

Daily Stress, Closeness, and Coping in Romantic Relationships During COVID-19-Related Lockdown: An Experience Sampling Study

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Data, materials and analysis code for this study are available by e-mailing the corresponding author. This study's design and its analyses were not preregistered.

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Abstract

Stress challenges romantic relationships and can negatively impact relationship functioning. We investigated the association between daily stress and feelings of closeness towards the partner within individuals during a particularly stressful time (i.e., first societal lockdown during the COVID-19 pandemic in Germany) and examined whether a preference for coping together with one's partner attenuates the negative effect of stress on closeness.

We conducted a two-wave experience sampling study for seven days at the beginning of the lockdown (April 2020, wave 1) and for seven days three weeks later (May 2020, wave 2). Participants rated the extent to which they cope with stress together with their partner once at the beginning of the study. During both waves, participants received a questionnaire on stress, partner contact, and closeness three times a day (N of participants = 272, N of observations = 6377).

Multilevel analyses confirmed the negative within-person association between stress and closeness: In situations when participants experienced greater stress than usual, they felt less close to their partner. In addition, we found a significant three-way interaction: When participants had partner contact, the negative effect of stress was buffered by their preference to cope dyadically rather than individually.

Taken together, the present study found that stress was negatively associated with closeness, notably both within and between individuals. Furthermore, this association was exacerbated among participants who typically do not prefer to cope with stress with their partner, suggesting that these individuals in particular may benefit from interventions targeting coping skills at the couple level.

Public Significance Statement: Overall, stress is detrimental for romantic relationships. However, it is not fully understood whether being momentarily more stressed is

associated with decreased romantic feelings in that same moment. Our study shows that when people are more stressed than usual, they are also more likely to feel less close towards their partner in that same instance, highlighting the importance of small moment-to-moment increases in stress for relationship functioning.

Keywords: communal coping, social support, daily stress, intimate relationships, COVID-19

Daily Stress, Closeness, and Coping in Romantic Relationships During COVID-19-Related Lockdown: An Experience Sampling Study

The COVID-19 pandemic affects people's lives and intimate relationships in multiple ways. Recent research indicates that the pandemic is associated with an overall increase in daily stress levels (Randall et al., 2021), which can negatively impact relationship functioning by increasing stress experienced within the relationship (Balzarini et al., 2020; Luetke et al., 2020). At the same time, it has been argued that the COVID-19 pandemic also holds the potential for relationship growth in couples (Pietromonaco & Overall, 2020). Coping together as a unit with external stressors and adversities has not only been shown to protect relationships from the detrimental effect of daily stress, but may also enhance relationship functioning and further strengthen the couple relationship (Bodenmann, 2005; Hilpert et al., 2018).

Surprisingly however, most of the studies demonstrating the effects of stress and coping on relational wellbeing focus on *interindividual* differences (Harper et al., 2000). The effect of stress and coping on relationship outcomes *within* individuals is investigated to a smaller extent. To contribute to the understanding of intraindividual variations of stress and wellbeing in the context of romantic relationships, the present study explored the association between subjective stress experiences and partner closeness on a daily basis during the first COVID-19-related lockdown in Germany. We applied an experience sampling design, which allowed us to disentangle *interindividual* from *intraindividual* variations of stress and relationship functioning. Hypothesizing a negative association between stress and closeness, we further investigated whether this association can be attenuated by coping preference: We examined the buffering effect of the preference to generally cope as a couple rather than individually (Bodenmann, 2005; Lyons et al., 1998).

Stress in Times of the COVID-19 Pandemic

Recent research has shown that people across all age groups and around the globe are confronted with various additional stressors due to the COVID-19 pandemic (Klaiber et al., 2020; Rodríguez-Rey et al., 2020; Shanahan et al., 2020). COVID-19-related stressors may include financial strain, perceived career threat, balancing work and homeschooling, cancellation of important activities, and changes in daily routines (Carroll et al., 2020; Klaiber et al., 2020; Rodríguez-Rey et al., 2020). Specifically during lockdown, stress levels can be assumed to be elevated as compared to pre-lockdown conditions (Randall et al., 2021).

The perception of stress represents a subjective experience: The intensity of subjective stress evoked by the same stressor differs between persons and may also vary within persons depending on time and context (Lazarus, 1999). Therefore – in contrast to studies examining concrete stressors, such as specific daily hassles or pandemic-related stressors (Balzarini et al., 2020; Harper et al., 2000) – we aimed to capture momentary *feelings* of stress in daily life, thus conceptualizing daily stress as an emotional state (Lazarus, 1993). Consequently, subjective stress experiences as assessed in our study are not exclusively linked to specific COVID-19 stressors. However, taking into account the time of data collection (i.e., lockdown), feelings of stress are likely to have been influenced by pandemic-related stressors (Randall et al., 2021).

Consistent with previous research on stress and relationship functioning, pandemic-related stress has been shown to negatively influence relationship quality on the *between*-person level (Balzarini et al., 2020). We aimed to extend these findings by investigating whether stress experiences during the pandemic are negatively associated *within* individuals. To capture a daily fluctuating facet of relationship functioning, our study focused on the effect of daily stress on feelings of closeness towards the partner. Closeness is conceptualized as a momentary subjective experience reflecting psychological intimacy towards the partner

(Debrot et al., 2012). Since closeness mediates the association between daily hassles and marital quality (Harper et al., 2000), it can be regarded as an indicator for relationship functioning.

