



# Positive Relationships have Shades of Gray: Age is Associated with More Complex Perceptions of Relationship Quality During the COVID-19 Lockdown

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## Abstract

Drawing on socioemotional selectivity theory, we examined the effect of COVID-19 lockdowns on perceptions of romantic relationships quality among older, compared to younger, adults. During the first lockdown in Israel which involved strict restrictions on movement and association with others, 280 adults aged 25–81 reported positive and negative qualities of their romantic relationship. Of these, 105 participants completed the survey again once lockdown restrictions were lifted. Contrary to our hypotheses, no evidence for age differences in the effect of the lockdown on positive or negative perceptions of relationship quality was detected. In addition, the lockdown did not influence participants' positive and negative perceptions of their romantic partners. However, we did find that, whereas people of all ages represent positive and negative qualities of their romantic partners as separate constructs, the negative association between the two is weaker for older adults compared to younger adults during (but not after) the lockdown. This finding suggests that in stressful times, older adults are better able to avoid negative perceptions clouding positive perceptions and see positive aspects of relationships with romantic partners in the face of negative ones. Findings extend evidence for age associations with complex emotional experiences to emotional aspects of interpersonal relationships. Findings enrich the theoretical understanding of age-related advantages in emotional well-being and may inform potential interventions for improving emotional health and well-being during times of crisis.

**Keywords** Socioemotional selectivity theory · Time horizons · Romantic partners · Relationship quality · COVID-19 · Affect complexity

## Introduction

The COVID-19 pandemic has posed significant challenges to mental and emotional well-being worldwide. Evidence abounds that mental distress increased, and well-being decreased, especially during the early stages of the pandemic when much was unknown and strict preventive measures were taken by many governments (O'Connor et al., 2021; Twenge & Joiner, 2020; Zacher & Rudolph, 2021). Of these, perhaps none was more dramatic than national lockdowns

forcing billions to stay in their homes with only their household members for company (Van Bavel et al., 2020). During the pandemic, romantic relationships were of particular concern given the compounding factors of social isolation, financial stress, and anxiety (Pietromonaco & Overall, 2021).

There is convincing evidence that relationship satisfaction declined among some couples, particularly those who have been facing pre-existing and pandemic-related stressors (Luetke et al., 2020; Schmid et al., 2021). Yet, a considerable body of evidence suggests that, for many, relationship satisfaction may have changed only little with the onset of the pandemic, and among some couples it even slightly improved (Goodwin et al., 2020; Overall et al., 2021; Williamson, 2020). The picture emerging is thus one of considerable variability in the pandemic's effect on relationship satisfaction (Pietromonaco & Overall, 2022). This variability calls for further work to identify personal characteristics that contribute to relationship resilience under considerable

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strain. Such work can lead to theoretical advancements regarding mechanisms of resiliency in times of crisis, and to interventions aimed at promoting it. Guided by socioemotional selectivity theory (SST; Carstensen, 2006; Carstensen et al., 1999), in the current paper, we examine the role of age-related shifts in motivation and emotional experience in shaping the perceived quality of romantic relationships during, and after, the first nation-wide lockdown in Israel.

### Age-Related Changes in the Quality of Romantic Relationships

According to SST, when time horizons are limited people prioritize goals related to feeling states in the present moment. As a result, when the fragility of life is primed and endings are salient (as they typically are in older adulthood), people prioritize goals related to emotional meaning and closeness with others. The theory explains well-documented age advantages in emotional well-being (Burr et al., 2020; Carstensen et al., 2011) and places selective focus on emotionally close relationships as a key to these advantages. A large body of evidence finds that older adults have proportionally more close relationships in social networks compared to younger adults (e.g., Fung et al., 2008; Lang & Carstensen, 2002), and that selective pruning of social networks to include primarily close relationships is related to better emotional well-being with age (English & Carstensen, 2014).

Romantic relationships, as one of the most important relationships throughout the life course exhibit patterns consistent with SST postulates. Past studies found that compared to younger couples, older couples' interactions were marked by less potential for conflict, more positive affect and less negative affect (Carstensen et al., 1996; Levenson et al., 1994). Later work found that older adults place more emphasis on "togetherness" in their relationships than do younger adults, contributing to more positive and less negative emotional behavior during interactions (Seider et al., 2009). Correspondingly, evidence suggests that older adults' satisfaction with their romantic partners is more robust. Evidence further suggests that older adults' satisfaction with their romantic partners is more robust compared to younger adults' (Braun et al., 2018; Chopik et al., 2013), who are more likely to experience fluctuations in their relationship satisfaction due to external stressors (e.g., Williamson et al., 2021). Taken together, evidence suggests that age is an important moderator of romantic interactions. Consistent with SST postulates, older adults seem to prioritize the maintenance of positive relationships with their romantic partners.

Prior research found that age differences in prioritizing emotionally close relationships are eliminated in situations that highlight the passing of time and the fragility of life. In a

series of studies, Fung and Carstensen found that in the face of national catastrophes age-related preference for spending time with emotionally close partners is eliminated, with people of all ages preferring to spend time with emotionally close partners (Fung & Carstensen, 2006; Fung et al., 1999). Importantly, Fung and Carstensen (2006) observed that in the height of the SARS epidemic in Hong Kong, a historical event akin to the COVID-19 pandemic, older and younger adults alike prioritized emotionally close relationships.

