



Partner responsiveness moderates the relation between COVID-19-related stressors and changes in mood during the pandemic

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Abstract

The COVID-19 pandemic has created an unusually stressful situation for many people around the world. Due to the restrictions, many have been isolated in their homes, and having a responsive partner may have become even more important. The present study aimed to investigate (1) whether there were any differences in social and work-related stressors and changes in negative mood during the COVID-19 pandemic as a function of marital status, and (2) whether perceived partner responsiveness can attenuate the associations between COVID-19-related stressors and changes in negative mood. The participants were 2,400 Brazilian adults recruited via the Internet, using a virtual sampling strategy. They were assigned to three distinct groups based on their relationship status. The results showed that a relatively large proportion of the sample reported increased levels of negative mood, and that married/cohabitating couples reported low levels of negative change in mood compared to single participants. We also found that partner responsiveness attenuated the association between stress and mental health, but only for people who were dating. Our study contributes new insights by showing that effects on mental health during the COVID-19 pandemic are dependent on relationship type and perceived partner responsiveness.

Keywords Relationships · COVID-19 · Mental health · Relationship quality · Single · Married

Previous research has shown that the COVID-19 pandemic has had severe negative effects on mental health (e.g., reviews by Rajkumar, 2020; Vindegaard & Benros, 2020; Xiong et al., 2020), but less is known about its effects on relationships. However, an association between stress and relationship decline during the pandemic has been found

(Goodwin et al., 2020), and people who experienced higher COVID-19-related stress have reported lower relationship satisfaction and more conflicts (Balzarini et al., 2020).

Although the studies mentioned above suggest problems in intimate relationships during the pandemic, it is important to note that married people have reported lower levels of stress compared to people who were not in a romantic relationship (Kowal et al., 2020). Thus, social support may act as a stress buffer in times of crisis (Dalgard et al., 1995; Feeney & Collins, 2015), most likely because social support is associated with better resilience and more positive outcomes with regard to mental health problems and related symptoms, recovery and functioning (Henry et al., 2019; Siedlecki et al., 2014; Sippel et al., 2015; Wang et al., 2018).

The COVID-19 pandemic has created an unusually stressful situation for many people around the world. Due to the restrictions, many have been isolated in their homes, and having a responsive partner may have become even more important. In line with this thinking, Balzarini et al. (2020) found that high partner responsiveness attenuated the associations between COVID-19-related stressors and relationship

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quality. However, mental health was not included as an outcome variable in their study, and we therefore do not know to what extent perceived partner responsiveness can also attenuate the association between COVID-19-related stressors and mental health. The overall aim of the present study was therefore to investigate the following research questions:

1. Are there group differences between married, dating and singles with regard to social and work-related stressors and changes in negative mood during the COVID-19 pandemic?
2. Are COVID-19-related stressors related to changes in negative mood during the pandemic and can perceived partner responsiveness attenuate these associations?

Methods

Participants and Procedures

Participants were 2,400 Brazilian adults recruited via the Internet, using a virtual sampling strategy (banner ad posted on the researchers' social media), and through articles published in local newspapers and radio programs. Participants were assigned to three distinct groups: 1) single group ($n = 376$), who were not in a romantic relationship of any kind, 2) dating group ($n = 835$), who were in a romantic relationship but did not live together, and 3) married group

($n = 1189$), who were married or cohabiting (see Table 1). Data were collected from June to September 2020.

Measures

Mood

Participants were asked to rate their current emotional state (i.e., previous 2 weeks) in relation to the following statements: "I feel sad," "I feel anxious," "I have a poor appetite," "I have sleeping problems (i.e., insomnia, oversleep)," "I feel angry," and "I feel lonely." Ratings were made on a scale ranging from 1 ("much less than before") to 5 ("much more than before"). Despite the relatively low number of items in this scale, the internal consistency was adequate ($\alpha = 0.80$).