Stress and Relationship Functioning: Differentiating Between- and Within-Person Perspectives

Overall, research shows that daily stress is associated with impaired relationship functioning, such as decreased relationship satisfaction (Falconier, Nussbeck, et al., 2015; Harper et al., 2000; Ledermann et al., 2010). The negative effect of stress on relationship quality is also evident in the context of the COVID-19 pandemic (Balzarini et al., 2020). However, the majority of these studies are limited to investigating variations of stress and relationship functioning at the interindividual level, showing, for example, that those individuals who report more daily hassles are likely to also report lower marital quality (Harper et al., 2000). Differentiating *between* individuals, such as between-person findings therefore yield important insights into *who* might be at risk for decreased relationship functioning (i.e., those who are highly stressed). To achieve a more comprehensive understanding of stress effects, however, studies investigating intraindividual variations are important complements to these between-person studies. An intraindividual approach provides insight into whether fluctuations of stress are associated with fluctuations of relationship functioning *within* an individual, examining, for example, whether a person experiences lower relational wellbeing than they usually do at moments in which they are more stressed than usual. Therefore, such a within-person approach does not only inform *who*, but also *when* an individual might be at risk for decreased relationship functioning (i.e., when experiencing greater stress than usual).

Interestingly, prior research has shown that the association between stress and relationship functioning may be somewhat more complex when examined within individuals

(Hilpert et al., 2018; Milek et al., 2015; Williams & Parra, 2019). While some studies found that stress may (directly or indirectly) negatively impact relationship functioning on an intrapersonal level (Lavee & Ben-Ari, 2007; Sears et al., 2016), being more stressed than usual is not consistently associated with reduced relational wellbeing. For example, Hilpert et al. (2018) showed that women are most satisfied with their relationship on days when they are *more* stressed than usual *while* receiving partner support. Thus, the current state of research yields diverse findings regarding the association between stress and relationship outcomes on the intraindividual level. Consequently, further research disentangling between-person from within-person components is warranted to determine whether and to what extent stress is negatively associated with relationship functioning *within* individuals.

Coping with Stress Individually vs. Dyadically

The association between stress and relationship functioning may be impacted by the degree to which couples typically cope together (Bodenmann, 2005). Prior research suggests that dealing with stress as a dyad might be more beneficial for relationship functioning as compared to individual coping (Papp & Witt, 2010). Therefore, we examined whether the preference for shared (rather than individual) coping attenuates the negative association between daily stress and closeness. The mere *preference* for shared coping (as compared to *enacted* shared coping) may in itself represent an important relationship resource. Such a preference may indicate coping-related we-ness (i.e., perceiving the couple as a unit when it comes to dealing with stress) which in turn has been argued to promote relational resilience, since such a shared coping identity may represent a basis for enacted (shared) coping behavior (Fergus, 2015; Fergus & Skerrett, 2015).

A substantial body of research has demonstrated the beneficial effect of applying adaptive coping strategies at the couple level on intimate relationships (Falconier & Kuhn, 2019). For example, a recent meta-analysis revealed a strong correlation between shared

coping and relationship satisfaction (Falconier, Jackson, et al., 2015). One mechanism by which coping dyadically exerts its beneficial impact on relationships is its buffering effect on the negative consequences of stress. Several studies found that coping together as a couple can mitigate the detrimental consequences of stress on relationship functioning, for example, by promoting positive couple interactions and stress communication (Bodenmann, 2005; Breitenstein et al., 2018; Karademas & Roussi, 2017; Rusu et al., 2020; Xu et al., 2018).

Facing pandemic-related stressors may increase the importance of dealing with stress together as a couple: Societal lockdown measures may limit the feasibility of individual coping strategies, such as meeting friends or attending sports classes. At the same time, due to pandemic-related measures (including quarantine periods, home office, societal lockdowns) couples are more likely to be together at home while having to deal with pandemic-related stressors. Speaking to the importance of couple level coping in times of COVID-19, a recent study showed that perceiving one's partner as responsive to one's need for support was shown to mitigate the association between COVID-19-related stressors and poor relationship quality (Balzarini et al., 2020). Our study aims to extend these cross-sectional findings on stress and relationship functioning during the pandemic by including a within-person perspective. We assessed whether a general preference for shared coping may alleviate the negative association between stress and closeness in moments when partners see each other. Seeing the partner seems crucial in order to deal jointly with stress: Personal communication offers the possibility to engage in interpersonal coping strategies that require physical proximity, such as touch (Bodenmann et al., 2018; Debrot et al., 2013). Consequently, we distinguished between incidents in which individuals did vs. did not see their partner and hypothesized that a preference for shared coping may exert its buffering effect when individuals have in-person contact to their partner.

The Present Study

Drawing on the importance of within-person associations between stress and relationship functioning and the potentially beneficial influence of coping as a couple, we investigated whether daily experiences of subjective stress are negatively associated with closeness and whether a preference for coping dyadically attenuates this association. Therefore, we examined the following hypotheses: First, we expected to find a negative association between stress and closeness on both the between-person level and within-person level (H1). On the within-person level, we assumed that an individual who feels more stressed than they usually do, is likely to feel less close towards their partner than usual. On the between-person level, we expected that those individuals who are on average (i.e., across the whole study period) more stressed than others will on average (i.e., across the whole study period) feel less close towards their partner. Second, we hypothesized that a preference for coping as a couple (vs. individually) would buffer this negative association when having in-person contact with the partner (H2). To study our hypotheses, we ran a two-wave experience sampling study with seven days per wave and three assessments per day including 272 participants.

The present study contributes to the existing literature in several ways. First, considering that the within-person association of stress and relationship functioning is rarely investigated, we aim to contribute to the knowledge on such within-person associations. Second, by applying ambulatory assessment, we sought to capture people's momentary feelings, thereby increasing the ecological validity, which is often compromised in cross-sectional studies relying on a single time point of assessment. Finally, to capture a particularly stressful episode in people's everyday lives, we conducted our study during the COVID-19 pandemic when in Germany societal lockdown was enacted for the first time (German Federal Ministry of Health, 2020). This period of data collection therefore

represents an extraordinary setting for investigating the effects of daily stress on relationship functioning.

