Relationship Functioning during COVID-19 Quarantines

**Partners' Attachment Insecurity and Stress Predict
Poorer Relationship Functioning during COVID-19 Quarantines**

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Abstract

The COVID-19 pandemic presents acute, ongoing relationship challenges. The current research tested how (1) pre-existing vulnerabilities assessed prior to the pandemic (attachment insecurity) and (2) stress as couples endured a mandated quarantine predicted residual changes in relationship functioning. Controlling for pre-quarantine problems, relationship quality and family environment, greater partners' attachment anxiety predicted greater relationship problems, lower relationship quality, and a less stable and cohesive family environment when people were experiencing more stress. Greater partners' attachment avoidance predicted lower problem solving efficacy and family cohesion. The effects of partners' pre-existing vulnerabilities and pandemic-related stress demonstrate the utility of key models in relationship science in identifying who is at most risk of relationship problems in the unprecedented context of a mandated quarantine. The results emphasize that the effects of the COVID-19 pandemic on relationship functioning will be shaped by the characteristics of partners with whom people are confined with during the pandemic.

Keywords: COVID-19 quarantine, attachment insecurity, stress, relationship problems, partner effects

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High quality relationships protect health and well-being during challenging life events (Pietromonaco & Collins, 2017). Maintaining close relationships is thus crucial as couples face the challenges of the COVID-19 pandemic. Quarantines to contain COVID-19 require couples to balance work and full-time childcare isolated from social resources that would help alleviate these burdens. The resulting anxiety, economic insecurity and social loss make it difficult to sustain high quality relationships, especially for couples entering the pandemic with vulnerabilities that put them at greater risk (Pietromonaco & Overall, 2020).

According to the Vulnerability-Stress-Adaption (VSA) model (Karney & Bradbury, 1995), enduring *vulnerabilities*, such as traits or dispositions, along with the *stress* of acute demands strain adaptive processes that are needed to sustain healthy relationship functioning. Integrating the VSA model with diathesis-stress models of attachment (Simpson & Rholes, 2012, 2017), Pietromonaco and Overall (2020) suggested attachment insecurity would be particularly important in determining adaptation to the stress arising from the pandemic. Attachment insecurity is one of the most studied personal vulnerabilities that reliably predicts poorer relationship quality (Joel et al., 2020). Moreover, a bulk of evidence demonstrates that attachment insecurity creates problematic dynamics during times of stress that damage relationship functioning (Mikulincer & Shaver, 2007; Simpson & Rholes, 2012, 2017).

In the current research, we applied and extended the integration by Pietromonaco and Overall (2020) to test whether individuals' own and their partner's attachment insecurity represent key pre-existing vulnerabilities that, combined with stress experienced across life domains (e.g., economic, work, health), hindered couples ability to adapt to the challenges of a mandated quarantine with their children (see Figure 1). Couples who had completed assessments of attachment insecurity and relationship functioning *prior* to the COVID-19 pandemic completed assessments of their stress and relationship functioning *during* a mandatory COVID-19 quarantine. This longitudinal design allowed us to test whether individuals' and partners' attachment insecurity (Path V) and stress during quarantine (Path S) predicted residual changes in relationship functioning, including increasing the risk of relationship problems, undermining couples' ability to provide a stable and cohesive family environment, and lowering relationship quality (see Figure 1).

Enduring Vulnerabilities: Own and Partner Attachment Insecurity

Attachment anxiety is theorized to arise from inconsistent past caregiving that promotes persistent bids for closeness fueled by fears that partners will be unresponsive or rejecting (Mikulincer & Shaver, 2003). These fears often create intense distress, destructive reactions to threatening events, and excessive reassurance seeking (Campbell et al., 2005; Jayamaha et al., 2017; Overall et al., 2014; Simpson et al., 1996). Such reactions are linked to multiple relationship problems (e.g., poorer communication, unrealistic expectations, poorer felt regard/love, jealousy), lower problem resolution, and poorer relationship quality (Campbell et al., 2005; Jayamaha et al., 2017; Overall et al., 2014; Simpson et al., 1996).

Attachment avoidance is theorized to arise from neglectful past caregiving that generates deep-seated beliefs that partners cannot be trusted to be responsive (Mikulincer & Shaver, 2003). Such distrust often prompts avoidant individuals to limit closeness (Pietromonaco & Barrett, 1997; Tan et al., 2012), suppress distress and reject support (Girme et al., 2015; Simpson et al., 1992), withdraw when their partner needs support (Simpson et al., 2002), and be more unresponsive, withdrawn or hostile during conflict (Beck et al., 2014; Overall et al., 2013, 2015; Simpson et al., 1996). These distancing strategies can produce various problems (e.g., lack of closeness/support, poorer communication, power struggles), impede problem resolution, and reduce relationship quality (e.g., Overall et al., 2013, 2015; Tan et al., 2012).

The typical reactions to stressful events by people higher in anxiety or avoidance are likely to disrupt relationship functioning during the COVID-19 pandemic. Moreover, because partners' attachment insecurity creates an array of problems for individuals, the risk to relationship functioning is likely to involve partner effects (partners' insecurities predicting individuals' relationship functioning) in addition to actor effects (individuals' insecurities predicting individuals' functioning). Individuals with highly anxious partners face intense negative emotions, excessive reassurance seeking, and destructive responses during challenging contexts. Accordingly, individuals with highly anxious partners find it more difficult to be responsive during conflict (Beck et al., 2013; Overall et al., 2015), are less able to improve relationship problems (Jayamaha et al., 2016) or get support from their partner (Jayamaha et al., 2017), and consequently report lower satisfaction and commitment (Butzer & Campbell, 2008; Carnelley et al., 1996; Overall et al., 2015). Similarly, individuals with highly avoidant partners must contend with their partners' distancing strategies that reduce intimacy and support (Girme et al., 2015; Simpson et al., 2002, 2007), create more hostile, dissatisfying and unsuccessful problem solving interactions (Beck et al., 2013; Overall et al., 2013, 2015), and lower satisfaction and commitment (Butzer & Campbell, 2008; Carnelley et al., 1996; Tan et al., 2012). Accordingly, partners' attachment insecurity is likely to hinder adaptation to COVID-19 quarantines and predict poorer relationship functioning.