The extraordinary and horrific circumstances posed by the COVID-19 pandemic allowed us to test the mechanism proposed by SST for better relationship quality with age. Based on SST, our first aim in the current study was to explore whether age differences in relationship quality were attenuated during the height of the pandemic, when national lockdowns highlighted the fragility of life and engendered a limited future time perspective. We hypothesized that under these circumstances, people of all ages prioritize emotionally close relationship and extend the kindness towards their partners typical of older adults.

That is, we expected to find a main effect of time indicating that, on average, perceived relationship quality is better during lockdowns compared to post lockdowns, because people of all ages have limited time horizons. SST postulates that age differences in socioemotional goals result from naturally occurring differences in future time horizons (Carstensen, 2006; Carstensen et al., 1999). Therefore, we hypothesized that age differences do not appear during lockdowns, but emerge when the lockdowns are lifted, signaling that the life-threatening crisis has subsided. According to SST, this should lead people's time horizons to return to a more natural state, in which age differences exist. Hence, our first set of hypotheses was that

**H1** During lockdowns, perceived relationship quality is more positive and less negative compared to post lockdowns, on average.

**H2** Lockdown status moderates the relationship between age and perceived relationship quality such that during lockdowns age is not associated with relationship quality, and post lockdowns age is associated with perceiving more positive and less negative relationship quality.

### Age-Related Changes in Emotional Experience May Lead to Perceiving Relationship Quality Through a More Complex Lens

A secondary aim of the current study was to examine age-related psychological developments that may contribute to relationship quality. Specifically, we were interested whether an emotionally complex outlook on life—defined as an evaluation of positive and negative aspects of emotional life

independently (Bodner et al., 2012; Grünh et al., 2013; Hay & Diehl, 2011)—might extend to relationship quality among couples of different ages. Although several definitions of emotional complexity exist in the literature with mixed evidence regarding age differences (Grünh et al., 2013; Ready et al., 2008; Scott et al., 2014), in the current study we refer to emotional complexity as a relatively weak correlation between reports of positive affect and negative affect. We focus on this definition because weak correlation of positive and negative affect is associated with better emotional well-being and may act as an emotion regulation mechanism, especially in older ages (Bodner et al., 2012, 2015). We thus believe that during the days of the pandemic, and particularly during the lockdown, the ability to perceive positive qualities in romantic partners while recognizing negative ones may help couples regulate stress in their partnership resulting in better relationship quality.

According to SST, older adults experience greater emotional complexity than younger adults do because limited time horizons lead to mixed emotional experience. SST postulates that under limited time horizons emotional experience involves feeling positive emotions alongside negative emotions stemming from perceived endings (Ersner-Hersfield et al., 2008). The theory suggest that this may be one reason for the well-documented age advantages in emotional well-being which allows older adults to focus on positive aspects of their lives even when faced with negative circumstances (Carstensen et al., 2011; Charles & Carstensen, 2010). The relationship between limited time horizons and emotional complexity in the service of emotion regulation has been well established in laboratory and naturalistic settings alike (Ersner-Hersfield et al., 2008; Zhang et al., 2010).

Drawing on previous findings, we hypothesized that during lockdowns, when the threat of the pandemic is prominent and time horizons are expected to be limited, people of all ages tend to experience positive and negative qualities of romantic relationships independently. That is, we expected that negative perceptions of romantic partners would be a worse estimator of positive perceptions of romantic partners during (compared to post) lockdowns. Consistent with SST postulates regarding the role of time horizons, we expected that the ability to perceive positive and negative relationship qualities independently would only be observed among older adults once restrictions are lifted and the vividness of the pandemic subsides. We hypothesized a three-way interaction indicating that during lockdown, when time horizons are expected to be limited for people of all ages, there are no age differences in the association between perceptions of negative and positive relationship quality, but that once lockdown restrictions are lifted, negative perceptions of romantic partners are a better estimator of (i.e., more strongly correlated

with) positive perceptions of romantic partners for younger adults than older adults. Specifically, we hypothesized that

**H3** Perceptions of positive and negative qualities of romantic relationships are more weakly correlated during, compared to post, lockdown.

**H4** Age moderates the negative association between the perceptions of positive and negative relationship qualities such that the correlation is weaker among older (compared to younger) participants after, but not during, lockdowns.

## Method

### Procedure

Data for the current study were collected in Israel at two time points using a web-based survey. The first wave of data collection took place between April 1 and April 14, 2020, during a national lockdown with severe restrictions. The second wave of data collection took place between June 7 and June 14, 2020, after many of the restrictions had been removed. After receiving Institutional Review Board approval, we recruited participants by posting invitations on online forums and social media outlets to take part in a study that explores associations between patterns of couple dynamics and coping with COVID-19. Participants were eligible if they were at least 18 years of age, had a romantic partner at the time, and were cohabiting with their partner during the lockdown. Eligible and willing participants provided their consent before completing the study.

### Participants

We recruited 280 participants aged 25–81 ( $M = 44.72$ ,  $SD = 13.61$ ) who were in a committed relationship (80.7% married, 19.3% unmarried but living with a partner) during the first national lockdown in Israel (Time 1), in which people were not allowed to travel more than 500 m (less than half a mile) from their home for any reason other than seeking medical assistance or purchasing food. Nearly all participants identified as Jewish (96.4%),<sup>1</sup> and most identified as female (80.6%). The majority reported having children at home (65.4%). On average, participants were educated and in good health (see Table 1 for sample characteristics). At Time 2, when the national lockdown was lifted, 105 participants reentered the survey to complete the questionnaire once again (62.5% attrition). Participants who were

<sup>1</sup> In Israel, religious affiliation is more informative than race regarding ethnicity and cultural background.