Methods

Participants

Recruitment of participants was based on placing advertisements at the institute and in public (students' blackboard of the department and German Facebook groups advertising participation in online studies). The inclusion criteria comprised sound German language skills and age of majority (18 years). Five hundred and thirty participants provided informed consent and started the study. For the present analyses, participants who did not indicate being in a committed romantic relationship were excluded. This resulted in a final sample of 272 participants (85% female) with a mean age of 27.7 years ($SD = 8.6$, range = [18; 70]). The majority indicated studying at university (63%), while only 23% were employed in paid jobs (full-time or part-time). On average, participants indicated being committed to their current romantic relationship for 5.5 years ($SD = 7.0$) and reported a mean relationship satisfaction assessed via the Relationship Assessment Scale (Hassebrauck, 1991; Hendrick, 1988) of 4.22 ($SD = 0.67$, scale range [1, 7]). The majority (71%) were living together with their partner. Of the 272 subjects who had participated in the first wave (yielding 4505 observations), approximately half ($N = 132$) took also part in the second wave (yielding 1872 observations). The average response rate was 79% in the first wave and 68% in the second wave with an average response time of 3.8 minutes per questionnaire. Response rates for the evening questionnaires were highest with 84% and 74% in wave 1 and wave 2, respectively. Missing entries were deleted listwise. Individuals who also participated in the second wave did not differ significantly from those who did not in any demographic characteristic, or in mean levels of stress, coping, partner contact, and closeness.

Procedure

This study was part of an experience sampling project that investigated the impact of online and offline contacts on different emotions and needs during the COVID-19 pandemic (see Supplemental Material for full set of measures). Participants provided informed consent before answering to any questionnaire. All questionnaires were implemented and administered using the formr survey framework (Arslan et al., 2020).

Before starting the experience sampling period, participants responded to a general questionnaire assessing demographic information and trait measures including coping preference and relationship satisfaction. Afterwards, they entered an experience sampling phase comprised of two waves of daily assessments with seven consecutive days each. The first wave was launched in April 2020 when social contact restrictions came into effect for the first time in history (i.e., individuals were only allowed to meet one individual of another household, e.g., the partner). The second wave started in May 2020, three weeks after the first wave was completed, when some social distancing measures were already lifted (German Federal Ministry of Health, 2020). During both waves, lockdown measures had a strong impact on people's daily lives. Schools and all non-essential facilities were closed, including restaurants, retail industry, hotels, and theatres. Further, people were not allowed to do any sports that required physical proximity to more than one person and indoors sports clubs were closed. Also, the work domain was affected: Citizens were instructed to work in home office where possible.

During both waves, participants received a link to the experience sampling questionnaire via text messages to their mobile phone three times a day at random time points within three predefined time frames between 9:00 am and 9:00 pm. The first text message was sent between 9:00 am and 11:00 am, the second between 2:00 pm and 4:00 pm, and the third between 7:00 pm and 9:00 pm. If participants did not respond to the first or the second

questionnaire within an hour, the corresponding link was deactivated to ensure that there would be a minimum interval of two hours between all assessments. The link to the third questionnaire was active until the end of the day. During each measurement, participants first reported on closeness, then stress, and finally face-to-face contact. At the end of each questionnaire, participants had the chance to unsubscribe from the study. As an incentive, participants were offered to take part in a raffle to win a voucher (25€). Each answered questionnaire counted as one lottery ticket. Thus, participants filling out all questionnaires during both waves had the highest chance to win. The study was approved by the ethics committee of the Department of Psychology of the University of Münster.

Measures

Closeness

To assess momentary feelings of closeness towards the partner, we used one item of the Intimacy Scale developed by Debrot et al. (2012). Participants were asked: “How close do you feel to your partner at the moment?”. Participants rated their momentary closeness on a seven-point rating scale ranging from (1) “not at all close” to (7) “very close”. The average level of closeness was 4.99 ($SD = 1.23$).

Stress

To assess momentary stress level, participants were asked: “How stressed do you feel at the moment?”. Participants rated their stress experience on a seven-point rating scale ranging from (1) “not at all stressed” to (7) “very stressed”. The average level of stress was 3.09 ($SD = 1.16$).

Partner Contact

To assess face-to-face contact with others, participants were asked: “With whom did you have in-person contact within the last two hours?”. The multiple-choice answering options included “stranger”, “acquaintance”, “friend”, “partner”, “family” and “other”. We

used a dummy coded variable to specify whether participants had had face-to-face contact with their partner (0 = no face-to-face contact; 1 = face-to-face contact) within the last two hours. On average, participants indicated having had in-person contact with their partner in half of the assessments as shown by the mean proportion of 0.51 ($SD = 0.34$). Participants also rated the interaction quality on a 7-point rating scale and indicated with whom they had had digital contact within the last two hours.

Coping Preference

To assess participants' preferred coping style (i.e., together vs. individually), we used a modified version of the IOS (Aron et al., 1992) based on Helgeson et al. (2017). Its association with several facets of communal coping (e.g., perception of a shared stressor, collaboration in problem solving) suggests that it may reflect a general preference for dealing with stress as a couple rather than individually (Helgeson & van Vleet, 2019).

We asked participants to rate the extent to which they cope with stress as a couple ("Stress can be dealt with individually or jointly. If you think of your relationship, which picture describes best how you and your partner typically deal with stress?"). Participants chose one out of the seven pictograms. The pictograms represented circles that were differentially overlapping, ranging from no overlapping (reflecting individual coping) to complete overlapping (reflecting coping as a unit). Each pictogram was assigned a score so that the resulting scale ranged from 1 (coping with stress individually) to 7 (coping with stress as a unit; $M = 4.70$, $SD = 1.44$).

