**The role of social (dis)connection on the experience of trauma during the COVID-19 pandemic**

**The role of social connectedness on the experience of COVID-19 linked trauma**

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**Data availability statement:**

The data that support the findings of this study are available from the corresponding author, MM, upon reasonable request.

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**Conflict of interest:**

The authors declare no conflict of interest.

**Ethical standards:**

The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008.

**The role of social connection on the experience of COVID-19 linked trauma**

**Abstract**

**Background** Historically social connection has been one of the main ways humans have coped with threatening events such as wars and large-scale disasters ~~pandemics~~.In the context of the COVID-19 pandemic, lockdowns have deprived people of major sources of social support and coping, and others can represent threats (virus carriers), and appear threatening (face masks). Hence, in addition to physical and financial stresses, another major stress has been a sense of social disconnection and loneliness. This study explores how people’s experience of compassion and feeling socially safe and connected, in contrast to feeling socially disconnected, lonely and fearful of compassion, effects the impact of perceived threat of COVID-19 on post-traumatic growth and traumatic stress symptoms during the early months of the COVID-19 pandemic.

**Methods** Adult participants from the general population (N = 4057 across 21 countries worldwide, completed self-report measures of social connection (compassion for self, from others, for others; social safeness), social disconnection (fears of compassion for self, from others, for others; loneliness), perceived threat of COVID-19, post-traumatic growth and traumatic symptoms, between mid-April 2020 and mid-May 2020.

**Results** Perceived threat of COVID-19 predicted increased traumatic symptoms and posttraumatic growth. Social connection (i.e., compassion and social safeness) predicted higher levels of post-traumatic growth and traumatic symptoms, whereas social disconnection (i.e., fears of compassion and loneliness) predicted increased traumatic symptoms only. Social connection heightened the impact of perceived threat of COVID-19 on post-traumatic growth, while social disconnection weakened this impact. Social disconnection magnified the impact of the perceived threat of COVID-19 on traumatic symptoms. These effects were consistent across all countries.

**Conclusions** …

**Keywords:** Social connection; Compassion; Trauma; Post-traumatic growth; Moderator effect; COVID-19 pandemic; Multinational study

**The role of social (dis)connection on the experience of trauma during the COVID-19 pandemic**

**Introduction**

The rapid spread of COVID-19 around the world brought with it unprecedented psychosocial stresses that impact on mental health (Holmes et al., 2020; Li & Wang, 2020; Palgi et al., 2020; Rajkuman, 2020). The psychological impact is unprecedented because the threat from COVID-19 is continuous, invisible and universal (Galea et al. 2020; DePierro et al. 2020). In a review of the impact of COVID-19 on mental health, Vindegaard and Benros (2020) found greater anxiety and depression in the general public; increased depression, anxiety, psychological distress and poor sleep quality in healthcare professionals; and high levels of depression and post-traumatic stress symptoms in patients who had experienced COVID-19. A systematic review concluded high prevalence of post-traumatic stress symptoms (PTSD) related to the COVID-19 pandemic among health care workers and identified a lack of social support as potential predictor (D’Ettorre et al., 2021). Epidemiological studies have also documented that 17% of adults in the general population experienced PTSD symptoms during the early stages of the pandemic (Karatzias et al. 2020). In fact, it has been argued that, due to the nature of the pandemic threat, exposure to the COVID-19 pandemic and its associated health, psychological, social, and economic consequences, can constitute a valid potentially traumatic event as described in classification systems like the ICD-11 (WHO, 2018) (Shevlin et al., 2020).

While a traumatic event can cause post-traumatic symptoms, it can also be a catalyst for positive change, with mounting research showing post-traumatic growth resulting from coping with trauma and as an adaptive response to adverse trauma (Schubert et al., 2016; Wu et al., 2019). Despite the negative sequelae of COVID-19 on mental health, research has indeed begun to emerge documenting positive psychological effects of the pandemic. For example, increased post-traumatic growth was reported by carers of children in Portugal and the UK and was associated with higher levels of wellbeing (Stallard, Pereira, & Barros, 2021), and moderate levels were found in frontline nurses and were related to social support (Peng et al., 2021). Perceived social support, along with regulatory emotional self-efficacy, were also found to mediate the link between emotional creativity and posttraumatic growth during the COVID-19 crisis (Zhai et al., 2021).

Whether individuals experience mental health difficulties and trauma or experience resilience and growth (post-traumatic growth) in the face of traumatic events may depend on individual coping styles. For example, suspiciousness, intolerance of uncertainty, anxiety about death (Vazquez, Valiente, García, et al. 2021) and negative rumination (Garcia et al., 2015) were associated with developing mental health difficulties, in particular post-traumatic symptoms. In contrast, beliefs about a good world, openness to the future, identification with humanity (Vazquez et al., 2021) and constructive reflection (i.e., thinking of solutions) (Garcia et al., 2015) were associated with post-traumatic growth. Indeed, when controlling for a range of variables (e.g., psychological distress, perceived social support, age, gender, ethnicity, and education) the only significant predictor of post-traumatic growth was social support (Northfield & Johnston, 2021).

***Social connection***

Having access to caring, supportive social connections has a range of benefits for mental and physical health (Brown, & Brown, 2015; Ditzen & Heinrichs, 2014; Slavich, 2020) and is negatively linked to depression, anxiety (Armstrong et al., 2020; Kelly, Zuroff, Leybman, & Gilbert, 2012) and post-traumatic stress (Maheux & Price, 2016). In regard to major disasters, that affect groups and populations, social support is a strong predictor for how people cope with adversity, and is associated with increased resilience and post-traumatic growth (Saltzman, Pat-Horenczyk, Lombe et al., 2018; Xu & Ou, 2014). In a review by Saltzman, Hansel & Bordnick (2020), which examined a range of large-scale disasters such as Hurricane Katrina, floods, earthquakes and mining disasters, the role of social support was shown to be crucial to people’s abilities to cope, recover and prevent mental health difficulties. In other words, how people turn to each other and feel supported by each other, is central to people’s ability to adaptively respond to disasters. In addition**,** feeling socially safe is positively linked to feeling socially connected to others, supported in close social relationships and being resilient, and is negatively linked to depression and anxiety (Armstrong et al., 2020; Kelly, Zuroff, Leybman, & Gilbert, 2012). Social safeness is associated with decreased traumatic impact of early adverse events and to mediate the link between early emotional trauma and depressive symptoms (Matos et al., 2015). Feelings of ‘social safeness’ may be an emotion regulation process in its own right that can be distinguished from positive affect and negative affect, and are a unique predictor of stress (Armstrong et al., 2020), which might act as a buffer against mental health problems. Social safeness is linked to being open and receptive to the support and compassion from others (Gilbert, 2009; Kelly & Dupasquier, 2016; Seppälä et al., 2017).