**Table 1** Sample characteristics and correlations with age (Wave 1)

	Mean (SD) or N (%)	Correlation with age [95% C.I.]
Age	44.72 (13.61)	–
Gender (Female)	224 (80.6%)	–0.08 [–0.19, 0.04]
Religious affiliation (Jewish)	270 (96.4%)	0.07 [–0.05, 0.18]
Marital status (Married)	226 (80.7%)	<b>0.19**</b> [0.08, 0.30]
Children at home (Yes)	183 (65.4%)	<b>–0.25***</b> [–0.36, –0.14]
Employment affected by the pandemic (Yes)	101 (36.6%)	–0.10 <sup>+</sup> [–0.22, 0.01]
BSI	27.48 (7.91)	<b>–0.24***</b> [–0.35, –0.12]
Health status	4.18 (0.8)	–0.09 [–0.21, 0.03]
Years of education	17.07 (3.04)	0.05 [–0.07, 0.17]

Bold values in the tables depict statistically significant results ( $\alpha = 0.05$ )

For binary variables, the value in parentheses is coded as 1

\*\*\* $p < 0.001$ , \*\* $p < 0.01$ , \* $p < 0.05$ , + $p < 0.1$

lost to attrition had fewer years of education ( $M = 16.59$ ) compared to those who remained in the study ( $M = 17.89$ ;  $t(274) = -3.51$ ,  $p < 0.001$ ). Other demographic differences between the two groups were not significant (see table S1 in the supplement).

## Materials

*Relationship quality* was assessed by measuring three positive qualities, focused primarily on perceived positive attributes of one's romantic partner, on a scale from 1 ("not at all") to 5 ("extremely"): (a) satisfaction (seven items; e.g., "How content are you with your relationship?"; Fletcher et al., 2000;  $\alpha = 0.93$ ), (b) intimacy (six items; e.g., "My partner listens to me when I need someone to talk to"; Schaefer & Olson, 1981;  $\alpha = 0.84$ ), and (c) partner facilitation (five items; e.g., "My spouse helps me to do the things I need to do each day"; Solomon & Brisini, 2017;  $\alpha = 0.85$ ); and two perceived negative qualities of one's romantic partner measured on a 5-point Likert scale: (a) partner hostility (measured using five items taken from Cook & Medley, 1954;  $\alpha = 0.77$ ), and (b) partner interference (five items; e.g., "My spouse disrupts my daily routine"; Solomon & Brisini, 2017;  $\alpha = 0.82$ ). Following evidence that positive and negative qualities may be distinct from one another (Mattson et al., 2007; Rogge et al., 2017), we conducted factor analysis on these items to determine the structure of the latent relationship quality variable.

Age was measured using the item: "How old are you?" (in years). Other demographic variables included *gender* (recoded to indicate Female / Not female), *religious affiliation* (recoded to indicate Jewish/Not Jewish), *duration of the current relationship*, and *the presence of children at home*. In addition, participants were asked whether their employment was affected by the pandemic and asked to report their current health. *Change in employment* was recoded as Yes/No because most participants (62.5%) reported no change in their employment status (when change was reported participants indicated reduced levels of employment). *Health status* was measured using a single item: "How would you describe your current health status?" with responses on a 5-point Likert scale ranging from "Not good at all" to "Very good."

*Mental health* may affect perceptions of relationship quality and was therefore assessed using a Hebrew version of the Brief Symptom Inventory scale (BSI-18; Derogatis, 2000). This 18-item scale measures symptoms of the most common dimensions of psychological distress, namely, somatization (e.g., "feeling weak in parts of your body") ( $\alpha = 0.74$ ), depression (e.g., "feeling no interest in things") ( $\alpha = 0.80$ ), and anxiety (e.g., "suddenly scared for no reason") ( $\alpha = 0.81$ ). Overall, participants' mental health was comparable to the Israeli norms reported by Gilbar and Ben-Zur (2002).