Statistical Analyses

To test our hypotheses, we ran a multilevel model with random intercept and random slopes for all main effects. We included the entire sample (i.e., both waves) in our main analyses, including individuals who participated in the first wave only, as well as those who participated in both waves for two reasons. First, we wanted to increase power by collapsing

both waves. Second, both waves were expected to be similar: Individuals who participated in both waves did not differ significantly from those who did not in any demographic characteristic, or in mean levels of stress, coping, partner contact, and closeness. Further, while some measures were lifted, Wave 2 was still characterized by pandemic-related restrictions. Therefore, it can be assumed that the COVID-19 context did not differ substantially between Wave 1 and Wave 2. The results for the first and the second wave analyzed separately are reported in the Supplemental Material. The experience sampling assessments constituted Level 1 (L1, within-person level) and were nested within individuals on Level 2 (L2, between-person level). Stress and face-to-face partner contact were entered into the model as within- (L1) and between-person (L2) components. For the within-person component of face-to-face contact (L1), we preserved the original dummy coding in order to facilitate interpretation (0 = no face-to-face contact; 1 = face-to-face contact). To calculate the within-person component of stress (L1), the variable stress was person-mean centered. A deviation from zero can thus be interpreted as a deviation from the individual's own average stress level. The between-person components (L2) were extracted by grand-mean centering the within-person means of stress and face-to-face contact. By entering these between-person components into the model, we controlled for deviations of an individual's average level of stress and face-to-face contact from the mean level across all individuals. Coping preference represents a Level 2 variable. The score was grand-mean centered for each individual. The outcome variable closeness (Level 1) was neither transformed nor centered. To account for potential (linear) trends of the outcome over time and wave, we included *day* as a control variable across both waves. Day was not centered and reflects a continuous count from the first day of participation onwards until the end of wave 2.

In the final model, we regressed closeness on day, between-person stress, within-person stress, between-person face-to-face contact, within-person face-to-face contact, coping

preference, and the respective two- and three-way interaction terms between within-person stress, within-person face-to-face contact and coping preference. The intercept and all Level 1 main effects (day, within-person stress, and within-person face-to-face contact) were allowed to vary randomly between participants, and random effects were allowed to covary. In addition, we controlled for first-order residual autocorrelation and several potentially confounding variables (age, gender, relationship satisfaction, cohabitation). In secondary analyses, we tested whether results hold also for the digital mode of contact differentiating between no partner contact at all, digital contact only, face-to-face contact only, face-to-face contact *and* digital contact. All analyses were carried out using the software R version 3.6.1 and the multilevel random effects model was estimated using the package nlme version 3.1-142 (Pinheiro et al., 2020).

Results

Preliminary Analyses

The intraclass correlations of closeness ($ICC = .49$), stress ($ICC = .41$), and face-to-face contact ($ICC = .37$) indicated that these variables varied on a within-person as well as on a between-person level. First, raw data were visualized (see Figure S1, Supplemental Material). Visual inspection of the raw data on a within-person level suggested a negative association between stress and closeness for many participants, and illustrated a considerable variability across participants. Similar effects were found on the aggregated between-person level (see Figure S2, Supplemental Material).

Main Analyses

Confirming our first hypothesis (H1), the estimates for the fixed effects revealed a negative association between stress and closeness on a between-person level ($b = -0.18$, $CI_{95} [-0.28, -0.07]$, $p < .001$) as well as on a within-person level ($b = -0.12$, $CI_{95} [-0.16, -0.08]$, $p <$

.001; see Table 1 for all fixed effects). The between-person effect describes that those who (on average) felt more stressed reported (on average) lower levels of closeness, while the within-person effect means that in a moment when an average person reported to feel more stressed than usual, they also reported to feel less close towards their partner (see Figure 1).

It should be noted that the random effects of within-person stress point to a substantial variability between subjects ($SD = 0.15$, see Table 2). While some participants experienced a pronounced effect of stress, other subjects experienced none or even reported increased feelings of closeness when feeling more stressed than usual (see Figure 1). To visualize this variability, we plotted the raw data and fitted regression lines of stress on closeness for those subjects whose random stress slopes revealed the most negative vs. most positive association of stress with closeness (see Figure 2).

In line with our second hypothesis (H2), we found a significant three-way interaction effect between within-person stress, within-person face-to-face contact, and coping preference ($b = 0.04$, $CI_{95} [0.01, 0.07]$, $p = .004$). While a high preference for coping dyadically did not entirely buffer the negative association between stress and closeness when there was face-to-face contact, a mitigating effect was evident (see Figure 3). Such a buffering effect, however, was not found when individuals had not seen their partner.

In addition to the results related to our hypotheses, we found several significant main effects. A preference for coping dyadically was positively associated with closeness ($b = 0.34$, $CI_{95} [0.23, 0.45]$, $p = <.001$). This indicates that participants who reported greater preference for coping dyadically overall experienced greater closeness towards their partner. Furthermore, on a within-person level, but not on a between-person level, face-to-face contact and closeness were positively associated ($b = 0.91$, $CI_{95} [0.78, 1.04]$, $p = <.001$), indicating that at moments in which participants had seen their partner, they felt closer to them. Regarding linear changes in time, the control variable day had a significant effect on

closeness, indicating that closeness increased over time. Of the remaining control variables (age, gender, relationship satisfaction, cohabitation), only relationship satisfaction significantly predicted closeness, such that higher relationship satisfaction was positively associated with overall closeness. The full model including all control variables is reported in the Supplemental Material (Table S3).