Social and work-related changes

Participants indicated (yes/no) whether they had experienced changes due to the pandemic. With regard to social stressors, the statements were the following: 1) "I've been seeing my friends less often," 2) "I've been seeing my family less often," 3) "I've been seeing my partner less often," and 4) "I've been using digital media more often as a social interaction tool." Work-related stressors included the following: 1) "My workload has increased," and 2) "I lost my job". Previous research has shown that these are the most frequent social and work-related effects reported during the COVID-19 pandemic (Ammar et al., 2020;

Table 1 Results of ANOVAs comparing the three groups with regard to the background variables and ANCOVAs (controlling for age) examining group differences in social and work-related change

	Single (1) ($n = 376$)	Dating (2) ($n = 835$)	Married (3) ($n = 1189$)	Group comparison	Post hoc
Age	30.07 (11.14)	28.02 (8.784)	36.53 (9.13)	520.01***	2 < 1 < 3
Sex (% males)	133 (35.4%)	213 (25.5%)	331 (27.8%)	12.61**	1 > 2, 3
Education				243.13***	
Primary	9 (2.4%)	6 (0.7%)	14 (1.2%)		
Secondary	190 (50.5%)	375 (44.9%)	210 (17.7%)		1, 2 > 3
University	177 (47.1%)	454 (54.4%)	965 (81.2%)		3 > 1, 2
SES score	31.79 (9.82)	32.02 (10.04)	35.27 (8.617)	97.93***	3 > 1, 2
Social change					
See family less often	144 (38.3%)	403 (48.3%)	759 (63.8%)	94.65***	3 > 2 > 1
See friends less often	209 (55.6%)	538 (64.4%)	728 (61.2%)	8.62**	2 > 1
See partner less often	-	341 (40.8%)	26 (2.2%)	646.22***	2 > 3
Use social media more often	265 (70.5%)	562 (67.3%)	652 (54.8%)	47.03***	1, 2 > 3
Work-related change					
Increased workload	91 (24.2%)	252 (30.2%)	396 (33.3%)	11.33**	3 > 1
Unemployed	17 (4.5%)	49 (5.9%)	42 (3.5%)	6.23*	2 > 3
Mental health					
Mood	3.68 (0.81)	3.64 (0.71)	3.52 (0.72)	4.92**	1, 2 > 3
Responsiveness	-	4.13 (0.93)	3.71 (1.17)	597,199.5***	2 > 3

* $p < .05$, ** $p < .01$, *** $p < .001$

Agha, 2021; Craig & Churchill, 2021; Suka et al., 2021). The different stressors were not highly intercorrelated for either social stress (r s ranging between -0.06 and 0.40) and work-related stress ($r = -0.09$). We therefore analyzed these different stressors as separate measures.

Responsiveness

Participants' perceptions of their partners' responsiveness were assessed using a 3-item version of the Perceived Partner Responsiveness Scale (Reis et al., 2017). This version has previously been used by Maisel and Gable (2009) and it has been shown to have high reliability in both previous studies ($\alpha = 0.91$) and the present study ($\alpha = 0.90$). It includes the following statements: "I feel that my partner understands me," "My partner values my abilities and opinions," and "My partner makes me feel cared for." Ratings were made on a scale ranging from 1 ("completely disagree") to 5 ("completely agree").

Socioeconomic status

All participants answered questions about possession of durable goods and educational level of the head of the household, which provides evidence about purchasing power and general situation of the households. Scores can range from 0 to 100 and each individual is classified into one of six socioeconomic strata (ABEP, 2018).

Statistical Analyses

First, ANOVAs (dimensional variables) and chi-square analyses (categorical variables) were conducted to compare the three groups (i.e., married, dating and single) with regard to background variables, social and work-related change, and mood. In the ANOVAs, age and sex were used as covariates. Effect sizes were calculated using Cohen's d (Cohen, 1992), with $d < 0.30$ indicating a small effect, $d < 0.50$ indicating a medium-sized effect and $d < 0.80$ indicating a large effect. Next, hierarchical regression analyses were used to investigate associations between COVID-19-related stressors and mood and the moderating effect of partner responsiveness. Child age and sex was entered in the first step, the main effects of COVID-19-related stressors and partner responsiveness in the second step, and the interaction between responsiveness and COVID-19-related stressors in the third step. The PROCESS module (Hayes & Rockwood, 2017) was used to investigate moderation effects, and separate analyses were conducted for each of the five COVID-19-related stressors. Separate analyses were also carried out for the dating and married group.