There are, however, different dimensions to experiencing caring social connections, one of which is compassion (Gilbert, 2009; Seppälä et al., 2017). Compassion can be defined in various ways (Gilbert, 2017; Mascaro et al., 2020), but in evolutionary focused models it has been conceptualized as the sensitivity to suffering in self and others with a commitment to try to alleviate or prevent it (Gilbert & Choden, 2013). In light of this definition there are two major components of compassion: the preparedness to turn towards suffering and distress, and the wisdom to work out what best to do. These two dimensions of engaging with (and being sensitive to) suffering and turning one’s mind to think about what would be helpful, are the basis for the *compassionate engagement and action scales* (Gilbert, Catarino, Duarte et al., 2017*)*. Compassion can also operate as a flow whereby we can be compassionate to others, be compassionate to ourselves and also be open to the compassion from others (Gilbert, 2019; Gilbert et al., 2017). These multidimensional flows of compassion are also protective factors against psychological distress (Gilbert et al., 2017; Lindsey, 2017; Matos et al., 2017a; Steindl et al., 2018). Treating oneself and others compassionately is associated with resilience, mental and neurophysiological well-being and prosocial behavior (Di Bello et al., 2020; Gilbert et al., 2017; Kim et al., 2020; Gilbert, 2017a; Petrocchi & Cheli, 2019; Seppälä et al., 2017; Singer & Engert, 2019; Stevens & Woodruff, 2018; Weng et al., 2013). Being open and responsive to receiving compassion from others is negatively associated with symptoms of depression, anxiety and stress and positively associated with well-being (Gilbert et al., 2017), and buffers the effect of self-criticism on depression (Hermanto & Zuroff, 2016). Additionally, self-compassion has been established by extensive literature as a buffer against psychological distress (see MacBeth & Gumley, 2012, for a review). Hence receiving compassion (from others and from oneself) can act as a protective factor during difficult times. In the context of traumatic events, self-compassion has been linked to greater post-traumatic growth (Wang & Wu, 2021; Wong & Yeung, 2017), and associated with less post-traumatic stress symptomatology, with tentative evidence suggesting that compassion interventions potentially reduce PTSD symptoms (Winders et al., 2020). It has been suggested that some of the possible mechanisms between the protective effects of social support and compassion on reduced PTSD might be lower psychological inflexibility (Miron et al., 2015), emotional dysregulation (Scoglio et al., 2018) and avoidance strategies (Thompson & Waltz, 2008). In the context of COVID-19, both self-compassion as a unidimensional construct (Jiménez et al., 2020; Kavaklı et al., 2020; Li et al., 2021), and the flows of compassion as a multidimensional construct (Matos et al., 2021a) have been found to be protective factors against psychological distress. In particular, compassion for self buffered the effects of the perceived threat of COVID-19 on psychological distress, whereas compassion from others alleviated the impact of fears of contracting COVID-19 on social safeness (Matos et al., 2021).

***Social disconnection***

In contrast to feeling socially safe and connected to others and being able receive and give compassion, people can feel socially disconnected and lonely, and be fearful of compassion. Such processes of social disconnection have been identified as increasing the risk of mental and physical health difficulties (Cacioppo & Patrick, 2008; Kirby et al., 2019; Leigh-Hunt et al., 2017).

During the COVID-19 pandemic, beyond the threat of being contaminated with the virus, spreading the virus to family, friends, and vulnerable people, lockdown actions taken by governments in an effort to contain the virus also had a significant impact on mental health through physical entrapment inside homes (Holmes et al., 2020) and reducing opportunities for social support (Gloster et al., 2020). Lockdown was found to increase experiences of depression, anxiety, stress and social disconnection and loneliness (Cao et al, 2020; Duan & Zhu, 2020; Holmes et al., 2020; Kilgore et al., 2020; Palgi et al., 2020; Saltzman et al., 2020; Serafini et al., 2020). While physical loneliness is an obvious issue in the pandemic (Palgi et al., 2020), emotional loneliness where individuals feel emotionally disconnected and unable to share difficult emotions and experiences or gather support, plays a central role in coping with adversity. As Saltzman et al. (2020) note

During this pandemic, the messaging has also had a negative impact in reinforcing the “you’re alone or isolated” theme. For example, the term “social distancing” has been a constant call-to-action on TV, radio, and social media versus the more appropriate term “physical distancing,” adding to the perception of isolating oneself socially (p.55).

Unique to this pandemic, in contrast to previous disasters where social support was found crucial to protect mental health and promote resilience and post-traumatic growth (Saltzman et al., 2020; Xu & Ou, 2014), has been it depriving people of the very thing they need (social support) in order to become resilient and adaptively cope with adversity. Social isolation has indeed been found to stimulate midbrain craving responses, similar to hunger, associated with the craving of social interactions (Tomova, Wang, Thompson, et al., 2020).

Moreover, some individuals can develop and experience fears of receiving and giving compassion (Gilbert & Mascaro, 2017; Gilbert et al., 2011), being unable to activate compassionate motivational systems or use caring relationships as affect regulators (Ebert et al., 2018). Fears of compassion can be experienced across the three flows (i.e., for others, from others, for self), and are understood as inhibitors that hinder compassionate motivation of being ‘turned-on’ or ‘acted on’, because the signal of suffering is either not noticed/avoided or does not result in an action to prevent or alleviate that suffering. Fears of compassion may be linked to the belief that compassion is a self-indulgence or a weakness, that if compassionate (to oneself or others) one will become too distressed or unable to cope, or that oneself or others are not deserving of compassion (Gilbert et al., 2011).  Thus, fears of compassion inhibit one’s ability to activate compassion across the three flows which negatively affects physiological and psychological health and well-being (Kirby et al., 2017b). There is now considerable evidence documenting that fears of compassion, especially of self-compassion and of receiving compassion from others, are strongly linked to problems of depression, anxiety and stress, and to vulnerability factors, such as self-criticism and shame (Gilbert et al., 2011; Kirby, Day & Savage, 2019). Fears of compassion for the self and from others were associated with the traumatic impact of early emotional experiences and were significant mediators of the impact of adverse events on depression and anxiety symptoms, and on paranoid ideation about other people as potential threats (Matos, Duarte, & Pinto-Gouveia, 2017). In the context of traumatic events, a lack of fear of self-compassion was associated with less PTSD symptomatology (Winders et al., 2020). In a multinational study during the COVID-19 pandemic, Matos et al. (2021b) found that all the flows of fears of compassion magnified the impact of perceived threat of COVID-19 on psychological distress, but only fears of compassion from others amplified the effect of the perceived likelihood of contracting the virus on how socially safe people felt.