Finally, to examine the relevance of in-person contact regarding the buffering effect of coping preference, we ran additional models including a two-way interaction between within-person stress and coping preference in different subgroups defined by the type of partner contact (i.e., no partner contact at all, digital contact only, face-to-face contact only, and face-to-face contact *and* digital contact). Underlining our assumption about the importance of in-person contact, the interaction between stress and coping was only significant in both face-to-face contact subgroups. We further explored whether interaction quality would influence the interaction between coping preference and stress to further disentangle the mechanisms underlying the buffering effect of coping preference. Therefore, we included a three-way interaction between stress, coping, and interaction quality in both face-to-face subgroups. While the three-way interaction was not significant in the face-to-face contact *and* digital contact subgroup, a significant effect was evident in the face-to-face contact only subgroup ($p = .029$). This three-way interaction indicates that the buffering effect of a preference to deal with stress together as a couple was more pronounced when interaction quality was high (vs. low; see Figure S3, Supplemental Material). However, since random effects for interaction quality had to be excluded due to model convergence issues, these exploratory results should be interpreted with caution.

Discussion

Summary of Findings

In the present study, we investigated the effect of daily stress on relational closeness. In addition, we examined the moderating role of the general preference to cope with stress as a couple (rather than individually). In line with our first hypothesis, we found a negative association between daily stress and closeness. Specifically, we demonstrated this effect both on a between-person and within-person level. Participants who on average reported to experience more stress experienced lower levels of closeness towards their romantic partner. Furthermore, at moments in which people experienced more stress than usual, they felt less close to their partner. Importantly, the effect of stress on closeness varied considerably across participants, meaning that for some participants stress was associated with increased feelings of closeness (see Figure 2). Moreover, we found support for our second hypothesis. Coping preference moderated the association between stress and closeness when partners had seen each other: In case of in-person contact, the negative effect of stress on closeness was more pronounced for those participants who reported a low (as compared to high) degree of coping with stress as a couple.

Stress and Relationship Functioning

The present study confirms the negative effect of daily stress on relationship functioning on the between- and within-person level, thus complementing previous cross-sectional research (Ledermann et al., 2010). Specifically, our within-person findings demonstrate that increases in stress are associated with decreases in closeness. Such an effect of stress on closeness may be indicative of broader negative relationship outcomes: Earlier work has shown that intimacy (including closeness) mediates the association between daily hassles and marital satisfaction (Debrot et al., 2012; Harper et al., 2000). Thus, reductions in

closeness, which may be temporary in nature, might impact more stable relationship outcomes, such as relationship quality. On the other hand, while a negative effect of stress on closeness represents a plausible explanation of the current findings, due to the cross-sectional nature of our results, findings may be interpreted the other way around: Considering that experiencing partner closeness reduces psychological and physical stress (Ditzen et al., 2019; Jakubiak & Feeney, 2016), partner closeness may in fact be buffering one's response to stress. Most likely, however, the association between stress and closeness is driven by a more complex pattern, such that daily stress and closeness experienced towards the partner mutually influence one another (Robles et al., 2014).

Notably, our results should be viewed in light of the COVID-19 pandemic, since the data were collected during the first societal lockdown in Germany. Recent, large-scale research shows that pandemic-related stressors, including increased stress during lockdown, may negatively impact relationship quality on the between-person level (Balzarini et al., 2020; Randall et al., 2021). Our results suggest that the association between stress during lockdown and decreased relationship functioning is also evident within individuals, thereby complementing previous interindividual findings: Stress experiences fluctuate during lockdown and these fluctuations are accompanied by fluctuations in experienced closeness towards the romantic partner.

While the within-person effect of stress on closeness was small in size ($b = -0.12$), we wish to note that even small moment-to-moment effects are potentially relevant and can have long-term repercussions if they accumulate over time (Karney et al., 2005). Nevertheless, our results need to be interpreted against the background of the large heterogeneity ($\sigma = 0.15$): This substantial heterogeneity indicates that a considerable proportion of our sample actually did not exhibit a negative association between stress and closeness. As depicted in Figures 1 and 2, stress might even increase feelings of closeness for some individuals. The large

variability suggests that other relational resources, such as perceived partner support or the amount of time spent together, may determine whether stress promotes or decreases relational wellbeing within individuals (Hilpert et al., 2018; Milek et al., 2015). In line with this idea, Pietromonaco and Overall (2020) suggest that the COVID-19 pandemic is likely to enhance variability in relationship dynamics, arguing that the stressors associated with the pandemic hold the potential for both relationship growth and decline. Stress may exert positive effects on relationship functioning by activating individual and relational resources. If couples successfully manage the imposed stressors, their resources may grow and their relationship may thrive. Personal or relational vulnerabilities, on the other hand, may increase the deteriorating effect of stress on relationship functioning. It should be noted, however, that we investigated the effect of subjective stress experiences *during* and not explicitly *due* to the pandemic. Therefore, we cannot draw the conclusion that our results reflect solely pandemic-related stress.

Perceiving Coping as a Shared Effort

Our study suggests that the degree to which individuals prefer to cope together with their partner (rather than individually) may alleviate the negative association between stress and closeness. This finding complements previous studies on the importance of dealing with stress together with the partner in daily life (Hilpert et al., 2018) as well in times of lockdown (Balzarini et al., 2020; Randall et al., 2021). Specifically, our findings suggest that a *preference* for shared coping may in itself represent an important relational resource, potentially stimulating *enacted* mutual coping behaviors. Our results therefore support the assumption that perceiving the couple as a (coping) unit strengthens relational resilience (Fergus, 2015).

Nevertheless, it should be noted that the buffering effect of a preference for shared coping was only evident when partners had in-person contact. This finding may be explained

by the importance of in-person contact for fostering feelings of support (Petrova & Schulz, 2021). Moreover, the time of data collection (i.e., societal lockdown) may partially account for the moderating effect of in-person contact. During lockdown, individual coping strategies, such as sports classes or outings with friends, are limited. At the same time, partners are more likely to spend more time together at home, particularly when living together. Our results suggest that this is where the preference for shared (rather than individual coping) exerts its beneficial effect: Being stuck together (e.g., due to lockdown) may increase the importance of coping together as a couple.