Results

Regarding the negative changes in overall mood within the entire sample, a large proportion reported increased levels (i.e., a score of 4 or 5) of sadness (52.9%), anxiety (69.9%), problems with appetite (49.4%), sleeping problems (52.8%), anger (57.8%) and loneliness (47.1%) when comparing the current situation with the period prior to the pandemic. As shown in Table 1, there were significant group differences in all social stressors. For the item "seeing one's family less often", fewer individuals in the married group compared to the other two groups experienced this stressor. For the item "seeing friends less often," fewer individuals in the single group experienced this stressor compared to the dating group. For the item "using digital media more often as a social interaction tool", individuals in the single and dating groups increased their social media use more than the married group did. Concerning work-related stress, more individuals in the married group experienced increased workload compared to the single group, and more individuals in the dating group became unemployed due to the pandemic compared to individuals in the single group. The mean for perceived partner responsiveness was also higher in the dating group compared to the married group. Finally, the single and dating groups experienced a significantly larger increase in negative mood compared to the married group. However, it should be noted that all significant group differences were of small effect size (all d s < 0.20).

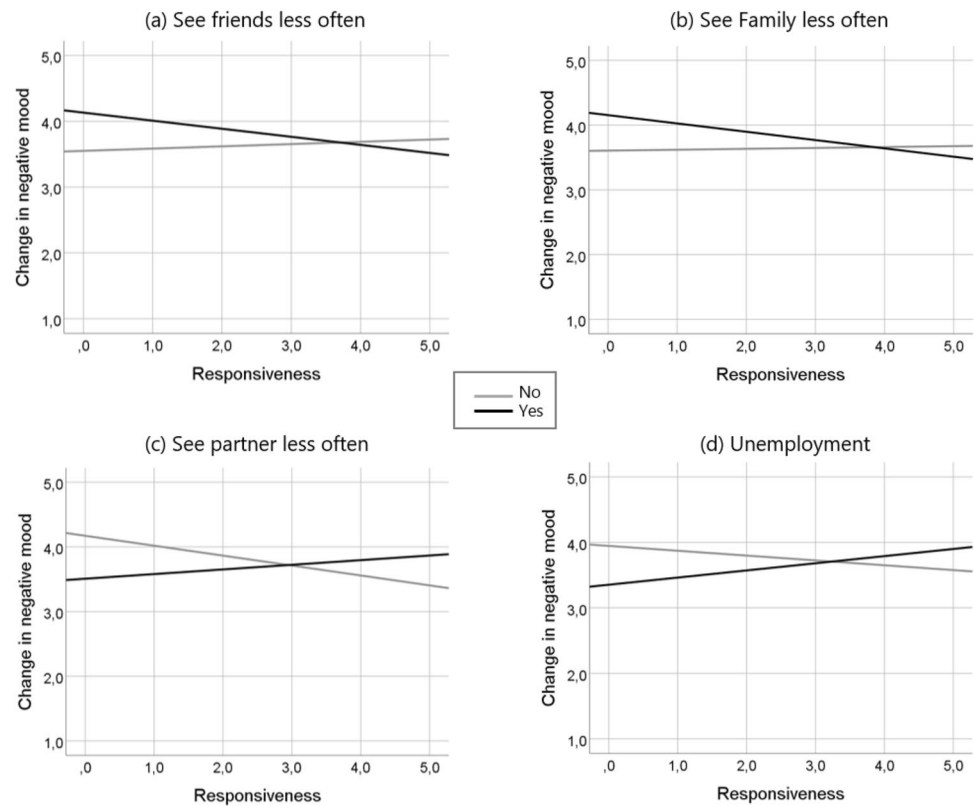
With regard to relations between COVID-19-related stressors and mood (Table 2), significant positive correlations were found with social media use for both the dating ($r = 0.11$, $p < 0.001$) and married group ($r = 0.07$, $p < 0.05$) and with seeing your partner less often for the dating group ($r = 0.21$, $p < 0.001$). Within the dating group, partner responsiveness moderated the relation between mood and seeing friends less often ($\beta = -0.06$, $p < 0.01$),

Table 2 Correlations between quality of the relationship (i.e., responsiveness and relationship satisfaction) and mood

	Mood	
	Married	Dating
Social stress		
Friends	.028	-.065
Family	.036	-.027
Partner	-	.209**
Social Media	.073*	.108**
Work-related stress		
Increased workload	.107**	.010
Unemployment	.047	.044

* $p < .05$, ** $p < .001$

Fig. 1 Graphs showing the four significant interaction effects



seeing family less often ($\beta = -0.05$, $p < 0.01$), seeing one's partner less often ($\beta = 0.07$, $p < 0.001$), and unemployment ($\beta = 0.06$, $p < 0.05$). More specifically, the results showed that individuals with a partner who was high in responsiveness showed the same change in negative mood regardless of whether that person saw friends (Fig. 1a) or family (Fig. 1b) less often. However, for individuals with a partner who was low in responsiveness, those who saw their friends or family less often showed a significantly higher negative change in mood compared to those who did not see friends or family less (Table 3).