***Aims***

Given the need to examine both protective and risk factors beneath the negative and positive psychological consequences of the current global COVID-19 pandemic (Brewin et al., 2020; Holmes et al., 2020), the current study examines how dimensions of social connection (i.e., the compassion flows and social safeness) and social disconnection (i.e., fears of compassion and loneliness) relate to post-traumatic growth and post-traumatic stress, during the early months of the COVID-19 pandemic in a global adult population across 21 countries. It was hypothesised that post-traumatic stress and growth would be impacted by the degree to which individuals feel socially safe, connected and open to compassion, or disconnected, lonely and fearful of compassion. Specifically, this study aims to examine whether the dimensions of social connection (i.e., the compassion flows and social safeness) and social disconnection (i.e., fears of compassion and loneliness) moderate the impact of perceived threat of COVID-19 (i.e., fear of contracting SARS-Cov-2) on post-traumatic growth and on symptoms of post-traumatic stress. It was hypothesised that the social connection component (i.e., the compassion flows and social safeness) would magnify the effects of perceived threat of COVID-19 on post-traumatic growth (i.e., recovery and growth), and, conversely, that the social disconnection component (i.e., fears of compassion and loneliness) would magnify the impact of perceived threat of COVID-19 on post-traumatic stress symptoms.

**Methods**

***Participants***

The research sample comprised of 4057 participants from 21 countries: Argentine (ARG) *N* = 257, Australia (AUS) *N* = 109, Brazil (BRA) *N* = 299, Canada (CAN) *N* = 115, Chile (CHL) *N* = 282, China (CHN) *N* = 77, Columbia (COL) *N* = 50, Cyprus (CYP) *N* = 38, Denmark (DNK) *N* = 141, France (FRA) *N* = 115, Great Britain (GBR) *N* = 268, Greece (GRE) *N* = 145, Italy (ITA) *N* = 160, Japan (JPN) *N* = 522, Mexico (MEX) *N* = 181, Poland (POL) *N* = 82, Portugal (PRT) *N* = 394, Saudi Arabia (SAU) *N* = 256, Slovakia (SVK) *N* = 46, Spain (ESP) *N* = 392, and The United States of America (USA) *N* = 128. In relation to the gender, there were 18.2% of males and 80.8% of females, 0.4% of participants reported other gender and 0.6% preferred not to report their gender. The mean age of the sample was 41.45 years old (*SD* = 14.96). There were 32.7% of health professionals and 67.3% of non-health professionals in the sample.

***Measures***

The online survey collected sociodemographic information (nationality, country of residence, age, gender) and administered self-report instruments assessing dimensions of social connection (i.e., compassion for self, from others, for others, and social safeness), dimensions of social disconnection (i.e., fears of compassion for self, from others, for others, and loneliness), perceived threat of COVID-19, post-traumatic growth and post-traumatic stress symptoms.

*Compassionate Engagement and Action Scales* (CEAS; Gilbert et al., 2017) includes three scales that assess the three flows of compassion: self-compassion, compassion to others and compassion received from others, with 13 items each. Each scale measures different elements of compassion *Engagement* (6 items and 2 filler items) and *Action* (4 items and 1 filler item). Participants are asked to rate each item on a ten-point Likert scale, based on how frequently it occurs, from 1 (never) to 10 (always). Each scale can be analysed in terms of the Engagement and Action components separately or as a single factor. Here we use each of the three flows of compassion as a single factor scales. In the original study, the CEAS showed good internal consistencies and temporal reliability (Gilbert et al., 2017). In the present study, internal consistency ranged between good and excellent: Compassion for self-Engagement α = .74/Action α = .89; Compassion for others-Engagement α = .81/Action α = .88; Compassion from others-Engagement α = .91/Action α = .93.

*Social Safeness and Pleasure Scale* (SSPS; Gilbert et al., 2008) is an 11-item self-report measure that assesses the extent to which people usually experience their social world as safe, warm and soothing and how connected they feel to others. Participants are asked to rate on a five-point Likert scale how often they feel as described in each sentence from 1 (almost never) to 5 (almost all the time). Higher scores represent higher perceived social safeness and connectedness to others. In the original study, internal consistency was excellent (α= .92). In the present study, internal consistency is excellent (α=.94).

*Fears of Compassion Scales* (FCS; Gilbert et al., 2011) are three scales that assess fears of compassion, one for each flow: 1) fears of feeling and expressing compassion for others (10-items), 2) fears of receiving compassion from others (13-items), 3) fears of compassion for self (15-items). Respondents are asked to rate on a five-point Likert scale how much they agree with each statement, from 0 (don’t agree at all) to 4 (completely agree). Higher scores represent higher fears of compassion.  In the original study, Cronbach’s alphas were .72 for FCS for others, .80 for FCS from others, and .83 for FCS self-compassion (Gilbert, et al., 2011). In the current study, internal consistencies ranged between .89 and .95 (FCS self-compassion α = . 93, FCS compassion for others α = . 89, FCS compassion from others α = . 95).

*UCLA Loneliness Scale* (UCLA LS; Russell, 1996) is a 20-item self-report measure that assesses one’s subjective feelings of loneliness/social isolation. Participants are asked to rate on a 4-point Likert scale how often each sentence is descriptive of them, from 0 (I never feel this way) to 3 (I often feel this way). After conversion of the reverse coded items, higher scores represent more frequent feelings of loneliness/social isolation. In the original study, Russell (1996) found the scale’s internal consistency to range between .89 and .94 across all samples. In the present study, α= .XX for the overall scale.

*The Perceived Coronavirus Risk Scale* (PCRS; Kanovský & Halamová, 2020, adapted from Napper et al., 2012) is an 8-item self-report questionnaire that assesses participants’ fear of getting infected with SARS-Cov-2 in two dimensions: Fear of Contraction (affective aspect) and Likelihood of Contraction (cognitive aspect). Participants are asked to rate on a five-point Likert scale how much they agree with each sentence from 1 (strongly disagree) to 5 (strongly agree). It has one reversed item. Higher scores represent higher perceived threat of COVID-19. In the original study, Kanovsky and Halamová (2020) reported internal consistency to be acceptable (Fear of Contraction α = .72; Likelihood of Contraction α =.71). In this study, internal consistency was acceptable (Fear of Contraction α = .70; Likelihood of Contraction α = .70).