External Stress and Vulnerability X Stress Interaction Effects

Ample research illustrates that stress heightens the risk of relationship problems and dissatisfaction (Neff & Karney, 2017). People who face greater stress are more disconnected and withdrawn, and less affectionate and intimate with their partners (Bodenmann et al., 2007; Repetti et al., 2009; Story & Repetti, 2006), which predicts poorer closeness, support, and relationship quality (Falconier et al., 2015; Neff & Karney, 2004; Randall & Bodenmann, 2009). Second, managing external stress depletes the energy and resources needed for people to effectively manage relationship problems (Buck & Neff, 2012). The more people are facing stressful events, the more they behave in blaming, critical and hostile ways (Barton & Bryant, 2016; Barton et al., 2015; Bodenmann et al., 2015; Masarik et al., 2016; Neff & Karney, 2004, 2009; Williamson et al., 2013), which in turn predicts declines in relationship quality (Barton et al., 2015; Neff & Karney, 2004; Nguyen et al., 2020). Thus, people facing greater stress during COVID-19 quarantines should experience greater relationship problems,

Figure 1. Application of the Vulnerability-Stress-Adaptation Model (Karney & Bradbury, 1995) and Diathesis-Stress Model of Attachment (Simpson & Rholes, 2012, 2017) to Relationship Functioning during a Mandatory COVID-19 Quarantine

Note. Variables in dashed line boxes were assessed prior to the COVID-19 pandemic. Variables in solid line boxes were assessed when couples were living together in a nationwide lockdown involving mandated quarantine to prevent the spread of COVID-19.

more difficulties navigating the challenges of home life during quarantine, and poorer relationship quality (Figure 1, Path S).

Studies inspired by the VSA model also indicate that vulnerabilities and stress may interact to predict relationship functioning (McNulty, 2016). Potential interactions between personal vulnerabilities and external stress align with diathesis-stress perspectives of attachment insecurity, which emphasize that the affect regulation strategies associated with attachment anxiety and avoidance occur within stressful contexts that activate underlying attachment concerns (Simpson & Rholes, 2012, 2017). Diathesis-stress (or vulnerability-stress) interactions are supported by evidence that the detrimental effects of anxiety and avoidance emerge most strongly in challenging contexts that produce distress or threaten relationship bonds (e.g., Overall et al., 2014, 2015; Pietromonaco & Barrett, 1997; Simpson et al., 1992, 1996, 2002). Thus, individuals' own and their partners' attachment insecurity may interact with external stress (Figure 1, Path X), such that any damage to relationship functioning will be most likely to occur when attachment insecurity *and* stress are higher.

Relationship Functioning during Quarantine

To test whether pre-existing vulnerabilities and stress predicted poorer relationship functioning during quarantine, we analyzed three categories of outcomes (a) that broadly capture the relationship difficulties shown to arise from attachment insecurity and stress, (b) are relevant to the relationship demands of COVID-19 quarantines, and (c) that we had equivalent pre-quarantine assessments (see Figure 1).¹

Relationship Problems. As outlined above, attachment insecurity and stress often damage relationships by creating a range of problematic dynamics and impeding problem resolution (see Neff & Karney, 2017; Overall & Simpson, 2015). Accordingly, we assessed the (1) severity of an array of problems commonly experienced in relationships and often linked to insecurity and stress (e.g., poor communication, power struggles, love/intimacy, unrealistic expectations) and (2) perceived ability (efficacy) to resolve relationship problems.

Family Environment. Extending prior VSA and attachment investigations, we also assessed outcomes essential to the challenge of the quarantine for couples with children—sustaining a stable and cohesive home environment (Farrell & Barnes, 1993; Marsh et al., 2020). Couples with more problems are less able to facilitate cohesive, connected family interactions and report more chaotic, unstable home environments across time (Cross et al., 2020; Low et al., 2019). These disruptions underpin the risks that the pandemic poses to children's health/well-being (Prime et al., 2020). Thus, home chaos and family cohesion are important indicators of whether couples are able to navigate the challenges of the quarantine in order to provide a stable and supportive family environment that is essential to their own and their children's health and well-being (Farrell & Barnes, 1993; Marsh et al., 2020).

Relationship Quality. The VSA (Karney & Bradbury, 1995) and diathesis-stress attachment (Simpson & Rholes, 2012, 2017; Overall & Simpson, 2015) models equally

¹ Our original analysis focused on problem severity and relationship quality. We then examined the additional indicators of relationship functioning for which we had equivalent pre-quarantine assessments (summarized in Figure 1), which revealed consistent and new effects.

emphasize that difficulties adapting to stressful contexts, as indicated by greater problems and failure to cultivate supportive family environments, will undermine relationship quality. We assessed satisfaction and commitment, which are central, widely-used indicators of relationship quality (Fletcher et al., 2000; Joel et al., 2020; Rusbult et al., 1998).

Overview of Current Research

Integrating two central models in relationship science, the current study investigated how (1) pre-existing enduring vulnerabilities (own and partner attachment insecurity) and (2) stress experienced during a COVID-19 quarantine predicted residual changes in relationship functioning. Figure 1 summarizes the design and primary measures. The dashed lines specify variables collected prior to the COVID-19 pandemic (attachment insecurity and relationship functioning). The solid lines specify variables collected when couples were living together during a nationwide lockdown in New Zealand (NZ) involving mandatory and enforced quarantine in the home for 5 weeks (stress and relationship functioning during quarantine). Collecting outcomes prior to and during the COVID-19 quarantine enabled us to test how (1) own and partners' attachment insecurity assessed prior to the pandemic (Path V) and (2) the stress experienced during quarantine (Path S) predicted residual changes across an array of indicators of relationship functioning, including greater relationship problems, reduced ability to provide a stable cohesive family environment in the home, and lower relationship quality.