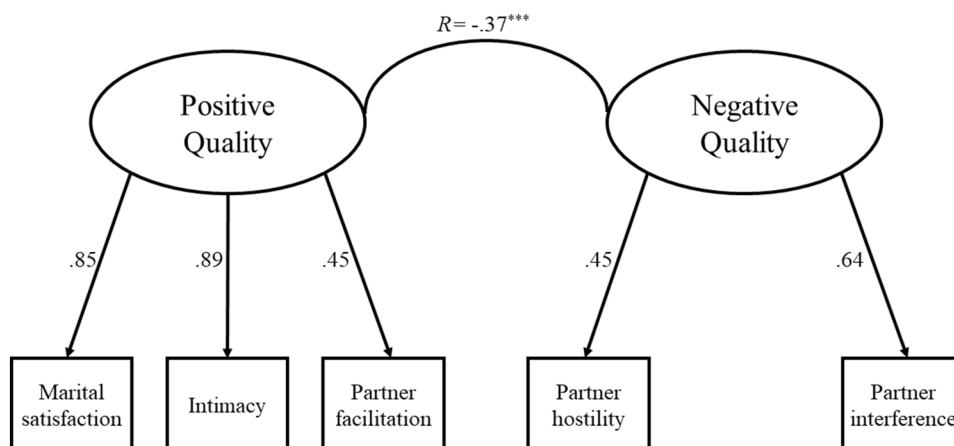
## Results

To test our hypotheses, we first conducted factor analysis to explore the structure of relationship quality as a latent construct, and whether it is best captured by a single dimension or two (i.e., positive and negative). We then regressed age and lockdown status (during vs. post lockdown) on relationship quality using multi-level linear regressions with random intercepts for individuals. Because our hypotheses relate to the association between age and perceptions of romantic partners, we wanted to rule out alternative explanations. We therefore included variables that were significantly associated with age as a second step (after identifying them in a preliminary analysis) whenever age-related associations were observed, as recommended by Becker et al. (2016) (see also Bernerth & Aguinis, 2016). To control for potential confounds, as a second step we included variables that were significantly associated with age (after identifying them in a preliminary analysis). Analyses were conducted in R version 4.0.3 (R core team, 2020; see supplement for packages).

## Preliminary Analysis

As a preliminary step, we examined the correlations between age and demographic characteristics (see Table 1). At Time 1, age was significantly associated with lower likelihood

**Fig. 1** Results of confirmatory factor analyses of relationship quality measures in Time 1.  $N=280$



of having kids at home ( $R(278) = -0.25$ ,  $p < 0.001$ , 95% C.I.  $[-0.36, -0.14]$ ), greater likelihood of being married ( $R(278) = 0.19$ ,  $p = 0.001$ , 95% C.I.  $[0.08, 0.30]$ ), and fewer mental health symptoms ( $R(278) = -0.24$ ,  $p < 0.001$ , 95% C.I.  $[-0.35, -0.12]$ ).<sup>2</sup> To establish the contribution of age over and above potential confounds, we included these variables as covariates in subsequent analyses.

Next, we conducted factor analyses using the data from Time 1 to determine if perceived relationship quality is best captured as a single latent construct or as a construct comprised of multiple dimensions. To avoid artifacts stemming from positively and negatively worded items, we reverse-coded scales reflecting negative views of one's partner (partner hostility and interference) such that high score on all scales reflected positive relationship quality, then centered all variables on their mean. We conducted an Exploratory Factor Analysis (EFA) using the 'fa.parallel' and 'fa' function in the 'psych' package in R (Revelle, 2020). The EFA revealed that the data are best captured by two factors ( $\chi^2(1) = 0.06$ ,  $p < 0.80$ , TLI = 1.02, RMSEA = 0.00 90% C.I.  $[0.00, 0.11]$ ). To obtain more accurate factor loadings and fit indices, we followed this procedure with a Confirmatory Factor Analysis (CFA) using the 'cfa' function in the 'lavaan' package in R (Rosseel, 2012). The CFA suggested that a two-factor solution is a good fit for the data ( $\chi^2(4) = 0.80$ ,  $p = 0.94$ , CFI = 1.00, RMSEA = 0.00 95% C.I.  $[0.00, 0.02]$ ).<sup>3</sup>

Items reflecting positive views of the relationship (relationship satisfaction, intimacy, and partner facilitation) loaded on one factor labeled "Positive quality," and items

reflecting negative views of the relationship (partner hostility and interference) loaded on a second factor labeled "Negative quality" (see Fig. 1 for factor loadings). The three items in the "Positive quality" measure showed good internal validity (Cronbach's alpha = 0.73). The two items in the "Negative quality" measure were positively correlated ( $R(263) = 0.27$ ,  $p < 0.001$ ). As can be expected, the two factors were negatively associated ( $R(278) = -0.37$ ,  $p < 0.001$ , 95% C.I.  $[-0.47, -0.27]$ ). Findings were effectively identical when we used the data from Time 2 (see figure S1 in the supplement). These findings are consistent with the literature (Mattson et al., 2007; Rogge et al., 2017) and correspond to our aim of examining age differences in the association of positive and negative perceptions of romantic relationships. We therefore treated positive and negative relationships quality as separate, but related, measures of relationship quality.

Average ratings of positive relationship quality during and post lockdown were  $M = 3.92$  ( $SD = 0.65$ ), and  $M = 3.94$  ( $SD = 0.77$ ), respectively. Average negative relationship quality ratings were  $M = 2.0$  ( $SD = 0.61$ ) during the lockdown and  $M = 2.07$  ( $SD = 0.63$ ) post lockdown. Importantly, positive and negative relationship quality scores were similar between participants who completed the survey in both time points ( $M = 4.00$ ,  $SD = 0.65$ ;  $M = 1.99$ ,  $SD = 0.62$ , respectively) and those lost to attrition ( $M = 3.87$ ,  $SD = 0.65$ ;  $M = 2.04$ ,  $SD = 0.61$ , respectively). Independent samples  $t$ -tests confirmed that the differences in ratings were not statistically significant (Positive quality:  $t(278) = 1.64$ ,  $p = 0.1$ ,  $Cohen's D = 0.2$ , 95% CI  $[-0.04, 0.44]$ ; Negative quality:  $t(278) = -0.68$ ,  $p = 0.5$ ,  $Cohen's D = -0.08$ , 95% CI  $[-0.33, 0.16]$ ).