Regarding seeing one's partner less often (Fig. 1c), this was associated with a greater increase in negative mood if the partner was high in responsiveness but with a positive outcome (i.e., smaller increase in negative mood) if the partner was low in responsiveness. For unemployment during the COVID-19 pandemic (Fig. 1d), the expected pattern was found for those with a partner who was high in responsiveness (i.e., greater negative increase in negative mood for those who entered unemployment compared to those who did not). However, for those with a partner who was low in responsiveness, becoming unemployed was associated with a smaller rather than greater increase in negative mood. The same moderating effects were not found in the married group (all β s < 0.02). In addition, partner responsiveness was not a significant moderator

for any of the relations between work-related stressors and mood in the married group (all β s < 0.03) or between social media and responsiveness in any of the groups (all β s < 0.03).

Discussion

The first aim of the present study was to examine whether there were group differences in social and work-related stressors due to the Covid-19 pandemic and changes in negative mood as a function of individuals' marital status. The results showed that a relatively large proportion of the sample reported increased levels of negative mood (i.e., increased sadness, anxiety, loneliness, problems with appetite, anger, and sleep problems). This is in line with previous research showing that many people have experienced increased levels of mental health problems during the COVID-19 pandemic, such as more depression and anxiety (Santabárbara et al., 2021; Xiong et al., 2020), and these types of symptoms have been shown to be associated with loneliness due to social-distancing measures (Horesh et al., 2020; Palgi et al., 2020).

Based on previous research showing that being in a romantic relationship could buffer against negative effects on mental health during times of difficulty (Pluut et al.,

Table 3 Results of the regression analyses

	Mood: married		Mood: dating	
	β	ΔR^2	β	ΔR^2
Step 1				
Age	.01	.01	-.13***	.03
Sex	.02***	.01	.12**	.03
Step 2A Seeing friends less often	.05	.10	-.05	.01
Responsiveness	-.32***		-.11**	
Step 2B Seeing family less often	.07*	.10	-.02	.01
Responsiveness	-.32***		-.11**	
Step 2C Seeing partner less often	-	-	.17***	.04
Responsiveness	-		-.10**	
Step 2D Social media more often	.06*	.10	.11***	.02
Responsiveness	-.32***		-.12***	
Step 2E Work-related stress – Increased workload	.09**	.11	.02	.01
Responsiveness	-.32***		-.11**	
Step 2F Work-related stress – Unemployment	.02	.10	.02	.01
Responsiveness	-.32***		-.11**	
Step 3				
A. Friends x Responsiveness	-.00	.00	-.06**	.01
B. Family x Responsiveness	.00	.00	-.05**	.01
C. Partner x Responsiveness	-	-	.07***	.01
D. Social Media x Responsiveness	.01	.00	.03	.00
E. Increased workload x Responsiveness	-.01	.00	.01	.00
F. Unemployment x Responsiveness	.02	.00	.06*	.00

* $p < .05$, ** $p < .01$, *** $p < .001$

2018; Dooley et al., 2018; Fredman et al., 2010), it could be hypothesized that effects on mental health would be the greatest for individuals who are single. However, the present results indicated that it is also important to make a distinction between dating and married/cohabitating couples, as it was only married/cohabitating couples who differed significantly from singles with regard to experiencing an increase in negative mood. This finding is in line with results from a few previous studies conducted during the COVID-19 pandemic, which found that being married/cohabitating predicted better mental health outcomes during the lockdown (Gualano et al., 2020; Stanton et al., 2020), while being in a relationship but not cohabitating was a risk factor for higher anxiety, stress and depression (Rodríguez-Rey et al., 2020), as well as poorer life satisfaction (Himawan et al., 2021). Due to the social isolation that was enforced during the pandemic, being in a relationship but not cohabitating has been similar to having a long-distance relationship (Rodríguez-Rey et al., 2020) and we know from previous research that having a long-distance relationship is related to greater stress (Du Bois et al., 2016).

The second aim was to investigate whether there was an association between COVID-19-related stressors and changes in negative mood and whether perceived partner responsiveness

would attenuate this association. To our knowledge, only one previous study has investigated the role of partner responsiveness during the COVID-19 pandemic, and this study showed that high partner responsiveness attenuated the associations between COVID-19-related stressors and relationship quality (Balzarini et al., 2020). Our results extend these findings by showing that partner responsiveness can also attenuate the association between stress and negative mood.