*Posttraumatic Growth Inventory* (Tedeschi & Calhoun, 1996) is a 21-item self-report measure that assesses positive outcomes reported by people who have experienced traumatic events. This instrument is organized into five subscales that represent Relating to Others, New Possibilities, Personal Strength, Spiritual Change and Appreciation of Life. Participants are asked to rate on a 6-point Likert scale how much they experienced the changes described by each item, from 0 (I did not experience this change as a result of my crisis) to 5 (I experienced this change to a very great degree as a result of my crisis). Higher scores reflect higher benefits as outcomes of coping with traumatic events. In the original study, Tedeschi & Calhoun (1996) found the subscales’ internal consistency to range between good and questionable (New Possibilities α = .84; Relating to Others α = .85; Personal Strength α = .72; Spiritual Change α = .85; Appreciation of Life α = .67). The internal consistency for the overall scale is good (α = .90). In the present study, XXXX

*Impact of Event Scale - Revised* (IES-R; Weiss & Marmar, 1997) is a 22-item self-report measure that assesses current subjective distress for any specific life event. This instrument is organized into three subscales that assess traumatic stress symptoms related to Intrusions, Avoidance and Hyperarousal. Participants are asked to rate on a 5-point Likert scale how distressing each difficulty described by the items has been for them, from 0 (Not at all) to 4 (Extremely). Higher scores mean higher distress associated with each item during the past week. In the original study, Weiss & Marmar (1997) found the subscales’ internal consistency to range between .87 and .94 for the Intrusion subscale, .84 and .87 for the Avoidance subscale, and .79 and .91 for the Hyperarousal subscale. In the current study, α=.XX for Intrusion, α=.XX for Avoidance and α=.XX for Hyperarousal.

***Procedures***

The current study is part of a broader longitudinal multinational study on compassion, social connectedness and trauma resilience during the COVID-19 pandemic (e.g., Matos et al., 2021a b). The study was approved by the Ethics Committee of the Faculty of Psychology and Educational Sciences of the University of Coimbra (UC; CEDI22.04.2020) and was conducted in compliance with the 1964 Helsinki Declaration and its later amendments. Local national ethical approval was also obtained whenever necessary. The current analysis used cross-sectional data collected between mid-April 2020 and mid-May 2020, across 21 countries from Europe, (United Kingdom, Portugal, Spain, Italy, France, Greece, Cyprus, Poland, Slovakia, Denmark), North America (USA, Canada), South America (Brazil, Argentina, Chile, Colombia, Mexico), Asia (China, Japan), Oceania (Australia), and Middle East (Saudi Arabia).

An online survey was created by the research team in English and translated to 11 other languages using forward/backward procedures. When there was already a validation of a self-report questionnaire for a particular language/country that version was selected. The surveys were hosted at the UC institutional account in the online platform<https://www.limesurvey.org/pt/>, and a website was created to support the dissemination of the study across countries (<https://www.fpce.uc.pt/covid19study/>). The study was disseminated through social and traditional media platforms and institutional/professional emailing lists in each country, using snowball sampling. In addition, Facebook ads were used to promote participation among the general population in some countries. Prior to completing the survey, participants were informed about the study aims and procedures, and the voluntary and anonymous nature of participation. Confidentiality of the collected data was assured, and written informed consent was obtained before the completion of the study protocol. The survey was self-paced and about 25min long. There was no payment for completing the survey.

***Data analysis***

For statistical analyses, we used the R program version 4.0.3 (R Core Team, 2020), package “gamlss” (Rigby & Stasinopoulos, 2005) for regression analysis. For the multilevel simultaneous principal component analysis, we used the dedicated software described in Ceulemans et al. (2016).

Data analyses were proceeded in two steps: (1) to reduce the large number of moderator variables, a Multilevel Simultaneous Component Analysis to obtain component scores was conducted; (2) a set of multilevel regression models to test moderator effects were tested. Firstly, to examine the moderator effects of dimensions of social connection and social disconnection, the large number of variables were reduced. Two main moderator effects were hypothetized linked to dimensions of social connection and social disconnection. The social connection component (41 variables in total), measured by the CEAS compassion for self scale (10 variables), CEAS compassion to others scale (10 variables), CEAS compassion from others scale (10 variables), Social Safeness Scale (11 variables); and the social disconnection component (58 variables in total), measured by the FOCS Fear of compassion for self scale (15 variables), FOCS Fear of compassion for others scale (13 variables), FOCS Fear of compassion from others scale (10 variables), and the UCLA loneliness scale (20 variables).

The structure of the data (individual responses nested in countries) resulted in multivariate two-level data. As mentioned above, the large number of variables that could moderate the effects of the main predictor (perceived threat of COVID-19) had to be reduced to enter a parsimonious regression model. Principal component analysis (PCA) is routinely applied for such cases. However, standard PCA analysis does not take into account the multilevel structure of data and therefore its component scores could be heavily distorted. Timmerman (2006) proposed a class of multilevel simultaneous component models (MLSCA). MLSCA has already been used to study cross-cultural differences (Kuppens, Ceulemans, Timmerman, Diener, & Kim-Prieto, 2006), and has been recently proposed as a concise alternative (Ceulemans et al., 2016). We were not particularly interested in the between-model variance (components at the level of countries), but rather in the within-model variance (components at the level of individual respondents). Our aim was to obtain component scores which were unbiased by the multilevel structure of our data and captured as much of the variance in the data as possible. Unlike the between-submodel, the within-submodel accounts for the covariance structure of the variables within the countries.

There were three main steps of an MLSCA analysis (Ceulemans et al., 2016): (1) to fit the different MLSCA variants; (2) to select an appropriate model, i.e., to specify optimal number of within-components and the most adequate model variant for the within-part; (3) to discuss the component matrices of the retained solution; (4) to extract the component score(s) for the subsequent regression analysis.

To select the optimal number of components, Ceulemans et al. (2016) recommend using the CHull (convex-hull) test (Ceulemans & Kiers, 2006; Wilderjans, Ceulemans, & Meers, 2013), which is similar to the widely used scree-test (Cattell, 1966), and works well for MLSCA as well (Ceulemans, Timmerman & Kiers, 2011). To conduct this test, the percentage of the variance accounted for (VAF), is plotted against a complexity measure (the number of free parameters corrected for the number of observations). Next, the convex hull of this plot is obtained and the solutions that are located on the higher boundary of this convex hull – denoted as the hull solutions – are retained, as they have the best fit versus complexity balance (Ceulemans et al., 2016).