## Primary Analyses

We examined the associations between age and relationship quality during and post lockdown using multi-level linear regressions with random intercepts for individuals and

<sup>2</sup> Age correlations with demographic variables in Time 2 (after lockdown) were comparable (see supplemental table S2). See supplemental Tables S4 and S5 for correlations among all variables.

<sup>3</sup> A confirmatory factor analysis suggested that a one-factor solution also provides acceptable fit measures by some standards  $\chi^2(5) = 8.67$ ,  $p = 0.12$ , CFI = 0.98, RMSEA = 0.05 95% C.I.  $[0.00, 0.11]$ . However, these are worse than the fit measures for a two-factor solution.

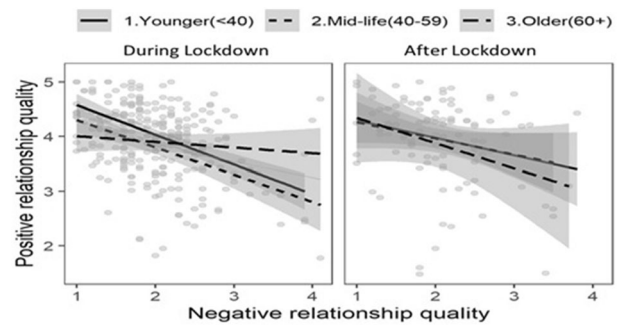
fixed effects for age, time (i.e., lockdown status), and their interaction in separate regressions for positive and negative relationship quality. Missing data points were removed from analyses. We did not have differential hypotheses for positive and negative perceptions of relationship quality and examined both outcomes independently. Therefore, we used a Bonferroni-corrected significance level of  $\alpha=0.025$  to examine statistical significance in the first set of hypotheses.

We hypothesized that during lockdowns relationship quality is more positive and less negative compared to post lockdowns. Contrary to the hypothesis, we did not observe significant effects of time indicating better relationship quality during the lockdown compared to after the lockdown (positive quality:  $\beta = -0.05$ ,  $p = 0.23$ , 97.5% CI [-0.14, 0.04]; negative quality:  $\beta = 0.07$ ,  $p = 0.15$ , 97.5% CI [-0.04, 0.19]). Because the effects of interest were not statistically significant, we did not proceed to include covariates.

We further hypothesized an Age  $\times$  Time interaction suggesting that age is associated with relationship quality after, but not during, the lockdown (H2). Consistent with the hypothesis, in Time 1 we did not find evidence for age association with neither positive ( $\beta = -0.07$ ,  $p = 0.1$ , 97.5% CI [-0.16, 0.02]) nor negative relationship quality ( $\beta = 0.04$ ,  $p = 0.27$ , 97.5% CI [-0.04, 0.12]). However, contrary to H2, we did not find evidence for an Age  $\times$  Time interaction (Positive quality:  $\beta = -0.01$ ,  $p = 0.88$ , 97.5% CI [-0.1, 0.08]; Negative quality:  $\beta = -0.06$ ,  $p = 0.21$ , 97.5% CI [-0.18, 0.05]). After the lockdown, age was not associated with positive ( $\beta = -0.07$ ,  $p = 0.15$ , 97.5% CI [-0.19, 0.04]) nor negative relationship quality ( $\beta = -0.02$ ,  $p = 0.65$ , 97.5% CI [-0.15, 0.1]), suggesting that age is unrelated to ratings of positive and negative relationship quality regardless of lockdown status. Because the effect of interest was not significant, we did not proceed to include covariates.

In the second set of hypotheses, we expected to find a weaker correlation between positive and negative perceptions of relationship quality during, compared to post lockdown (H3). We further expected to find no age differences in this correlation (i.e., the degree to which negative perceptions of relationship quality may affect positive perceptions) during lockdown, but that a negative association between the two would appear among younger, but not older, adults post lockdown (H4). To test H3 and H4, we estimated positive relationship quality using multi-level linear regressions with fixed effects for age, time, negative relationship quality and their interactions, and random intercepts for individual participants.

As expected, negative relationship quality was associated with less positive relationship quality ( $\beta = -0.19$ ,  $p < 0.001$ , 95% CI [-0.26, -0.12]) during the lockdown. Contrary to H3, however, we did not find a significant interaction between lockdown status and negative perceptions of relationship quality  $\beta = 0.03$ ,  $p = 0.53$ , 95% CI [-0.06, 0.11].



**Fig. 2** Regression lines depicting the association between positive and negative relationship quality among older, mid-life, and younger, adults

This null finding suggests that (on average) negative and positive perceptions of relationship quality were similarly negatively correlated during the lockdown and once it was lifted.

Further, contrary to H4, a positive Age  $\times$  Negative quality interaction indicated that, during lockdown, older adults tended to view positive and negative relationship qualities more independently than younger adults ( $\beta = 0.07$ ,  $p = 0.007$ , 95% CI [0.02, 0.13]). Of note, as can be seen in Fig. 2, during the lockdown participants of all ages with low ratings of negative relationship quality had high ratings of positive relationship quality, but only older participants had high ratings of positive relationship quality when ratings of negative relationship quality were also high.