Method

Participants

Sample size was determined by the pool of couples ($N = 234$) who had participated in a study prior to the COVID-19 pandemic. Couples were emailed an invitation to complete an additional questionnaire during the Level 4 Lockdown in NZ (March 26 to April 28, 2020) in which all families were legally required to stay within their immediate household with no physical contact outside the home with the exception of one person occasionally gathering essential resources (medicine, groceries). The questionnaire was open for the last 3 weeks of the quarantine period (April 8 to 27, 2020). Couples received \$NZ50 for participating. Of the 234 couples, 157 opposite-sex couples (314 individuals) provided complete data. Couples were in long-term ($M = 12.00$, $SD = 4.65$) relationships (87% married) with children ($M = 2.26$, $SD = .87$). See Table 1.

People who did not complete the quarantine assessment were higher in attachment avoidance and problem severity, and involved in shorter relationships, at the pre-pandemic assessment. Post-hoc power estimation for the smallest significant partner effects was .724 and .831. See Online Supplemental Material (OSM) for more detail regarding the pre-quarantine sample, attrition, quarantine conditions, and power.

Procedure and Materials

Couples had completed measures of attachment insecurity and relationship functioning on average a year prior to the quarantine assessment ($M = 346$ days, $SD = 184$; range = 25-679). Controlling for days between initial and quarantine assessments did not alter the results. During the quarantine, participants completed the same measures of relationship

functioning along with a measure of stress. The quarantine assessment was completed, on average, 20 days ($SD = 4$; range 14-33) into the mandatory lockdown.

Table 1. Demographic Information for Women (N = 157) and Men (N = 157)

Demographic Variables	Women		Men	
	<i>Mean (SD)</i>	<i>Frequency</i>	<i>Mean (SD)</i>	<i>Frequency</i>
Age	36.20 (4.63)		38.04 (5.38)	
Ethnicity				
New Zealand Māori		5.7%		4.5%
Pacific Nations		2.5%		7.0%
Indian		4.5%		3.8%
Asian		12.7%		10.2%
Non-NZ European		14.6%		12.1%
New Zealand European/Pākehā		55.4%		58.6%
Other Ethnicity not listed		4.5%		3.8%
Education				
Postgraduate (e.g., Postgraduate Diploma, Honours degree, Masters degree)		39.5%		26.1%
Tertiary (e.g., College/University Degree, Technical Qualification, Trade Certificate)		47.1%		49.0%
High School Certificate		10.2%		20.4%
Income (NZD per annum) Prior to Quarantine				
< 40,000		46.5%		7.0%
41-60,000		12.7%		12.7%
61-80,000		12.7%		20.4%
81-100,000		11.5%		21.7%
> 100,000		15.9%		38.2%
Income (NZD per annum) During the Quarantine				
< 40,000		51.6%		19.7%
41-60,000		12.1%		12.1%
61-80,000		12.7%		18.5%
81-100,000		10.8%		20.4%
> 100,000		12.1%		29.3%

Note. Age, number of children, relationship length and marital status reflect demographics at the initial session. Thirty-two percent of participants lost work (N=100; 44 women, 56 men) and 34% of participants (N = 108; 46 women, 62 men) lost income due to the quarantine, which is evident in changes in income groups prior to and during the quarantine.

Measures

All measures are established, reliable scales. Items were averaged to construct scale scores (α s ranged from .78 to .95). See OSM for further details. Table 2 displays descriptive statistics.

Attachment Insecurity. At the pre-quarantine assessment, participants completed the *Adult Attachment Questionnaire* (Simpson et al., 1996). Nine items assessed attachment anxiety (e.g., “I often worry that my romantic partners don’t really love me”; 1 = *strongly disagree*, 7 = *strongly agree*). Eight items assessed attachment avoidance (e.g., “I’m somewhat uncomfortable being too close to my romantic partners”).

Stress during Quarantine. During the quarantine, participants rated how stressful 12 life domains had been during the quarantine (e.g., “living conditions”, “financial status”, “work”; 1 = *not at all stressful*, 7 = *extremely stressful*).²

Table 2. Descriptive statistics for Measures Prior To and During Quarantine for Women (N = 157) and Men (N = 157)

Measures	Prior to Quarantine		During Quarantine**	
	Women	Men	Women	Men
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Attachment Anxiety	2.74 (1.04)	2.84 (1.07)		
Attachment Avoidance	2.59 (0.95)	2.38 (0.80)		
Problem Severity	2.36 (0.83)	2.43 (0.75)	2.01 (0.81)	2.06 (0.83)
Problem Solving Efficacy	5.40 (1.30)	5.26 (1.15)	5.99 (1.28)	5.84 (1.14)
Home Chaos	3.10 (0.95)	3.34 (0.95)	3.11 (1.08)	3.21 (0.97)
Family Cohesion	6.14 (0.87)	5.98 (0.92)	5.98 (1.03)	5.74 (1.10)
Relationship Satisfaction	5.63 (1.06)	5.45 (1.24)	5.53 (1.30)	5.41 (1.35)
Relationship Commitment	6.76 (0.53)	6.69 (0.64)	6.63 (0.78)	6.62 (0.67)
Stress during Quarantine			2.74 (0.94)	2.55 (1.01)

Note. All variables were measured on 1-7 scales. **Relationship satisfaction and commitment prior to and during the quarantine are directly comparable. However, pre-quarantines levels of relationship problems, problem solving efficacy, home chaos and family cohesion captured general experiences whereas the quarantine levels of these variables were specific to experiences *during* quarantine. Nonetheless, analyses controlling for each indicator of relationship functioning prior to the quarantine provides evidence that any effects of individuals’ and partners’ pre-existing attachment insecurity (assessed prior to the pandemic) on relationship functioning during quarantine reflect relative residual changes from general pre-quarantine levels.

² We removed the item “relationship with your spouse” to capture stress external to the relationship and reduce overlap with relationship functioning measures (Neff & Broady, 2011), and removed 7 items from the problem severity measure to reduce overlap with life domains in the stress measure (Neff & Karney, 2004; see OSM). The stress measure also includes parenting stress, which we did not remove because the family environment measures do not specifically refer to parenting; removing parenting items produced the same results (see OSM).

Relationship Functioning. Participants completed all measures prior to *and* during the quarantine. In pre-quarantine assessments, participants rated general experiences of relationship problems and family environment. In quarantine assessments, participants rated experiences specific to the quarantine (see OSM and Table 2).