As far as the social connection component is concerned, the CHull test (see Online Supplementary Material, Table 1) recommended a single principal component, and so did it for the social disconnection component (see Online Supplementary Material, Table 2). Therefore, we could safely extract two component scores representing individual responses – these two component scores take into account multilevel structure of our data and are therefore unbiased with regards to the differences between countries.

We fitted two sets of multilevel regression models: a) with the sum score of the Post-Traumatic Growth scale as dependent variable; b) with the sum score of the Impact of Event Scale-Revised Scale (as a measure of post-traumatic stress) as dependent variable. For each set of models, we have tested the PCRS Fear of contraction scale as the predictor / main effect, the social connection and social disconnection component scores extracted from the MSPCA (see above) as predictors/main effects, and their interaction (social connection and social disconnection component scores as moderators). *R*2 (‘variance explained’) statistics were used to measure the effect size of the model. To select the appropriate regression models, we performed: a) analysis of (quantile) residuals to assess the goodness of fit of each model (Dunn & Smyth, 1996); b) likelihood-ratio tests and information criteria AIC and BIC to compare nested models.

**Results**

***Post-Traumatic Growth***

The first model (m1) was the standard multilevel linear model. After checking its residuals, we concluded that they were platykurtic with heavy tails (see Online Supplementary Material, Figure 1). The second model (m2) was identical, but we tried to predict the variance as well (heteroscedastic model). However, problems with kurtosis and heavy tails were not resolved (see Online Supplementary Material, Figure 2). To solve this problem, we have to relax the assumption of exponential family, and look at models which can explicitly model skewness and kurtosis (normal Gaussian models being their special cases), namely generalized additive models (Stasinopulos et al., 2017). These have extra parameters in addition to standard mean and variance estimation of normal distribution, and these extra parameters account for skewness and kurtosis – Skew Power Exponential distribution. This distribution was introduced by Azzalini (1986) as his type II distribution and was further developed by DiCiccio and Monti (2004). The parameter Nu determines the skewness of the distribution with Nu > 0 indicating positive skewness and Nu < 0 negative. The parameter Tau determines the kurtosis of the distribution, with Tau > 2 for platykurtic data and Tau < 2 for leptokurtic. With Nu = 0 and Tau = 2, this distribution is reduced to the standard normal (Gaussian) distribution.

After fitting this model, it was clear that its fit with our data was acceptable (see the residuals of this model Online Supplementary Material, Figure 3). Note that residuals (not dependent variable) should follow normal distribution if the model has an adequate fit: in other words, residuals should have normal distribution even if the dependent variable is skewed and/or kurtotic – this outcome is justification for the explicit modelling of skewness and kurtosis of the dependent variable. If we compare fit of three fitted models, the Skew Exponential Power model outperformed both Gaussian models (see Table 1). The coefficients of best fitting model are presented in Table 2.

The main effect of fear of contraction on post-traumatic growth was significant (and positive): fear of contraction increases post-traumatic growth. The main effect of the social connection component on the post-traumatic growth was significant (and positive), which means that compassion across the three flows and social safeness increase post-traumatic growth. The main effect of the social disconnection component on post-traumatic growth was not significant. The interaction effect of fear of contraction and the social connection component was significant and positive, indicating that the three flows of compassion and social safeness significantly moderate (magnify) the impact of fear of contraction on post-traumatic growth, across all countries. The interaction effect of fear of contraction and the social disconnection component was also significant and negative, revealing that fears of compassion and loneliness significantly moderate (reduce) the impact of fear of contraction on post-traumatic growth, across all countries. Of note, there was significant skewness and kurtosis in the dependent variable (parameters Nu and Tau were both significant). Marginal *R*2 amounts to 0.23 which means that all predictors account for 23 % of variance of post-traumatic growth.

**Table 1**

*Likelihood-ratio tests and information criteria for the Post Traumatic Growth (PTG) models*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Model | Deviance | χ2 (df) | p-value | AIC | BIC | dist | variance |
| m1 | 37219 | - | - | 37271 | 37434 | normal | homoscedastic |
| m2 | 37032 | 187 (5) | < .001 | 37127 | 37425 | normal | heteroscedastic |
| **m3** | **36752** | **310 (2)** | **< .001** | **36850** | **37158** | **SEP** | **Heteroscedastic** |

*Note.* χ2 = chi-square. df = degrees of freedom. AIC = Akaike information Criterion. BIC = Bayes-Schwarz Information Criterion. dist = distribution., SEP = Skew Power Exponential. Best model is displayed in bold.

**Table 2**

*The coefficients of best fitting Post Traumatic Growth (PTG) model - the Skew Exponential Power model*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Predictor | β (SE) | p-value | Σ (SE) | ν (SE) | τ (SE) |
| Intercept | **35.05 (1.60)** | < .001 | **3.64 (0.02)** | **0.30 (0.04)** | **1.67 (0.05)** |
| PTCSFear | **1.77 (0.29)** | < .001 | **-0.04 (0.01)** | - | - |
| SocialConnection | **4.52 (0.34)** | < .001 | **0.07 (0.01)** | - | - |
| SocialDisconnection | -0.26 (0.78) | .737 | **-0.04 (0.02)** | - | - |
| PTCSFear:SocialConnection | **0.60 (0.26)** | .023 | **0.02 (0.01)** | - | - |
| PTCSFear:SocialDisconnection | -0.11 (0.09) | .194 | **-0.01 (0.01)** | - | - |

*Note.* β = beta coefficient. SE = standard error. Σ (sigma) = variance. ν (nu) = skewness parameter. τ (tau) = kurtosis parameter. Significant effects are displayed in bold.

**Post-Traumatic Stress**

The same procedure was followed for post-traumatic stress. The first model (n1), the standard multilevel linear model, displayed a bad fit with data (see Online Supplementary Material, Figure 4): kurtosis and skewness were problematic. The second, heteroscedastic model (n2) did not improve the fit (see Online Supplementary Material, Figure 5). The multilevel heteroscedastic model with Skew Power Exponential distribution (explicitly modelling the skewness and kurtosis) had acceptable fit (see the residuals of this model in Online Supplementary Material, Figure 6). If we compare the fit of the three fitted models, we can see that the Skew Exponential Power model outperformed both Gaussian models (see Table 3). The coefficients of best fitting model are presented in Table 4.