Further, a significant Age  $\times$  Negative quality  $\times$  Time interaction showed that after the lockdown, participants of all ages saw negative relationship quality as similarly detrimental to positive relationship quality ( $\beta = -0.10$ ,  $p = 0.02$ , 95% CI [-0.18, -0.02]; see Fig. 2). Indeed, after lockdown, the Age  $\times$  Negative quality interaction was not significant ( $\beta = -0.03$ ,  $p = 0.53$ , 95% CI [-0.11, 0.06]). We observed the same pattern when we included covariates, but the 3-way interaction only approached significance ( $\beta = -0.08$ ,  $p = 0.06$ , 95% CI [-0.16, 0.004]; see Table 2). Notably, when controlling for the fact that older adults were less likely to have children at home and fewer mental health symptoms in step 2, we found that age was associated with less positive relationship quality (see Table 2). Results were effectively identical when we included gender and other demographics as control variables (see table S3 in the supplement). These findings suggest that better mental health and fewer stressors at home are related to older adults' perception of positive relationship qualities while recognizing negative ones.

**Table 2** Multi-level linear regressions estimating perceived positive relationship quality

	Model 1			Model 2		
	Estimate	<i>t</i> ( <i>df</i> )	95% CI	Estimate	<i>t</i> ( <i>df</i> )	95% CI
(Intercept)	<b>3.91***</b>	102.95 (301.67)	[3.83, 3.98]	<b>4.08***</b>	46.35 (271.92)	[3.91, 4.26]
Age	-0.06	-1.64 (302.55)	[-0.14, 0.01]	<b>-0.12**</b>	-3.03 (292.60)	[-0.20, -0.04]
Time 2 (post lockdown)	-0.02	-0.47 (117.54)	[-0.10, 0.06]	-0.05	-1.21 (121.28)	[-0.13, 0.03]
Negative quality	<b>-0.19***</b>	-5.55 (352.39)	[-0.26, -0.12]	<b>-0.18***</b>	-5.45 (350.45)	[-0.25, -0.12]
Age × time 2 (post lockdown)	-0.02	-0.38 (116.94)	[-0.10, 0.07]	-0.004	-0.09 (117.29)	[-0.09, 0.08]
Age × negative quality	<b>0.07**</b>	2.70 (302.08)	[0.02, 0.13]	<b>0.07**</b>	2.60 (304.73)	[0.02, 0.12]
Time 2 (post lockdown) × negative quality	0.03	0.64 (132.31)	[-0.06, 0.11]	0.02	0.47 (128.54)	[-0.07, 0.11]
Age × time 2 (post lockdown) × negative quality	<b>-0.10*</b>	-2.36 (127.20)	[-0.18, -0.02]	-0.08 <sup>+</sup>	-1.90 (125.57)	[-0.16, 0.004]
Kids at home (Yes)				<b>-0.27**</b>	-3.18 (266.45)	[-0.44, -0.10]
Marital status (Married)				0.02	0.19 (266.26)	[-0.18, 0.22]
Mental health symptoms (BSI)				<b>-0.12***</b>	-4.01 (326.76)	[-0.18, -0.06]
Pseudo <i>R</i> <sup>2</sup> (Within-participants)	0.18			0.26		
Pseudo <i>R</i> <sup>2</sup> (Residual)	-0.09			-0.08		

Bold values in the tables depict statistically significant results ( $\alpha = 0.05$ )

\*\*\* $p < 0.001$ , \*\* $p < 0.01$ , \* $p < 0.05$ , + $p < 0.1$

## Discussion

The COVID-19 pandemic challenged romantic relationships as national lockdown forced billions around the world to physically interact only with household members. Initial worries over the possible detrimental effects of the pandemic on romantic partnerships gave way to a nuanced reality in which some couples withered while others persevered (Pietromonaco & Overall, 2022). Understanding factors that contribute to this variability is important for practical interventions and theoretical developments, as it may shed light on mechanisms leading to resiliency in romantic relationships. In the present study, we examined age as one factor that may explain the variability in relationship quality during the pandemic. To the best of our knowledge, this is the first study to examine age as a factor that contributes to change in relationship quality during the COVID-19 pandemic. With population aging, and due to the greater vulnerability of the older adults to the virus, focusing on age as a risk factor for romantic upheaval is of merit.

Based on socioemotional selectivity theory, we reasoned that age advantages in relationship quality are masked during lockdowns, which highlight the fragility of life and eliminate

age-related differences in goals and emotional experience. We hypothesized that age associations with perceptions of more positive qualities and less negative qualities in romantic partners reappear once lockdowns are lifted. Following the same logic, we hypothesized that emotionally complex perceptions of relationship quality (i.e., the ability to evaluate positive and negative qualities of romantic partners independently) are associated with older age after lockdown but not during lockdown where all individuals may feel uncertainty and take on a limited future time perspective. We did not find support for these hypotheses. We found that relationship quality was unrelated to age during and after the first national lockdown in Israel. We further found that age was associated with emotionally complex perceptions of relationship quality *during*, but not after, the lockdown.

The current findings are consistent with prior work showing that positive and negative evaluations of relationship quality are independent, albeit related, constructs (Mattson et al., 2007; Rogge et al., 2017). The findings extend the existing work by suggesting that personal and situational factors affect the relationship between positive and negative relationship qualities. Specifically, we found that during the most relationship-straining times of the pandemic, when

people were confined to their homes with their romantic partners, older adults were better able than younger adults to see positive qualities in their partnerships even when experiencing negative qualities as well. To the best of our knowledge, this is the first study to find differences in the association between positive and negative qualities among younger and older adults in romantic relationships. We suspect that this is because prior studies did not examine evaluations of relationship qualities under extreme circumstances.

