	-10,878.005	1.01	544.122 (*p* < .001)	5.24%	0.000	0.000	21826.009	21919.504	0.02	0.02	172	0.715
Five-class	-10,838.596	1.07	405.495 (*p* < .001)	3.14%	0.000	0.000	21765.193	21882.729	0.00	0.98	243	0.717
Six-class	-10,797.298	1.04	325.472 (*p* < .001)	1.05%	0.000	0.000	21700.596	21842.173	-	388.93	209	0.743

Note. LL = log likelihood; SCF = scaling correction factor of the robust maximum likelihood estimator; χ2 LRT = likelihood ratio chi square goodness-of-fit; Stdres = standardized residuals; LMR-LRT = Lo–Mendell–Rubin likelihood ratio test; BLRT = bootstrapped likelihood ratio test; CAIC = Consistent Akaike information criterion; ssBIC = sample-size adjusted Bayesian information criterion; BF = Bayesian factor; cmP = approximate correct model probability. SSS = smaller class numerosity

Table 3. *Item-response probabilities and class prevalence rates for four-class LCA model for the full sample.*

	Latent Class			
	Money donors	Online & offline helpers	Online health information sharers	Neighbour helpers
Volunteered	0.04	0.12	0.02	0.07
Donated money	**1.00**	0.31	0.28	0.31
Helped a neighbour	0.00	0.48	0.32	**1.00**
Shared competencies online	0.06	0.31	0.00	0.04
Shared health advice online	0.10	**0.54**	**1.00**	0.00
Helped school children online	0.06	0.21	0.00	0.05
Created hope content online	0.03	0.46	0.36	0.00
Created an online sharing platform	0.03	0.30	0.03	0.06
Estimated Prevalence	7.2%	59.1%	20.5%	13.3%
Means of CART outcomes				
Transformative potential	3.53	3.78	3.12	3.44
Disaster management	3.50	3.61	3.23	3.44

Table 4. *Chi-square difference tests based on log likelihood values*

	-LL	SCF	*d*	Δ	*df*	*p-value*
Baseline model	-12,588.82	1.07	71			
Full invariance	-12,642.00	1.01	39	94.09	32	< 0.001
Partial invariance	-12,606.01	1.03	50	30.08	21	0.090

Note. -LL = model log likelihood; SCF = scaling correction factor of the robust maximum likelihood estimator; d = number of free parameters; Δ = difference test value; df = degree of freedom of the difference test.

Table 5. *Associations between latent class membership, gender and Sense of Community Responsibility (SoC-R).*

	Young adults			Adults over 35 years		
	Class Money givers OR (95% CI)**	Class Online health information sharers OR (95% CI)**	Class Neighbours helpers OR (95% CI)**	Class Money donors OR (95% CI)**	Class Online health information sharers OR (95% CI)**	Class Neighbours helpers OR (95% CI)**
Gender (Male)	**0.34 (0.22, 0.55)**	**0.54 (0.37, 0.80)**	**0.53 (0.36, 0.79)**	**0.38 (0.24, 0.61)**	**0.59 (0.40, 0.88)**	0.69 (0.44, 1.07)
SoC-R	**0.41 (0.25, 0.67)**	**0.56 (0.38, 0.83)**	**0.33 (0.35, 0.79)**	**0.36 (0.21, 0.62)**	**0.47 (0.31, 0.72)**	**0.56 (0.34, 0.93)**

Note. All comparisons are with reference class Online & offline helpers. Bold indicates statistical significance.

**Odds ratios with 95% confidence limits that do not include 1 can be considered to reflect a significant group difference.

Figure captions

Figure 1. *Item-probabilities plots for partial invariant four-class model by age group.*