Limitations, Future Directions, and Strengths

There are several limitations that need to be considered with regards to the interpretability and generalizability of our results. First, our findings rely on cross-sectional analyses. Therefore, no causal inferences can be drawn and it cannot be excluded that our observed effects may flow in the opposite direction, since experiencing partner closeness may decrease psychological and physiological stress (Ditzen et al., 2019; Jakubiak & Feeney, 2016). Most likely, however, the association between stress and closeness follows a bidirectional pattern (Robles et al., 2014). Furthermore, third-order factors may impact both stress and closeness independently, and thereby partially account for the observed association between stress and closeness. For example, being quarantined during the pandemic may reduce personal partner contact and feelings of closeness, while increasing stress experiences. Future studies should aim to disentangle bidirectional and third-order associations between stress and closeness.

Further, it should be mentioned that we measured our focal constructs with a single item. While this does not allow us to draw conclusions about the reliability of our measures, we opted for this approach in order to minimize participant burden, as is common practice in

experience sampling studies (Kirtley et al., 2021). Ideally, future research should replicate our findings using multiple items.

Another methodological limitation concerns our assessment of coping. We did not assess enacted coping behavior, but a general preference for dealing with stress as a couple (rather than individually). Therefore, this measure does not allow conclusions regarding specific interpersonal coping strategies. Future studies should replicate our findings using questionnaires differentiating between different coping behaviors (Bodenmann et al., 2018; Swerdlow & Johnson, 2020) or other innovative means of reliable assessment methods, such as mobile sensing or behavioral observation using an electronically activated recorder (Mehl, 2017). A major advantage of the latter techniques is that they enable collecting intensive longitudinal data while decreasing participant burden. Beyond mere replication, such novel assessment methods offer the opportunity for more in-depth investigations of specific relationship processes on a daily basis. For example, while we assessed coping preference as a trait, one's coping style might actually fluctuate depending on the level of stress (Rusu et al., 2020). Moreover, the feeling of closeness to the partner may influence the preference for coping individually or as a couple. The relationship between stress, coping, and closeness may thus be more complex than represented in this study. Further research could shed light on how stress and closeness shape the quantity and quality of shared coping efforts and which shared coping strategies prove to be most efficient in mitigating negative effects of stress on relationship functioning. In addition, a network approach (Bringmann et al., 2013) may offer the opportunity to explore the interdependence between multiple relationship constructs and a variety of shared coping strategies.

Moreover, interesting insights may be gained by contrasting different stressors and their origin. For example, our stress measure does not differentiate between stress originating inside versus outside of the relationship. This represents a limitation considering that our

conclusions refer to feelings of stress in daily life and not to stress arising from the relationship. However, given that individual stress experiences outside the relationship often turn into stress related to the relationship (Randall & Bodenmann, 2009), such a differentiation might be hard to make by lay participants. Relatedly, future research may investigate the impact of specific stressors arising from different domains (e.g., work stress vs. home stress), for example comparing the within-person effect of family vs. work stressors on relationship functioning.

Lastly, our study only included one romantic partner, rather than both couple members. Future studies employing a dyadic approach might yield further insight into the dynamics of stress in the context of intimate relationships. For example, crossover processes represent a potential consequence of intraindividual stress effects (Bolger et al., 1989; Debrot et al., 2018): One partner's stress might not only negatively impact their own closeness experienced towards their partner, but also their partner's feeling of closeness. Furthermore, couple data would enable to examine whether congruence between both partners' coping preference may influence the buffering effect of dyadic coping.

Beyond these limitations, we believe the present work is characterized by several strengths. By employing an experience sampling protocol, we captured participants' momentary feelings of stress and closeness, thus increasing the ecological validity compared to one-time, cross-sectional assessments. Furthermore, our design allowed us to draw conclusions on within-person associations, which can differ from between-person associations (Hilpert et al., 2018). Finally, our data collection was conducted during the first societal lockdown in the course of the COVID-19 pandemic. Such extraordinary circumstances, in which individuals are confronted with drastic changes in their everyday lives, yield an interesting setting for data collection considering the generally increased stress levels (Cénat et al., 2021).

Conclusion and Practical Implications

Taken together, we replicated the negative effect of daily stress on relationship functioning in the context of romantic relationships. Notably, we demonstrated this association on both the between- and within-person level. Those individuals who are generally more stressed, on average feel less close towards their partner. Further, at moments when individuals feel more stressed than they usually do, they also experience less closeness towards their partner. This within-person finding suggests that momentary stress reductions may benefit relational closeness. For example, ecological momentary interventions (Heron & Smyth, 2010) prompted when an individual is more stressed than usual may reduce the risk for decreased relationship functioning.

Moreover, our findings indicate that shared coping efforts constitute one way of mitigating the negative association between stress and closeness. Therefore, we propose encouraging couples to participate in couple intervention programs that target joint coping strategies, such as the Couples Coping Enhancement Training (Bodenmann et al., 2001). Facing the current pandemic, digital, short-term interventions might be cost-effective measures to prevent aggravated effects of stress on relationship functioning. Delivering such intervention programs digitally might lower the inhibition threshold to participate, broadens the availability of the program, and ensures safety when the incident rate of COVID-19 is high (Doss et al., 2020).