**Table 3**

*Likelihood-ratio tests and information criteria for the Post-Traumatic Stress (IESR) models*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Model | Deviance | χ2 (df) | p-value | AIC | BIC | dist | variance |
| n1 | 35118 | - | - | 35271 | 35434 | normal | homoscedastic |
| n2 | 35032 | 89 (5) | < .001 | 35132 | 35412 | normal | heteroscedastic |
| **n3** | **34752** | **221 (2)** | **< .001** | **34852** | **35158** | **SEP** | **Heteroscedastic** |

*Note.* χ2 = chi-square. df = degrees of freedom. AIC = Akaike information Criterion. BIC = Bayes-Schwarz Information Criterion. dist = distribution., SEP = Skew Power Exponential. Best model is displayed in bold.

**Table 4**

*The coefficients of best fitting Post-Traumatic Stress (IESR) model - the Skew Exponential Power model*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Predictor | β (SE) | p-value | Σ (SE) | ν (SE) | τ (SE) |
| Intercept | **18.90 (0.51)** | < .001 | **2.50 (0.03)** | **0.65 (0.03)** | **0.78 (0.04)** |
| PTCSFear | **4.59 (0.21)** | < .001 | **0.06 (0.01)** | - | - |
| SocialConnection | **1.01 (0.25)** | < .001 | 0.01 (0.01) | - | - |
| SocialDisconnection | **2.22 (0.73)** | .003 | **0.31 (0.04)** | - | - |
| PTCSFear:SocialConnection | 0.36 (0.22) | .099 | -0.01 (0.01) | - | - |
| PTCSFear:SocialDisconnection | **0.46 (0.08)** | < .001 | **-0.02 (0.01)** | - | - |

*Note.*β = beta coefficient. SE = standard error. Σ (sigma) = variance. ν (nu) = skewness parameter. τ (tau) = kurtosis parameter. Significant effects are displayed in bold.

The main effect of fear of contraction on post-traumatic stress was significant (and positive): fear of contraction increases traumatic symptoms. The main effect of the social connection component on post-traumatic stress was significant and positive which means that compassion and social safeness increase traumatic symptoms. The main effect of the social disconnection component on post-traumatic stress was also significant and positive, indicating that fears of compassion (for self, from others and for others) and loneliness increase traumatic stress symptoms. The interaction effect of fear of contraction and the social connection component was not significant. However, the interaction effect of fear of contraction and the social disconnection component was significant and positive revealing that that fears of compassion and loneliness significantly moderate (heighten) the impact of the fear of contraction on post-traumatic stress, across all countries. Note again that there was significant skewness and kurtosis in the dependent variable (parameters Nu and Tau were both significant). Marginal *R*2 amounts to 0.39 which means that all predictors account for 39 % of variance.

**Discussion**

The COVID-19 pandemic has had severe multifaceted consequences for people’s psychosocial wellbeing and mental health (Li & Wang, 2020; Palgi et al., 2020; Rajkuman, 2020), and hence a better understanding of the underlying protective and risk factors of both the negative and positive psychological effects of the pandemic is warranted (Brewin et al., 2020; Holmes et al., 2020). In contrast to previous large-scale disasters, the pandemic has been unique in the respect that, due to the restrictions to human interaction imposed by governments, social connection has not been available as a way to cope with this invisible, persistent and global threat. This study therefore compared the moderating effects of dimensions of social connection (i.e., the compassion flows and social safeness) and social disconnection (i.e., fears of compassion and loneliness) on the impact of perceived threat of COVID-19 on either developing post-traumatic growth or post-traumatic symptoms in the context of the pandemic.

*Post-traumatic growth*

Higher perceived threat of COVID-19 predicted greater post-traumatic growth. This finding was in line with our expectations given that post-traumatic growth has been proposed a possible positive psychological consequence of the encounter with a traumatic event (Tedeschi et al., 2018; Schubert et al., 2016; Wu et al., 2019). In fact, when it comes to negative events, perceiving an event as traumatic seems to be a prerequisite for growth (Zoellner & Maercker 2006; Helgeson et al. 2006). Post-traumatic growth has been associated with post-traumatic symptoms and can be regarded as a coping effort in the face of enduring distress (Hobfoll et al., 2008; Nishi et al., 2010). It is logical that one would not have post-traumatic growth without the experience of traumatic stress and, whilst several studies have found this association to be positive, others have found it to be negative (Hall et al., 2008) and suggested this might be due to how this construct was measured and the dimensions underpinning post-traumatic growth (Nishi et al., 2010). In support of our findings, recent research has also reported the presence of post-traumatic growth in the context of current threat of COVID-19 (e.g., Stallard et al., 2021; Peng et al., 2021; Vazquez et al. 2021).

Social connection was a significant predictor of post-traumatic growth, which means that compassion across the three flows and social safeness increase post-traumatic growth. Individuals who feel socially safe and connected to others, and who are able to be compassionate towards themselves, to others and that receive compassion from others in the face of suffering and adversity, reveal increased post-traumatic growth in the context of the pandemic. This is congruent with the notion that having access to caring, supportive social connections has a range of benefits for mental wellbeing (Brown, & Brown, 2015; Ditzen & Heinrichs, 2014; Slavich, 2020). Social support has indeed been a primary coping strategy linked to increased post-traumatic growth and resilience for people during historical large-scale disasters (Saltzman, et al., 2020), as well as during the current pandemic (Northfield & Johnston, 2021). As one of the dimensions of our social connection component, compassion has been associated with greater well-being and resilience in the face of adversity (MacBeth & Gumley, 2012; Steindl et al., 2018; Zessin et al., 2015). In particular, our study expands on current evidence revealing that self-compassion is associated with greater post-traumatic growth in the context of traumatic events (Wang & Wu, 2021; Wong & Yeung, 2017).

Interestingly, when controlling for the effect of social connection, the social disconnection component did not significantly predict post-traumatic growth, revealing that fears of compassion and loneliness are not associated with post-traumatic growth in relation to the pandemic. This is a novel finding since, although fears of compassion (Winders et al., 2020) and lack of social support (D’Ettorre et al., 2021) have been associated with PTSD during the COVID-19 crisis, no previous research has explored their relationship to post-traumatic growth. Thus, our findings suggests that, in the context of the current pandemic, social connection (i.e., compassion and social safeness) emerges as the key predictor of post-traumatic growth.