Relationship Problems. Participants rated the severity of 20 relationship problems (e.g., communication, showing affection; 1 = *not a major problem*, 7 = *major problem*; Geiss & O’Leary, 1981) and four items assessing problem resolution efficacy (e.g., “there has been no way that I could solve some of the problems in our relationship” [reverse-scored]; 1 = *strongly disagree*, 7 = *strongly agree*; Fincham et al., 2000).

Family Environment. Participants rated 12 items assessing home chaos (e.g., “there often has been a fuss going on at our home”, “we are usually able to stay on top of things” [reverse-scored]; 1 = *not at all like your home*, 7 = *very much like your home*; Matheny et al., 1995) and family cohesion (e.g., we have ... “felt a sense of togetherness”, “supported and helped one another”; 1 = *strongly disagree*, 7 = *strongly agree*; Moos & Moos, 1981).

Relationship Quality. Participants completed items from Rusbult and colleagues’ (1998) investment scale to assess relationship satisfaction (e.g., “I feel satisfied with our relationship”) and commitment (e.g., “I want our relationship to last a very long time”).

Results

The indicators of relationship functioning were correlated in expected directions (see Table 3). We ran analyses predicting each outcome separately for transparency and because the constructs are theoretically and empirically distinct in prior work and have differential relevance to the literatures we integrate (see OSM). Using the MIXED procedure in SPSS 26, we applied the dyadic regression procedures outlined by Kenny et al. (2006), which treats individuals’ scores as repeated measures within the dyad and accounts for nonindependence by modeling a *heterogeneous compound symmetry* error structure.

Given the number of parameters required for assessing actor and partner effects of attachment insecurity (modelling individuals’ own *and* partners’ anxiety *and* avoidance) we present two models. Model 1 tests the main effects of attachment insecurity (Path V) and stress (Path S, Figure 1). Each measure of relationship functioning during quarantine was modelled as a function of relationship functioning prior to the pandemic (so that any significant effects represent prediction of residual change), own and partners’ attachment anxiety, own and partners’ attachment avoidance, and stress. Model 2 added the Own Anxiety X Stress, Partners’ Anxiety X Stress, Own Avoidance X Stress, and Partners’ Avoidance X Stress, interactions to test whether any damage to relationship functioning was greater when individuals’ or partners’ attachment insecurity *and* stress were higher (Figure 1, Path X). See OSM for annotated syntax. Data and analytic code are available here: <https://osf.io/8wtxd/>.

Relationship Problems During Quarantine. As shown in Table 4, Model 1 testing the main effects revealed that partners’ attachment anxiety predicted greater problems and partners’ attachment avoidance predicted lower problem solving efficacy (controlling for severity/efficacy prior to the quarantine). In addition to main effects of stress on relationship

problems, Model 2 testing the interaction effects revealed that both actor and partner attachment anxiety interacted with stress to predict problem severity (bold interactions in Table 4). Figure 2 decomposes the significant interactions by plotting the predicted values at low (-1SD) and high (+1SD) levels of attachment anxiety and stress. Individuals high in attachment anxiety (Panel A) reported greater problem severity when experiencing high stress (solid slope = .157, 95% CI [.055, .259], $t = 3.11$, $p = .003$), but not low stress (dashed slope = -.013, 95% CI [-.121, .095], $t = -.23$, $p = .817$). Moreover, individuals with partners high in attachment anxiety (Panel A) reported greater problem severity when experiencing high stress (solid slope = .188, 95% CI [.082, .294], $t = 3.52$, $p = .001$), but not low stress (dashed slope = -.009, 95% CI [-.115, .097], $t = -.16$, $p = .873$).

Family Environment During Quarantine. As shown in Table 5, Model 1 testing the main effects revealed that partners' attachment avoidance predicted lower family cohesion and greater stress predicted greater home chaos and lower cohesion. In Model 2 testing the interaction effects, significant interactions emerged between partners' attachment anxiety and stress predicting both home chaos and family cohesion. As shown in Figure 3, individuals with partners higher in attachment anxiety (Panel A) reported greater home chaos when they experienced high stress (solid slope = .195, 95% CI [.069, .321], $t = 3.09$, $p = .002$), but not low stress (dashed slope = -.088, 95% CI [-.212, .036], $t = -1.41$, $p = .162$). Partners' greater attachment anxiety (Panel B) also predicted poorer family cohesion when experiencing high stress (solid slope = -.158, 95% CI [-.303, .012], $t = -2.16$, $p = .032$). Unexpectedly, partners' attachment anxiety predicted greater family cohesion when experiencing low stress (dashed slope = .174, 95% CI [.026, .322], $t = 2.35$, $p = .020$), but this effect was not evident when examining the other five outcomes.

Relationship Quality during Quarantine. As shown in Table 6, partners' attachment anxiety predicted lower satisfaction and commitment (Model 1). Although greater stress predicted lower satisfaction, there were no significant interactions between attachment insecurity and stress (Model 2).

Table 3. Correlations Across All Measures Prior to the Quarantine (PQ) and During the Quarantine (DQ) for Women (above the diagonal) and Men (below the diagonal).