References

- Aron, A., Aron, E. N., & Smollan, D. (1992). Inclusion of other in the self scale and the structure of interpersonal closeness. *Journal of Personality and Social Psychology*, 63(4), 596–612. <https://doi.org/10.1037/0022-3514.63.4.596>
- Arslan, R. C., Walther, M. P., & Tata, C. S. (2020). Formr: A study framework allowing for automated feedback generation and complex longitudinal experience-sampling studies using R. *Behavior Research Methods*, 52(1), 376–387. <https://doi.org/10.3758/s13428-019-01236-y>
- Balzarini, R. N., Muise, A., Zoppolat, G., Di Bartolomeo, A., Rodrigues, D. L., Alonso-Ferres, M., Urganci, B., Debrot, A., Pichayayothin, N. B., Dharma, C., Chi, P., Karremans, J., Schoebi, D., & Slatcher, R. B [Richard Bennett]. (2020). *Love in the time of covid: Perceived partner responsiveness buffers people from lower relationship quality associated with covid-related stressors*. <https://doi.org/10.31234/osf.io/e3fh4>
- Bates, D., Mächler, M., Bolker, B., & Walker, S. (2015). Fitting Linear Mixed-Effects Models Using lme4. *Journal of Statistical Software*, 67(1). <https://doi.org/10.18637/jss.v067.i01>
- Bodenmann, G. (2005). Dyadic coping and its significance for marital functioning. In T. A. Revenson, K. Kayser, & G. Bodenmann (Eds.), *Couples coping with stress: Emerging perspectives on dyadic coping* (pp. 33–49). American Psychological Association. <https://doi.org/10.1037/11031-002>
- Bodenmann, G., Arista, L. J., Walsh, K. J., & Randall, A. K. (2018). Dyadic coping inventory. In J. Lebow, A. Chambers, & D. C. Breunlin (Eds.), *Encyclopedia of Couple and Family Therapy* (pp. 1–5). Springer International Publishing. https://doi.org/10.1007/978-3-319-15877-8_678-1

- Bodenmann, G., Charvoz, L., Cina, A., & Widmer, K. (2001). Prevention of marital distress by enhancing the coping skills of couples: 1-year follow-up-study. *Swiss Journal of Psychology, 60*(1), 3–10.
- Bolger, N., DeLongis, A., Kessler, R. C., & Wethington, E. (1989). The contagion of stress across multiple roles. *Journal of Marriage and the Family, 51*(1), 175.
<https://doi.org/10.2307/352378>
- Breitenstein, C. J., Milek, A., Nussbeck, F. W., Davila, J., & Bodenmann, G. (2018). Stress, dyadic coping, and relationship satisfaction in late adolescent couples. *Journal of Social and Personal Relationships, 35*(5), 770–790.
<https://doi.org/10.1177/0265407517698049>
- Bringmann, L. F., Vissers, N., Wichers, M., Geschwind, N., Kuppens, P., Peeters, F., Borsboom, D., & Tuerlinckx, F. (2013). A network approach to psychopathology: New insights into clinical longitudinal data. *PloS One, 8*(4), e60188.
<https://doi.org/10.1371/journal.pone.0060188>
- Carroll, N., Sadowski, A., Laila, A., Hruska, V., Nixon, M., Ma, D. W. L., & Haines, J. (2020). The impact of COVID-19 on health behavior, stress, financial and food security among middle to high income Canadian families with young children. *Nutrients, 12*(8). <https://doi.org/10.3390/nu12082352>
- Cénat, J. M., Blais-Rochette, C., Kokou-Kpolou, C. K., Noorishad, P.-G., Mukunzi, J. N., McIntee, S.-E., Dalexis, R. D., Goulet, M.-A., & Labelle, P. R. (2021). Prevalence of symptoms of depression, anxiety, insomnia, posttraumatic stress disorder, and psychological distress among populations affected by the COVID-19 pandemic: A systematic review and meta-analysis. *Psychiatry Research, 295*, 113599.
<https://doi.org/10.1016/j.psychres.2020.113599>

- Debrot, A., Cook, W. L., Perrez, M., & Horn, A. B. (2012). Deeds matter: Daily enacted responsiveness and intimacy in couples' daily lives. *Journal of Family Psychology : JFP : Journal of the Division of Family Psychology of the American Psychological Association (Division 43)*, 26(4), 617–627. <https://doi.org/10.1037/a0028666>
- Debrot, A., Schoebi, D., Perrez, M., & Horn, A. B. (2013). Touch as an interpersonal emotion regulation process in couples' daily lives: The mediating role of psychological intimacy. *Personality & Social Psychology Bulletin*, 39(10), 1373–1385. <https://doi.org/10.1177/0146167213497592>
- Debrot, A., Siegler, S., Klumb, P. L., & Schoebi, D. (2018). Daily work stress and relationship satisfaction: Detachment affects romantic couples' interactions quality. *Journal of Happiness Studies*, 19(8), 2283–2301. <https://doi.org/10.1007/s10902-017-9922-6>
- Ditzen, B., Germann, J., Meuwly, N., Bradbury, T. N., Bodenmann, G., & Heinrichs, M. (2019). Intimacy as related to cortisol reactivity and recovery in couples undergoing psychosocial Stress. *Psychosomatic Medicine*, 81(1), 16–25. <https://doi.org/10.1097/PSY.0000000000000633>
- Doss, B. D., Knopp, K., Roddy, M. K., Rothman, K., Hatch, S. G., & Rhoades, G. K. (2020). Online programs improve relationship functioning for distressed low-income couples: Results from a nationwide randomized controlled trial. *Journal of Consulting and Clinical Psychology*, 88(4), 283–294. <https://doi.org/10.1037/ccp0000479>
- Falconier, M. K., Jackson, J. B., Hilpert, P., & Bodenmann, G. (2015). Dyadic coping and relationship satisfaction: A meta-analysis. *Clinical Psychology Review*, 42, 28–46. <https://doi.org/10.1016/j.cpr.2015.07.002>