There was a significant and positive moderator effect of social connection on the impact of perceived threat of COVID-19 and post-traumatic growth. This effect was consistent across all 21 countries and was not affected by differences in questionnaire responses between countries. This is a novel and important finding that suggests that, in the context of the pandemic and across countries, one’s ability to activate compassion motivational systems across the three flows, and to experience social safeness and connectedness to others strengthens the impact of perceived threat of COVID-19 on post-traumatic growth in the face of pandemic threat. This is in line with our hypothesis that the social connection component (i.e., the compassion flows and social safeness) would magnify the effects of perceived threat of COVID-19 on recovery and growth during the pandemic. Our results build upon extensive literature on the benefits of caring supportive social connections for mental wellbeing (Brown, & Brown, 2015; Ditzen & Heinrichs, 2014; Slavich, 2020), and for post-traumatic growth and resilience in the context of other large-scale disasters (Saltzman, et al., 2020), or during the COVID-19 crisis (Northfield & Johnston, 2021). In particular, identification with humanity, beliefs about a good world, and openness to the future were found to be associated with post-traumatic growth during the COVID-19 pandemic (Vazquez et al., 2021). This seems to be congruent with our data suggesting that when individuals are able to feel socially safe in the world and connected to others, and activate compassion motivational systems in the face of suffering, this facilitates their resilience and growth in the face of trauma. Our findings are also in accordance with a recent study which found that self-compassion and receiving compassion from others buffer the impact of perceived threat of COVID-19 on psychological distress and social safeness (Matos et al., 2021). In support, other studies have documented the protective role of compassion (e.g., Ferreira et al., 2015; Steindl et al., 2018) and social safeness (Armstrong et al., 2020; Kelly et al., 2012; Matos et al., 2015) against psychological distress and as promoters of well-being and resilience in the face of adversity.

As expected, social disconnection was found to negatively moderate the impact of perceived threat of COVID-19 on post-traumatic growth. This finding reveals that fears, blocks and resistances to giving and receiving compassion, along with experiences of physical and emotional loneliness, significantly diminish the possibility of post-traumatic growth in the face of perceived threat of COVID-19. This novel finding expands the current evidence base and suggests that in the absence of social connection post-traumatic growth is hampered. Taken together, these results highlight that it is the social connection component, in particular compassion across the three flows and feelings of social safeness, that seems to be key to promote post-traumatic growth as an adaptive coping mechanism or as an outcome of positive psychological change in the face of a threatening event such as the current pandemic.

*Post-traumatic stress*

Perceived threat of COVID-19 emerged as the strongest predictor of increased post-traumatic stress. This corroborates the proposition that, exposure to the COVID-19 pandemic and to its multifaceted consequences, can be a potentially traumatic event and trigger PTSD symptomatology (Shevlin et al. 2020). This finding is in accordance with mounting research demonstrating that PTSD is an outcome of the COVID-19 pandemic (D’Ettorre et al., 2021; Vindegaard & Benros, 2020), and with epidemiological studies reporting the experience of PTSD symptoms amongst the general adult population during the early stages of the pandemic (Karatzias et al., 2020). Consistent with our results are also several studies establishing a link between fears of COVID-19 and indicators of poor mental health (e.g., Ahorsu et al., 2020; Bitan et al., 2020; Di Crosta et al., 2020; Fitzpatrick et al., 2020; Kanovsky & Halamová, 2020; Matos et al., 2021a).

Interestingly, perceived threat of COVID-19 was not only a predictor of increased post-traumatic symptoms, but also a predictor of greater post-traumatic growth. This finding could be understood in light of previous research which describes how perceiving an event as threatening and severe can influence both the development of post-traumatic symptoms and post-traumatic growth (García et al. 2015). Both traumatic symptoms and growth may occur because of the suffering produced by a highly stressful event, such as the COVID-19 pandemic (Vasquez et al., 2020).

Social disconnection predicted higher levels of post-traumatic stress, revealing that being fearful of compassion and feeling lonely and disconnected from others increased traumatic stress symptoms in the context of the current pandemic. In line with our hypothesis, social disconnection positively moderated the impact of perceived threat of COVID-19 on post-traumatic stress. This is a key finding which indicates that in the pandemic context, fears of receiving (from oneself and others) and giving compassion and loneliness heighten the impact of perceived threat of COVID-19 on symptoms of post-traumatic stress, across all countries.

It is well established that feeling socially disconnected and lonely, and being resistant to or afraid of compassion are major vulnerability factors for mental health problems (Cacioppo & Patrick, 2008; Kirby et al., 2019; Leigh-Hunt et al., 2017). In fact, previous evidence has shown that a lack of social support is one of the best predictors of PTSD (Brewin et al., 2000; Ozer et al. 2003). This is particularly relevant under the unique circumstances of pandemic threat, where beyond the threat of the virus itself, the (almost) universal preventive containment and social distancing measures used to control the spread of the virus, have deprived people from one of the most powerful physiological and psychological regulators of threat – access to supportive social relationships (Cacioppo & Patrick, 2008; Gloster et al., 2020; Saltzman et al., 2020). Extensive research has confirmed that lockdown has increased experiences of social disconnection, loneliness and psychological distress (Cao et al, 2020; Duan & Zhu, 2020; Holmes et al., 2020; Kilgore et al., 2020; Palgi et al., 2020; Saltzman et al., 2020; Serafini et al., 2020). Studies have additionally revealed that, during the pandemic, loneliness and lack of social support are associated with greater mental health difficulties (Killgore et al., 2020; Saltzman et al., 2020), and that suspiciousness, which is typically linked to a lack of interpersonal trust and to low perceived social support, is related to post-traumatic stress symptoms and impairment (Vasquez et al., 2020). Consistent with our data, Matos et al. (2021) demonstrated that fears of compassion were not only associated with greater psychological distress, but they also magnified the impact of perceived threat of COVID-19 on symptoms of depression, anxiety and stress, and that fears of receiving compassion from others amplified the negative effect of threat of COVID-19 on social safeness. Our data extends previous studies on the mediating role of fears of compassion between early emotional trauma and symptoms of depression, anxiety and paranoid ideation (Matos et al., 2017), and on loneliness as a major vulnerability factor in the context of trauma (Dagan et al., 2019; Solomon et al., 2015).

Therefore, if under the pandemic threat one is afraid, resistant or unable to activate compassionate motivational systems across the three flows or use caring relationships as affect-regulators (Ebert et al., 2018), then they will lack vital coping mechanisms and be unable to psychologically and physiologically regulate threatening internal (e.g., thoughts, emotions, bodily sensations) and external (e.g., someone close or themselves getting the virus, financial difficulties, work stresses) experiences. Thus, one will be more vulnerable to experience post-traumatic stress in relation to the pandemic threat, including intrusions, hyperarousal and avoidance symptoms.