Measures	1.	2.	3.	4	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.
1. PQ Attachment Anxiety	-	.46**	.18*	.11	.37**	-.27**	.18*	-.23**	-.25**	-.09	.20*	-.11	.10	-.12	-.14	-.04	.19*
2. PQ Attachment Avoidance	.33**	-	.38**	.18*	.52**	-.46**	.24**	-.32**	-.45**	-.36**	.23**	-.23**	.18*	-.17*	-.24**	-.20*	.16
3. PQ Partners' Attachment Anxiety	.18*	.11	-	.33**	.36**	-.40**	.06	-.27**	-.39**	-.26**	.29**	-.30**	.10	-.18*	-.35**	-.33**	.01
4. PQ Partners' Attachment Avoidance	.38**	.18*	.46**	-	.13	-.07	.04	-.08	-.14	-.09	.07	-.09	.11	-.26*	-.14	-.08	.08
5. PQ Problem Severity	.59**	.30**	.24**	.35**	.59**	-.67**	.37**	-.51**	-.67**	-.46**	.48**	-.40**	.19*	-.24**	-.46**	-.38**	.12
6. PQ Problem Solving Efficacy	-.52**	-.32**	-.17*	-.32**	-.71**	.44**	-.27**	.47**	.63**	.49**	-.44**	.45**	-.15	.29**	.49**	.47**	-.13
7. PQ Home Chaos	.26**	.22*	.10	.21**	.53**	-.40**	.48**	-.47**	-.37**	-.30**	.40**	-.29**	.59**	-.42**	-.24**	-.20*	.32**
8. PQ Family Cohesion	-.34**	-.32**	-.19*	-.25**	-.63**	.48**	-.45**	.37**	.57**	.47**	-.47**	.40**	-.23**	.49**	.54**	.48**	-.12
9. PQ Relationship Satisfaction	-.45**	-.21**	-.20*	-.36**	-.64**	.49**	-.46**	.55**	.61**	.64**	-.57**	.44**	-.25*	.34**	.65**	.53**	-.13
10. PQ Relationship Commitment	-.17*	-.18*	-.31**	-.39**	-.34**	.24**	-.21**	.31**	.64**	.45**	-.47**	.45**	-.18*	.27**	.48**	.65**	-.10
11. DQ Problem Severity	.48**	.27**	.20*	.26**	.60**	-.36**	.39**	-.49**	-.54**	-.30**	.43**	-.75**	.41**	-.51**	-.75**	-.70**	.36**
12. DQ Problem Solving Efficacy	-.38**	-.22**	-.23**	-.38**	-.49**	.48**	-.28**	.50**	.49**	.39**	-.68**	.39**	-.34**	.40**	.62**	.64**	-.14
13. DQ Home Chaos	.29**	.23**	.13	.19*	.42**	-.33**	.62**	-.37**	-.39**	-.21**	.55**	-.44**	.42**	-.65**	-.28**	-.18*	.52**
14. DQ Family Cohesion	-.37**	-.26**	-.17*	-.27**	-.47**	.31**	-.41**	.56**	.50**	.30**	-.60**	.50**	-.61**	.36**	.49**	.31**	-.38**
15. DQ Relationship Satisfaction	-.47**	-.20*	-.24**	-.37**	-.63**	.42**	-.41**	.58**	.78**	.46**	-.79**	.67**	-.47**	.66**	.56**	.69**	-.20*
16. DQ Relationship Commitment	-.30**	-.25**	-.20*	-.28**	-.43**	.31**	-.30**	.47**	.47**	.41**	-.56**	.59**	-.33**	.43**	.66**	.35**	-.13
17. DQ Stress During Quarantine	.22*	.26**	.00	-.01	.29**	-.18*	.24**	-.22**	-.17*	-.05	.50**	-.35**	.41**	-.31**	-.30*	-.13	.15

Note. PQ = Prior to Quarantine. DQ = During Quarantine. Correlations for women (N = 157) are shown above the diagonal. Correlations for men (N = 157) are shown below the diagonal. Bold correlations on the diagonal represent correlations across dyad members. Correlations across dyad members for attachment insecurity are shown in the top quadrant (i.e., associations across actor and partner attachment anxiety and avoidance). * $p < .05$. ** $p < .01$.

Table 4. The Effects of Own and Partners' Attachment Insecurity Assessed Prior to the Quarantine and Stress During the Quarantine on Relationship Problems

Predictors	Problem Severity						Problem Solving Efficacy					
	<i>B</i>	CI <i>Low</i>	CI <i>High</i>	<i>t</i>	<i>p</i>	<i>r</i>	<i>B</i>	CI <i>Low</i>	CI <i>High</i>	<i>t</i>	<i>p</i>	<i>r</i>
<i>Model 1: Main Effects</i>												
Pre-Quarantine Severity/Efficacy	.41	.30	.52	7.15	<.001	.39	.36	.25	.47	6.46	<.001	.35
Own Attachment Anxiety	.08	-.01	.16	1.86	.064	.11	-.03	-.15	.10	-.43	.670	.03
Partners' Attachment Anxiety	.09	.02	.17	2.36	.019	.14	-.12	-.24	.00	-1.93	.055	.12
Own Attachment Avoidance	-.06	-.15	.04	-1.20	.233	.07	.02	-.13	.17	.26	.795	.02
Partners' Attachment Avoidance	.02	-.07	.11	.39	.700	.02	-.19	-.33	-.05	-2.62	.009	.16
Stress during Quarantine	.29	.22	.36	7.87	<.001	.42	-.23	-.35	-.11	-3.74	<.001	.22
<i>Model 2: Interaction Effects</i>												
Pre-Quarantine Severity/Efficacy	.42	.31	.53	7.35	<.001	.40	.37	.25	.48	6.49	<.001	.35
Own Attachment Anxiety	.07	-.01	.15	1.79	.074	.11	-.03	-.15	.10	-.41	.686	.02
Partners' Attachment Anxiety	.09	.02	.16	2.39	.018	.14	-.12	-.24	.00	-1.95	.052	.12
Own Attachment Avoidance	-.05	-.14	.04	-1.03	.304	.06	.02	-.13	.17	.27	.786	.02
Partners' Attachment Avoidance	.03	-.06	.12	.64	.526	.04	-.19	-.34	-.05	-2.65	.009	.16
Stress during Quarantine	.29	.22	.37	8.07	<.001	.43	-.22	-.34	-.10	-3.64	<.001	.21
Own Attachment Anxiety X Stress	.09	.02	.15	2.54	.012	.16	-.05	-.16	.06	-.86	.388	.06
Partners' Attachment Anxiety X Stress	.10	.02	.18	2.60	.010	.16	-.02	-.15	.11	-.32	.749	.02
Own Attachment Avoidance X Stress	-.02	-.09	.06	-.44	.663	.03	-.04	-.17	.09	-.54	.589	.03
Partners' Attachment Avoidance X Stress	-.01	-.09	.07	-.29	.770	.02	.01	-.13	.14	.09	.933	.01

Note. Significant effects of attachment insecurity and stress are presented in bold. Approximate effect sizes r were computed using Rosenthal and Rosnow's (2007) formula: $r = \sqrt{(t^2 / t^2 + df)}$. In these multilevel models, the Satterthwaite approximation is applied to provide specific degrees of freedom for each effect representing the weighted average of the dyad- and individual-level degrees of freedom, which were used to calculate the effect sizes. Degrees of freedom ranged from 270.35-301.81 in Model 1 analyses and 236.45-298.00 in Model 2 analyses. * $p < .05$. ** $p < .01$.