Our findings may help explain reports that, early in the pandemic, older adults had better emotional well-being than younger adults. Although older adults reported worse emotional well-being during the pandemic compared to before, as a group they seem to have been affected less than younger adults by the crisis (Twenge & Joiner, 2020). A robust body of evidence found that older adults reported fewer negative emotions and mental health symptoms and more positive emotions compared to younger adults, but reasons for this age-advantage remained elusive (Bruine de Bruin, 2021; Carstensen et al., 2020; O'Connor et al., 2021; Sun & Sauter, 2021; Vahia et al., 2020). We similarly observed that age is associated with fewer mental health symptoms during the height of the pandemic. Findings from the current study hint that the ability to see the positive in romantic partners despite their negative qualities, may be one contributing factor to better emotional well-being with age during the pandemic.

It is possible that older adults are more likely than younger adults to perceive their partners in a complex manner during lockdowns because they are more used to spending time together under normal circumstances (they are less likely to be separated due to work, childcare, etc.). Yet, the finding that there are no age differences in the association between positive and negative perceptions of relationship quality after the lockdown hints to a stressor-specific mechanism which may help older adults endure challenging times. However, we were not able to examine the relationships among emotional complexity in experienced emotions, emotionally complex perceptions of romantic partners, and emotional well-being because we did not measure positive and negative emotions over time (Grühn et al., 2013). Our findings suggest that future research can benefit from examining this possible age-related pathway to better emotional and relational well-being more closely. Such work would be enriched by capturing the developmental trajectories of the association between positive and negative perceptions of romantic relationships and its effect on emotional well-being. In the current study, we considered only linear age trends because SST does not postulate non-linear trend.<sup>4</sup>

<sup>4</sup> An exploration of non-linear terms for age did not reveal any significant effects not interactions except for a u-shaped relationship between age and positive perceptions of relationship quality, which was not significant when we accounted for the presence of kids in the home.

Yet non-linear trends may be observed in studies relying on different theoretical frameworks that can predict when and why such trends may be observed.

The finding that older adult view their romantic partners through emotionally complex lenses in times of heightened stress adds to the literature tying emotional complexity to emotion regulation among older adults (Bodner et al., 2012, 2015; Charles & Carstensen, 2010). This finding suggests that when faced with inescapable stress, older adults may be more likely than younger adults to avoid an overwhelmingly negative view of daily life by recognizing that positive aspects, such as positive qualities of their partners, exist simultaneously.

Such a stressor-specific mechanism allowing older adults to maintain positive views in the face of negative ones may seem inconsistent with theoretical arguments postulating that inescapable stress hampers older adults' ability to regulate their emotions such as the strength and vulnerability integration model (SAVI; Charles, 2010). The SAVI model postulates that inescapable stress is detrimental to older adults' emotion regulations because it strains essential physiological resources that decline with age. The evidence supporting SAVI postulates relies primarily on situations in which the stressors result from interpersonal conflicts (Birditt, 2014; Charles et al., 2009). Yet, the finding that during lockdowns, times of heightened stress, older adults were able to see positive qualities in their relationships while acknowledging negative ones may suggest that when stressors do not involve interpersonal conflicts older adults may rely on emotionally close relationships to maintain emotional well-being (e.g., English & Carstensen, 2014). Such interpretation of the findings would be consistent with SAVI and SST alike.

Further, we cannot rule out the possibility that the onset of the pandemic may have proved to be a significant enough stressor to eliminate age differences in pre-existing positive and negative perceptions of relationship quality. This would not only be consistent with SAVI postulates but may explain the finding that positive and negative perceptions of relationship quality were similar among older and younger adults after lockdown restrictions were removed. That said, there is overwhelming evidence that the onset of the pandemic did not meaningfully alter age advantages in emotional well-being (Carstensen et al., 2020; Twenge & Joiner, 2020), with only limited evidence for a very small reduction in some aspects of these age advantages due to the pandemic (Sun & Sauter, 2021). It is possible, however, that the pandemic did not engender the type of stressors corresponding to SAVI postulates. Another possibility is that age differences in emotion regulation in situations involving other people may depend on the relationship in question. Older adults may be better able than younger adults



to embrace emotional complexities with romantic partners, but not others, when faced with inescapable stress. That said, the finding that older age is associated with complex perceptions of romantic partners during heightened stress but not once the stressor is removed may challenge SAVI postulates. Undoubtedly, more research is needed to understand the contexts in which stress is detrimental to older adults' emotional well-being, and when age-related psychological strengths may promote age advantages in dealing with stressors.

While findings from the current study may be inconsistent with SAVI, they are also not consistent with SST postulates. Yet, the findings may still be understood within this theoretical framework. For one, we did observe an age advantage in emotional well-being during the pandemic. This is consistent with SST postulates (Carstensen et al., 2020), which presume that better well-being with age is caused by focus on emotionally meaningful and positive aspects of daily life (Carstensen, 2006; Carstensen et al., 1999). The intentional focus on positive aspects of life, while recognizing negative ones (cardinal to emotional complexity as an emotion regulation mechanism), relates to the positivity effect, an age-related tendency to pay more attention to positive over negative stimuli (Mather & Carstensen, 2005; see review by Reed & Carstensen, 2012). Recently, Barber and colleagues found that, consistent with SST postulates, the positivity effect is sensitive to time horizons and is observed among younger adults when they are primed to perceive limited time horizons (Barber et al., 2016). Our findings similarly suggest that in situations likely to engender limited time horizons—such as the current pandemic—older adults see the positive aspects despite the presence of negative aspects. Although we did not find that this is also true for younger adults, the lack of a pre-pandemic baseline is a limitation that may account for this null finding, as we explain below.