Surprisingly, social connection (albeit with a smaller effect than social disconnection) predicted increased levels of post-traumatic stress, suggesting that compassion and social safeness may increase traumatic symptoms in the face of pandemic threat. However, there was no significant moderator effect of social connection on the relationship between perceived threat of COVID-19 and post-traumatic stress symptoms. A possible explanation for this finding might be the loss of social relationships, and fears for others health and wellbeing due to the unique nature of the pandemic threat and its’ associated containment and lockdown measures. Unlike other mass disasters where people used social connection and support as a way of coping with adversity and regulating threat, the current pandemic can be regarded as a form of social trauma where, although faced with a global, unpredictable and highly threating situation, people were unable to come together, feel socially safe and supported by others and give and receive compassion (Gilbert, 2020; Saltzman et al., 2020). This was especially the case at the beginning of the pandemic, when the data was collected across countries. In this period, this universal and unprecedented event was presented by authorities as a very hiogh and unpredictable threat, with no solution in sight, other people were seen as a threat for contagion, and through the media people were faced with daily high figures of human losses, overwhelmed healthcare services and horrifying images of mass graves. Thus, on the onset of the COVID-19 crisis when people felt especially threatened, they were deprived of the possibility to socially connect and feel safe with others, to receive care, support and compassion from others and also to connect, care and be compassionate to others in the face of suffering. Hence, this pandemic context might have represented a blockage to the enactment of compassionate motivational systems, and so the more socially connected and compassionate one was, the more vulnerable one felt (in relation to oneself and others), and the greater the traumatic stress associated with the pandemic. Similarly, Vasquez et al. (2020) found that beliefs of identification with humanity (which seems to be linked to a sense of common humanity related to compassion and social safeness) predicted both post-traumatic growth and post-traumatic symptoms at the beginning of the pandemic. Therefore, it seems that dimensions of social connection related to feeling socially safe and being able to give and receive compassion (from oneself and form others) may have double-edged consequences under the pandemic threat, by promoting growth and resilience, but also by increasing one’s sense of vulnerability and social loss. Are there other studies that suggest a dual role of compassion?

*Limitations and future directions*

As with any multinational study there may be differences across countries which can affect the results. In this case the differences in rates of COVID-19 and Government responses to the pandemic may affect variables such as psychological distress and the amount of social contact people receive in different countries. It is therefore reassuring that the results of this study were found to be consistent across countries. It is also important to note that convenience samples were used and, therefore, these are not representative of the countries’ populations. For example, more female participants consented to take part in the study, and there was no representation from the continent of Africa. Thus, in the future research should attempt to recruit more men and greater efforts should be made to collect data across all continents. Finally, the cross-sectional nature of the study prevents the establishment of causality, although the study is currently collecting longitudinal data throughout the pandemic. Future research will examine this longitudinal data and map the changes in post-trauamtic symptoms and post-traumatic growth as this global situation continues to develop.

Vasquez et al 2020

*Implications*

See our previous covid studies and Vasquez et al 2020

*Conclusion*

Historically social connection has been one of the main ways humans have coped with large-scale threatening events and disasters ~~pandemics~~.In the context of the COVID-19 pandemic, lockdowns have deprived people from one of the most powerful physiological and psychological regulators of threat – access to supportive social relationships. This multi-national study across 21 Countries revealed. Social connection (i.e., compassion and social safeness) increased the likelihood of post-traumatic growth in the context of the threat people felt during the pandemic. Howver, social connection also increased the likelihood of experiencing post-traumatic symptoms and this may be due to a physical loss of social connection (thorugh lockdowns) and fears for the safety of others during the pandemic. Social disconnection (i.e., fears of compassion and loneliness) magnified the impact of the perceived threat of COVID-19 on traumatic symptoms only. Future research should seek to map the relationship between social relating and post-traumatic growth and trauma symptoms as the pandemic situation continues to develop. Public health and Government organisations may want to consider the way they communicate measures such as ‘social distancing’ and ‘lockdowns’ to reduce the amount of social disconnection indicuals might experience as result of this messaging.

Furthermore, in line with our hypothesis, social disconnection significantly and positively moderated the impact of perceived threat of COVID-19 on post-traumatic stress. This is a key finding that indicates that in the pandemic context, fears of receiving (from oneself and others) and giving compassion and loneliness heighten the impact of perceived threat of COVID-19 on symptoms of post-traumatic stress, across all countries. Consistent with this, Matos et al. (2021) demonstrated that fears of compassion magnified the impact of perceived threat of COVID-19 on symptoms of depression, anxiety and stress, and that fears of receiving compassion from others amplified the negative effect of threat of COVID-19 on feelings of social safeness. Our data also extends previous studies on the mediating role of fears of compassion on the association between early emotional trauma and symptoms of depression, anxiety and paranoid ideation (Matos et al., 2017), and on loneliness as a major vulnerability factor in the context of trauma (REFS -look for interpersonal trauma studies).

after the onset of the crisis PTG might be an initial coping strategy that allows the development of longer-term outcomes such as the enduring positive changes in personality or in philosophical views of the world.

Kirsten: weird as this is positive and so is the reltionship with disconnesct but it might be because it’s blocked…you cant connect or care for others if in lockdown

It is a unique situation -you think of any other disaster, you come together with others, in this case, it's the opposite – its also a social trauma – people cannot come together – especially in the beginning of the pandemic. In the beginning it was also presented by authorities as a very high threat

In the start of the pandemic they are more shocked and threatened. Afterwards they found new ways of connecting with others. But at the time when the data was collected was at the very beginning

The more social connected/compassionate you were the more traumatic it is because who now lost it in the context of covid 19 and that makes it more traumatic – if you have greater connections before the lockdown then you have more to lose

Individuals who have social disconnection they lack an ability to socially engage

If you are socially disconnected then you already struggled with it

High fear of compassion is linked to posttraumatic growth in the positive domain – if you have

high fear of compassion you might be more afraid of giving it to others

It is a unique situation -you think of any other disaster, you come together with others, in this case, it's the opposite – its also a social trauma – people cannot come together – especially in the beginning of the pandemic. In the beginning it was also presented by authorities as a very high threat

In the start of the pandemic they are more shocked and threatened. Afterwards they found new ways of connecting with others. But at the time when the data was collected was at the very beginning

Individuals who have social disconnection they lack an ability to socially engage

The more social connected/compassionate you were the more traumatic it is because who now lost it in the context of covid 19 and that makes it more traumatic – if you have greater connections before the lockdown then you have more to lose

If you are socially disconnected then you already struggled with it

In the perceived threat has a bigger effect in trauma than in PTG

Compassion/positive component is more important for PTG

In the IES it's the fear of contraction that is more important /has more weight

Another point is that if you are afraid for the wellbeing of others, and you are on lockdown, then you cannot take care of them. If you were just afraid for yourself, you can do something about it.

The fear is less if you can act, if cannot do anything the fear goes up and up