A: Actor Attachment Anxiety and Problem Severity

B: Partner Attachment Anxiety and Problem Severity

Figure 2. *The Interaction Effects of Individuals' Own Attachment Anxiety and Stress (Panel A) and Partners' Attachment Anxiety and Stress (Panel B) on Relationship Problems Experienced during the COVID-19 Quarantine.*

Note. Analyses control for problem severity prior to the COVID-19 pandemic. High and low levels are plotted at 1 SD above and below the mean.

Table 5. The Effects of Own and Partners' Attachment Insecurity Assessed Prior to the Quarantine and Stress During the Quarantine on Family Environment

Predictors	Home Chaos						Family Cohesion					
	<i>B</i>	CI <i>Low</i>	CI <i>High</i>	<i>t</i>	<i>p</i>	<i>r</i>	<i>B</i>	CI <i>Low</i>	CI <i>High</i>	<i>t</i>	<i>p</i>	<i>r</i>
<i>Model 1: Main Effects</i>												
Pre-Quarantine Chaos/Cohesion	.53	.44	.62	11.09	<.001	.54	.53	.42	.65	9.02	<.001	.46
Own Attachment Anxiety	.00	-.09	.09	.02	.984	.00	-.04	-.14	.06	-.74	.462	.04
Partners' Attachment Anxiety	.05	-.04	.14	1.10	.270	.07	.01	-.10	.11	.10	.925	.01
Own Attachment Avoidance	-.00	-.11	.11	-.04	.969	.00	.05	-.07	.17	.81	.419	.05
Partners' Attachment Avoidance	.07	-.04	.17	1.25	.214	.08	-.23	-.35	-.11	-3.82	<.001	.22
Stress during Quarantine	.35	.26	.43	8.00	<.001	.43	-.28	-.38	-.18	-5.53	<.001	.30
<i>Model 2: Interaction Effects</i>												
Pre-Quarantine Chaos/Cohesion	.54	.45	.64	11.41	<.001	.55	.53	.42	.65	9.11	<.001	.47
Own Attachment Anxiety	-.01	-.10	.08	-.12	.903	.01	-.03	-.14	.07	-.66	.512	.04
Partners' Attachment Anxiety	.05	-.03	.14	1.21	.229	.07	.01	-.09	.11	.15	.881	.01
Own Attachment Avoidance	.00	-.11	.11	.05	.964	.00	.03	-.09	.16	.54	.591	.03
Partners' Attachment Avoidance	.06	-.04	.17	1.17	.243	.07	-.24	-.36	-.12	-3.99	<.001	.23
Stress during Quarantine	.36	.27	.44	8.30	<.001	.45	-.29	-.39	-.19	-5.76	<.001	.31
Own Attachment Anxiety X Stress	.01	-.07	.09	.24	.807	.02	-.07	-.17	.02	-1.49	.139	.09
Partners' Attachment Anxiety X Stress	.14	.06	.23	3.20	.002	.19	-.17	-.28	-.06	-3.11	.002	.18
Own Attachment Avoidance X Stress	.01	-.08	.10	.14	.890	.01	.05	-.06	.16	.98	.330	.06
Partners' Attachment Avoidance X Stress	-.08	-.18	.01	-1.68	.093	.11	.04	-.08	.16	.69	.492	.04

Note. Significant effects of attachment insecurity and stress are presented in bold. Approximate effect sizes *r* were computed using Rosenthal and Rosnow's (2007) formula: $r = \sqrt{(t^2 / t^2 + df)}$. In these multilevel models, the Satterthwaite approximation is applied to provide specific degrees of freedom for each effect representing the weighted average of the dyad- and individual-level degrees of freedom, which were used to calculate the effect sizes. Degrees of freedom ranged from 265.23-301.60 in Model 1 analyses and 239.39-291.11 in Model 2 analyses. * $p < .05$. ** $p < .01$.

A: Partner Attachment Anxiety and Home Chaos

B: Partner Attachment Anxiety and Family Cohesion

Figure 3. The Interaction Effects of Partners' Attachment Anxiety and Stress on Home Chaos (Panel A) and Family Cohesion (Panel B) during the COVID-19 Quarantine.

Note. Analyses control for home chaos/family cohesion prior to the COVID-19 pandemic. High and low levels are plotted at 1 SD above and below the mean.

Table 6. The Effects of Own and Partners' Attachment Insecurity Assessed Prior to the Quarantine and Stress During the Quarantine on Relationship Quality