For the items “seeing friends less often” or “seeing family less often”, it was primarily among individuals with low partner responsiveness that these two social stressors resulted in a great change in negative mood. For individuals with a partner with low responsiveness, not seeing one’s partner as often as before was not a stressor at all, as these individuals reported a smaller increase in negative mood compare to those who saw their partner as often as before. Thus, our results suggest that being close to one’s partner during the pandemic could lower the negative impact of social stressors, as long as one feels understood, validated, and cared for by that partner. If not, closeness could even have the opposite effect.

Interestingly, significant interactions were only found for the dating group and not for those who were married/cohabitating. For the item “seeing one’s partner less often”, it was not surprising that this effect was only for

those who were dating, as very few (2%) of the married individuals saw their partner less often. For the other variables, the results are not as easily explained. One possible explanation is that individuals who were dating experienced a great increase in negative mood during the pandemic compared to the married group and, therefore, having a responsive partner was of more importance to this group.

Another issue that needs to be discussed is the significant moderation effect of partner responsiveness on the association between unemployment and negative mood. This moderation effect was in the opposite direction to that expected, as high responsiveness was related to a greater, not smaller, increase in negative mood for those who entered unemployment during the pandemic. However, the expected pattern (i.e., high responsiveness being related to a smaller increase in negative mood) was found for those who did not enter unemployment. We believe that the unexpected pattern of results found among those who entered unemployment might be related to the paradoxical effect of social support. A few previous studies have shown that receiving support is associated with an increase in negative mood, especially if it is unreciprocated (Liang et al., 2001; Maisel & Gable, 2009). Being unemployed is considered a major source of stress, which has been shown to be associated with negative mental health outcomes (for review, see Paul & Moser, 2009). More specifically, losing one's employment has been shown to have important negative effect on for example self-esteem and personal identity (Achdut & Refaeli, 2020; Clark et al., 2012). Although some research has shown that perceived responsiveness can moderate this effect (Maisel & Gable, 2009), it is possible that the burden of losing one's job due to the pandemic, combined with receiving a high level of support, could have a negative effect on the individual's self-efficacy (Gleason et al., 2008) that exceeds the positive effects of responsiveness. Another possible explanation is the fact that the unemployed group was very small (6% of the sample), which could have resulted in spurious findings.

Conclusions and Future Directions

Overall, our study provides support for the idea that perceived partner responsiveness can attenuate the effects of stress and helps explain which aspects may underlie the protective potential of responsiveness in a highly stressful context. However, our results should be considered along with some potential limitations. First, the present study is cross-sectional in nature, which means that neither causality nor the direction of the effects can be determined. It can also be considered a limitation that we used unstandardized instruments to evaluate mood, as well as social and work-related changes. However, as

the COVID-19 pandemic is a unique situation, it was not possible to find instruments that both captured the stressors of most importance for the pandemic and which asked about change over time. It was therefore necessary to create questions specifically adapted to the research questions of the present study. Finally, the survey was conducted online, and this type of data sampling often results in an underrepresentation of men (only 25–35% in our sample) and individuals with low education levels (47–81% have a university education). Thus, our sample was not totally representative of the entire Brazilian adult population. Nonetheless, this probably did not have a great effect on our findings, as the main aim was not to investigate the prevalence of problem behaviors but rather differences between groups and associations between variables.

In conclusion, our study contributes new insights by showing that effects on negative mood during the COVID-19 pandemic are dependent on relationship type and perceived partner responsiveness. However, in our view, it is important for future research to investigate other relationship factors, such as intimate partner violence and coping strategies, as well as to what extent single individuals chose not to have a partner since this may impact mental health outcomes (Adamczyk, 2017). Furthermore, it would be interesting also to examine more long-term effects of perceived partner responsiveness on negative mood and other mental health problems related to the COVID-19 pandemic.

Author Contributions All authors contributed to the study conception and design. Material preparation and data collection and analysis were performed by Lorryne Stephane Soares. The first draft of the manuscript was written by Lorryne Stephane Soares and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

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Data Availability Not applicable.

Code Availability Not applicable.

Declarations

Conflicts of Interest/Competing Interests The authors declare that they have no conflict of interest.

Ethics Approval The study was approved by the local ethics board (registry: CAAE 59792816.8.0000.5134). The study is in accordance with the Declaration of Helsinki.

Consent to Participate All the volunteers consented for participation.

Consent for Publication Not applicable.

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