### Limitations, Strengths, and Future Directions

The current study has obvious strengths in measuring relationship quality through multiple scales and following participants over time, but a few limitations need to be acknowledged. First, the study is limited in its lack of a pre-pandemic baseline, rendering the evaluation of the pandemic status itself impossible (Carstensen et al., 2020). In their study evaluating the effects of the SARS epidemic in Hong Kong on social preferences, Fung and Carstensen (2006) found that older and younger adults had different preferences in terms of time spent with close ones before and after, but not during, the SARS outbreak. In the current study, the COVID-19 pandemic was an ongoing crisis. Although lockdown periods are a time of heightened risk and stress, fragility of life may be highlighted throughout the pandemic

leading people of all ages to focus on emotionally meaningful aspects of romantic relationships. This may explain the lack of age differences in relationship quality ratings during and after the lockdown.

Lack of pre-pandemic baseline prevented us from assessing whether the pandemic's onset affected the association between positive and negative perceptions of relationship quality, and whether any such effect was similar for people of different ages. Evidence suggests that the presence of stressors may lead to a stronger negative correlation (i.e., less independence) between positive and negative emotions (Scott et al., 2014). We cannot rule out the possibility that under normal circumstances people of all ages can perceive positive and negative qualities of their romantic relationships independently, as was found in prior research (Mattson et al., 2007; Rogge et al., 2017). Of note, Scott et al. (2014) found that stressors have a weaker effect on the relationship between positive and negative emotions among older (compared to younger) adults. The current finding that during the lockdown perceptions of positive and negative relationship quality were less correlated in older compared to younger adults is consistent with Scott and colleagues' observation. Findings from the current study highlight a need for more research on age differences in positive and negative relationship quality in the absence of stressors compared to the presence of stressors in varying levels.

An additional limitation of the current study is its reliance on snapshots reports from only one romantic partner. A plethora of studies found that age trajectories in romantic relationships are strongly influenced by dynamics within dyads (see review by Michalowski et al., 2018), and that these dynamics differ significantly among older couples (Brinberg et al., 2018). In addition, past studies found age differences in couples' behavior and emotional experience within situations (Carstensen et al., 1996; Levenson et al., 1994; Seider et al., 2009), which the current study did not examine. The current finding that relationship quality among older and younger couples may be similar is consistent with the past findings indicating no associations between age and relationship satisfaction (Braun et al., 2018). Yet, such global assessments may not be optimal for examining this association. More attention should be given to effects of endings-priming situations such as the COVID-19 lockdowns on couple dynamics and interactions.

Finally, as in any study that relies on a sample of volunteers, the generalizability of the current findings is limited. First, we note the high percentage of females in the sample. Gender may be associated with perceived relationship quality (Kamp Dush et al., 2008; Stevens et al., 2005; although see Curran et al., 2015; Santtila et al., 2007), so it is possible that different patterns would be observed in a more gender-balanced sample. Second, the current sample may differ

from the general population in any number of unmeasured characteristics that could be associated with perceptions of relationship quality (e.g., personality traits). Similarly, the relatively high attrition between the two time points in the current study challenges findings' generalizability. We note that we did not find appreciable differences between participants who provided data at both time points and those who provided data only once in any of the main variables. However, there might be important differences between the two groups in variables that we did not measure, that could potentially affect the findings. Therefore, there is still a need to examine the robustness of the current findings by collecting more representative samples and controlling for potential confounds.

Limitations notwithstanding, the current study is of both theoretical and practical importance. Theoretically, to the extent that lockdowns engender a sense of limited time horizons, findings suggest that age and limited time horizons may interact to affect evaluations of relationship quality, rather than limited time horizons leading to age differences, as SST postulates. This contribution to the literature adds to recent findings showing that although age is associated with limited time horizons, the two may have independent, opposite, effects on emotional experience (Carstensen et al., 2020; Grünh et al., 2016). Future work should experimentally unpack the effects of age and limited time horizons on different aspects of relationship quality and satisfaction experimentally.

The study's findings also point to emotionally complex outlook on life as one psychological strength that may protect older adults' emotional and mental well-being, especially in times of crisis. As researchers and policy makers deliberate how to address mental health challenges during crises (Van Bavel et al., 2020), they may wish to consider ways to promote an emotionally complex outlook, as well as other lessons that could be learned from older adults' emotional resiliency. Interventions aimed at promoting emotionally complex outlooks among younger and middle-aged adults might be especially needed given their higher risk of emotional ill-being, compared to older adults (Carstensen et al., 2020; Twenge & Joiner, 2020). Such interventions would benefit from better understanding of mechanisms affecting emotional complexity in experienced emotions, its relationships with emotionally complex perceptions in different contexts, including romantic relationships, and how these might shape behaviors and attitudes.

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**Author Contributions** YZS analyzed the data and wrote the first draft of the manuscript. RE, RE-B, and DS-K conceptualized the study, designed the survey, and collected the data. All authors commented on the previous versions of the manuscript.

## Declarations

**Conflict of interest** The authors declare that they have no competing interests involved in this study.

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