Predictors	Relationship Satisfaction						Relationship Commitment					
	<i>B</i>	CI <i>Low</i>	CI <i>High</i>	<i>t</i>	<i>p</i>	<i>r</i>	<i>B</i>	CI <i>Low</i>	CI <i>High</i>	<i>t</i>	<i>p</i>	<i>r</i>
<i>Model 1: Main Effects</i>												
Pre-Quarantine Satisfaction/Commitment	.73	.63	.82	14.66	<.001	.67	.59	.46	.71	9.24	<.001	.47
Own Attachment Anxiety	-.07	-.18	.03	-1.36	.174	.08	-.04	-.11	.03	-1.02	.309	.06
Partners' Attachment Anxiety	-.12	-.23	-.02	-2.28	.023	.14	-.09	-.16	-.02	-2.48	.014	.15
Own Attachment Avoidance	.10	-.03	.22	1.50	.136	.09	-.02	-.11	.06	-.54	.587	.03
Partners' Attachment Avoidance	-.08	-.21	.04	-1.31	.191	.08	.03	-.06	.11	.57	.566	.03
Stress during Quarantine	-.21	-.31	-.10	-3.98	<.001	.23	-.05	-.12	.02	-1.42	.156	.08
<i>Model 2: Interaction Effects</i>												
Pre-Quarantine Satisfaction/Commitment	.72	.63	.82	14.51	<.001	.67	.58	.46	.71	9.08	<.001	.47
Own Attachment Anxiety	-.07	-.18	.04	-1.31	.191	.08	-.03	-.11	.04	-.92	.361	.05
Partners' Attachment Anxiety	-.12	-.23	-.02	-2.25	.025	.13	-.09	-.16	-.02	-2.39	.018	.14
Own Attachment Avoidance	.10	-.03	.23	1.48	.141	.09	-.03	-.12	.06	-.70	.487	.04
Partners' Attachment Avoidance	-.09	-.21	.04	-1.39	.166	.08	.02	-.07	.11	.44	.663	.03
Stress during Quarantine	-.20	-.30	-.10	-3.87	<.001	.22	-.05	-.12	.02	-1.43	.154	.08
Own Attachment Anxiety X Stress	-.04	-.13	.06	-.76	.450	.05	-.02	-.09	.04	-.71	.478	.04
Partners' Attachment Anxiety X Stress	.04	-.07	.15	.65	.517	.04	.01	-.07	.08	.12	.906	.01
Own Attachment Avoidance X Stress	-.00	-.11	.11	-.06	.951	.01	.04	-.04	.11	.94	.348	.06
Partners' Attachment Avoidance X Stress	-.01	-.12	.11	-.10	.918	.01	.01	-.08	.09	.07	.945	.00

Note. Significant effects of attachment insecurity and stress are presented in bold. Approximate effect sizes *r* were computed using Rosenthal and Rosnow's (2007) formula: $r = \sqrt{(t^2 / t^2 + df)}$. In these multilevel models, the Satterthwaite approximation is applied to provide specific degrees of freedom for each effect representing the weighted average of the dyad- and individual-level degrees of freedom, which were used to calculate the effect sizes. Degrees of freedom ranged from 264.65-306.43 in Model 1 analyses and 233.99-302.86 in Model 2 analyses. * $p < .05$. ** $p < .01$.

Discussion

The COVID-19 pandemic represents an acute, challenging event that puts to the test whether models in relationship science help identify whose relationships are vulnerable to disruption in the wake of this unprecedented global event (Pietromonaco & Overall, 2020). The current longitudinal study leveraged an existing sample to examine whether pre-existing vulnerabilities (attachment insecurity) assessed prior to the pandemic and stress during a mandated quarantine predicted residual changes in relationship functioning. Partners' attachment anxiety emerged as a consistent vulnerability that, along with stress, increased the risk of poor relationship functioning, including greater relationship problems, a more chaotic and less cohesive family environment, and lower relationship quality. These results uniquely emphasize that the potential detrimental effects of the COVID-19 pandemic on relationships will depend on the partners with whom people are confined with during quarantines.

Partners' Attachment Insecurity as an Important Risk Factor in Stressful Contexts

Partners' attachment anxiety played a role in predicting five of the six relationship outcomes examined indicating that partners' attachment anxiety is likely an important pre-existing vulnerability when people are confined with their partner during crisis. Partners high in attachment anxiety experience intense negative emotions, seek reassurance in counterproductive ways, and are difficult to soothe during stressful contexts (e.g., Overall et al., 2014; Simpson et al., 1996). Moreover, because they remain distressed even when they receive care and support, partners high in attachment anxiety often behave in punishing ways that amplify conflict, undermine caregiving, and damage love and closeness (e.g., Campbell et al., 2005; Collins & Feeney, 2004; Simpson et al., 1992). Receiving negative reactivity and excessive reassurance seeking by highly anxious partners is burdensome and dissatisfying, especially during challenging contexts (e.g., Campbell et al., 2005; Overall et al., 2014). Accordingly, partners' greater attachment anxiety predicted greater problem severity, lower satisfaction and lower commitment during a mandatory COVID-19 quarantine.

Consistent with diathesis-stress attachment models (Simpson & Rholes, 2012, 2017), partners' attachment anxiety also predicted greater problem severity and a poorer family environment when people were experiencing high, but not low, levels of stress. Compared to the evaluative outcomes that involved only main effects of partners' attachment anxiety (satisfaction, commitment), the outcomes that involved interaction effects with stress (problem severity, home chaos, family cohesion) may more closely capture couples' ability to work together to manage the challenges of family confinement. Despite feeling less satisfied, some people are able to soothe anxious partners, ease difficult interactions, and compensate for any detrimental effects on relational dynamics (Lemay & Dudley, 2011; Overall & Simpson, 2015). However, such buffering may occur when stress is low, but will be more difficult when individuals are depleted by high stress (Buck & Neff, 2012). Moreover, not only will highly anxious partners' unrealistic needs and destructive behaviors go unabated when individuals are stressed, individuals' own need for support and help to manage the family environment will clash with anxious partners' self-focused needs, producing more problematic rather than cohesive interactions (e.g., Beck et al., 2013; Jayamaha et al., 2017).

The results also indicate that partners' attachment avoidance may hinder functioning during the pandemic and quarantines: greater partners' avoidance predicted lower problem solving efficacy and family cohesion. Although longitudinal effects emerged only for two of five indicators of relationship functioning, these effects were strong and are consistent with the detrimental effects of attachment avoidance shown in prior work. Highly avoidant partners withdraw when encountering problems, which reduces successful problem resolution (Overall et al., 2013; Simpson et al., 1996). Highly avoidant partners also provide poorer caregiving and restrict closeness (Pietromonaco & Barrett, 1997; Simpson et al., 2002), which likely contributed to feeling less connected as a family during the quarantine.

However, although partners' attachment avoidance was associated with greater problem severity and lower relationship quality prior to the pandemic (see Table 3), partners' avoidance did not predict residual changes in these outcomes. It might be that quarantines create a context in which the distancing strategies enacted by avoidant partners undermine cohesion, but nonetheless contain growing problems, at least in the short-term. Compared to attachment anxiety, partners high in attachment avoidance are unlikely to express intense negative emotions, rumination and support seeking, which may be particularly demanding for individuals during the challenges of quarantine. The need for families to 'get through' quarantine may also mean that avoidant distancing bypasses a focus on problems that cannot be solved or controlled given the situation at hand (see Ross et al., 2019). These possible benefits might have counteracted any increases in problem severity and dissatisfaction resulting in no residual increases from pre-quarantine. Yet, continued disengagement and lower cohesion may risk growing problem severity, home chaos and poor relationship quality as the stress of the pandemic and need for couples to support one another grows.

Contributions and Caveats

Some scholars have warned that most social psychological models are untested in the real world of acute, stressful events and may be unsuitable to understand or guide decisions regarding mitigating the impact of COVID-19 (IJzerman et al., 2020). Our investigation was founded on the theoretical integration of two key models in relationship science identifying attachment insecurity as an important vulnerability that should hinder couples' capacity to adapt to the relational strains of mandatory quarantines. The results demonstrate the combined utility of the Vulnerability-Stress-Adaptation (Karney & Bradbury, 1995) and diathesis-stress attachment (Simpson et al., 2012, 2017) models in predicting the risk of poor relationship functioning in the unprecedented, untested context of a global pandemic.

Applying these models to a unique quarantine context provides valuable theoretical insights. First, the vulnerabilities that matter most depend on key features of the context. VSA-inspired investigations have examined external stress relevant to quarantines (economic hardship, work stress, poorer social networks; Neff & Karney, 2017), but have not considered the role of attachment insecurity. By contrast, attachment research has examined lab-induced stress or specific relational stressors (e.g., transition to parenthood; Simpson & Rholes, 2012, 2017). The uncontrollable, acute and shared nature of quarantines make attachment insecurity a particularly relevant vulnerability in this context. With no choice and little warning, people

were thrust into a threatening attachment-relevant context involving couples forced to depend on each other to navigate the daily challenges of family isolation.

Second, the results emphasize the need to understand the relationship risks of stressful events from a dyadic perspective. Despite the interdependence of human life, most research focuses on individuals' characteristics as vulnerabilities to poorer relationship functioning. Indeed, a recent large-scale project concluded partner characteristics play a minor role in shaping relationship quality (Joel et al., 2020). One likely reason some prior studies have failed to identify partner effects is they have not examined couples within interdependent strain-test contexts in which partners' characteristics really matter (McNulty, 2016). The current results indicate that partners' vulnerabilities may pose greater risk to relationships when partners are a central feature of emergent stressful contexts, such as when people are confined with partners to face the challenges of family life during a global pandemic.

Third, the results emphasize that dyadic longitudinal designs are critical for understanding the effects of the pandemic (and other stressors). Amid the understandable proliferation of research investigating the impact of the pandemic on health and well-being, the strongest evidence emerges from longitudinal designs, like ours, that examine residual changes in functioning (e.g., Schmid et al., 2020; Sibley et al., 2020; Williamson, 2020; Zacher et al., 2020). However, prior investigations have primarily examined individuals, which fails to acknowledge the social reality of people's lives, and have not examined how both individuals and partners' vulnerabilities assessed pre-pandemic shape relationship functioning. In the current study, partners' attachment insecurity, and not individuals' attachment insecurity, had longitudinal effects. This pattern does not mean that individual characteristics do not matter. Individuals' anxiety and avoidance were cross-sectionally associated with poorer functioning at both assessments (see Table 3), suggesting these negative effects may simply persist into the context of the pandemic and quarantines. By contrast, the effects of partners may become more apparent during quarantines when partners' reactions are particularly salient and impactful.

Despite the strengths of the dyadic longitudinal design, the necessarily correlational nature of the data limits causal conclusions, leaves open the possibility of third variables, and does not offer a 'control' condition to compare changes in relationship functioning in the absence of the COVID-19 pandemic. Dyadic longitudinal designs also restrict sample sizes, which may limit power to detect small but meaningful effects, especially if individuals' vulnerabilities already have damaging effects prior to the pandemic. Moreover, the ability to detect risks to relationships should be greater in samples involving greater insecurities and adversity. Our sample was relatively well-functioning and secure, and people higher in attachment avoidance and problem severity were less likely to complete the quarantine assessment. The risk of poorer outcomes associated with attachment insecurity is likely greater for couples facing more substantial stress, economic strain and difficult living conditions (Neff & Karney, 2017). For example, individuals' and partners' attachment insecurity may have weaker effects in contexts when people are able to regulate distance (e.g., working, going for a walk, spending time in another room), but have more detrimental effects when people have little room or resources to escape the pressures of quarantine.

Similarly, although the mandatory lockdown in NZ placed all families in a confined quarantine that could disrupt relationship functioning, this swift and strong response to the pandemic was accompanied by increases in trust in the government, police and science (Sibley et al., 2020). Support of the lockdown also may have allowed families to capitalize on the opportunity to spend more time as a family and support one another (Pietromonaco & Overall, 2020; Stanley & Markman, 2020), counteracting some of the difficulties couples faced during the initial stages of the pandemic. Yet, even for the relatively well-functioning, secure couples in our sample, greater stress and partners' attachment insecurities predicted residual decreases in relationship functioning. The risks to relationships are likely to grow as couples encounter ongoing challenges, especially in contexts where prolonged uncertainty, stress, isolation and economic disadvantage place couples under increasing strain.

Conclusion

The current investigation illustrates the utility of key models in relationship science in identifying which couples are at most risk of relationship problems when experiencing the stressful, unprecedented context of a mandated quarantine. The results emphasize that the impact of the COVID-19 pandemic will be shaped by the characteristics of partners with whom people are confined with during the pandemic. Greater partner attachment anxiety predicted greater relationship problems, lower relationship quality, and a less stable and cohesive family environment when people were experiencing more stress. Greater partner attachment avoidance predicted lower problem solving efficacy and family cohesion. Such vulnerability to poor relationship functioning is critical given the downstream consequences of these outcomes, including poorer health and well-being of both adults and their children (Pietromonaco & Overall, 2020; Prime et al., 2020). The current findings illustrate that understanding and promoting how best to navigate the risks of the pandemic and quarantines requires attending to the dyadic context of people's lives.

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