- Falconier, M. K., & Kuhn, R. (2019). Dyadic coping in couples: A conceptual integration and a review of the empirical literature. *Frontiers in Psychology, 10*, 571.
<https://doi.org/10.3389/fpsyg.2019.00571>
- Falconier, M. K., Nussbeck, F., Bodenmann, G., Schneider, H., & Bradbury, T. (2015). Stress from daily hassles in couples: Its effects on intradyadic stress, relationship satisfaction, and physical and psychological well-being. *Journal of Marital and Family Therapy, 41*(2), 221–235. <https://doi.org/10.1111/jmft.12073>
- Fergus, K. (2015). Theoretical and methodological underpinnings of resilience in couples: Locating the ‘we’. In K. Skerrett & K. Fergus (Eds.), *Couple Resilience* (pp. 23–42). Springer Netherlands. https://doi.org/10.1007/978-94-017-9909-6_2
- Fergus, K., & Skerrett, K. (2015). Resilient Couple Coping Revisited: Building Relationship Muscle. In K. Skerrett & K. Fergus (Eds.), *Couple Resilience* (pp. 199–210). Springer Netherlands. https://doi.org/10.1007/978-94-017-9909-6_11
- German Federal Ministry of Health. (2020). *Coronavirus SARS-CoV-2: Chronik der bisherigen Maßnahmen*.
<https://www.bundesgesundheitsministerium.de/coronavirus/chronik-coronavirus.html>
- Harper, J. M., Schaalje, B. G., & Sandberg, J. G. (2000). Daily hassles, intimacy, and marital quality in later life marriages. *The American Journal of Family Therapy, 28*(1), 1–18.
<https://doi.org/10.1080/019261800261770>
- Hassebrauck, M. (1991). ZIP – Ein Instrument zur Erfassung der Zufriedenheit in Paarbeziehungen [ZIP – A scale for assessment of satisfaction in close relationships]. *Zeitschrift Für Sozialpsychologie, 22*, 256–259.
- Helgeson, V. S., Jakubiak, B., Seltman, H., Hausmann, L., & Korytkowski, M. (2017). Implicit and explicit communal coping in couples with recently diagnosed type 2

diabetes. *Journal of Social and Personal Relationships*, 34(7), 1099–1121.

<https://doi.org/10.1177/0265407516669604>

Helgeson, V. S., & van Vleet, M. (2019). Short report: Inclusion of other in the self scale: An adaptation and exploration in a diverse community sample. *Journal of Social and Personal Relationships*, 36(11-12), 4048–4056.

<https://doi.org/10.1177/0265407519848491>

Hendrick, S. S. (1988). A generic measure of relationship satisfaction. *Journal of Marriage and the Family*, 50(1), 93. <https://doi.org/10.2307/352430>

Heron, K. E., & Smyth, J. M. (2010). Ecological momentary interventions: Incorporating mobile technology into psychosocial and health behaviour treatments. *British Journal of Health Psychology*, 15(Pt 1), 1–39. <https://doi.org/10.1348/135910709X466063>

Hilpert, P., Xu, F., Milek, A., Atkins, D. C., Bodenmann, G., & Bradbury, T. N. (2018).

Couples coping with stress: Between-person differences and within-person processes. *Journal of Family Psychology*, 32(3), 366–374. <https://doi.org/10.1037/fam0000380>

Jakubiak, B. K., & Feeney, B. C. (2016). Keep in touch: The effects of imagined touch support on stress and exploration. *Journal of Experimental Social Psychology*, 65, 59–67. <https://doi.org/10.1016/j.jesp.2016.04.001>

Karademas, E. C., & Roussi, P. (2017). Financial strain, dyadic coping, relationship satisfaction, and psychological distress: A dyadic mediation study in Greek couples. *Stress and Health : Journal of the International Society for the Investigation of Stress*, 33(5), 508–517. <https://doi.org/10.1002/smi.2735>

Karney, B. R., Story, L. B., & Bradbury, T. N. (2005). Marriages in context: Interactions between chronic and acute stress among newlyweds. In T. A. Revenson, K. Kayser, & G. Bodenmann (Eds.), *Couples coping with stress: Emerging perspectives on dyadic*

coping (pp. 13–32). American Psychological Association.

<https://doi.org/10.1037/11031-001>

Kirtley, O., Hiekkaranta, A. P., Kunkels, Y. K., Eisele, G., Verhoeven, D., van Nierop, M., Myin-Germeys, I., & Lüken, M. (2021). *The experience sampling method (ESM) item repository*. <https://doi.org/10.17605/OSF.IO/KG376>

Klaiber, P., Wen, J. H., DeLongis, A., & Sin, N. L. (2020). The ups and downs of daily life during COVID-19: Age differences in affect, stress, and positive events. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences*. Advance online publication. <https://doi.org/10.1093/geronb/gbaa096>

Lavee, Y., & Ben-Ari, A. (2007). Relationship of dyadic closeness with work-related stress: a daily diary study. *Journal of Marriage and the Family*, *69*(4), 1021–1035. <https://doi.org/10.1111/j.1741-3737.2007.00428.x>

Lazarus, R. S. (1993). From psychological stress to the emotions: A history of changing outlooks. *Annual Review of Psychology*, *44*, 1–21. <https://doi.org/10.1146/annurev.ps.44.020193.000245>

Lazarus, R. S. (1999). *Stress and emotion: A new synthesis*. Springer. <http://osna.ebib.com/patron/FullRecord.aspx?p=435140>

Ledermann, T., Bodenmann, G., Rudaz, M., & Bradbury, T. N. (2010). Stress, communication, and marital quality in couples. *Family Relations*, *59*(2), 195–206. <https://doi.org/10.1111/j.1741-3729.2010.00595.x>

Luetke, M., Hensel, D., Herbenick, D., & Rosenberg, M. (2020). Romantic relationship conflict due to the COVID-19 pandemic and changes in intimate and sexual behaviors in a nationally representative sample of American adults. *Journal of Sex & Marital Therapy*, 1–16. <https://doi.org/10.1080/0092623X.2020.1810185>

- Lyons, R. F., Mickelson, K. D., Sullivan, M. J., & Coyne, J. C. (1998). Coping as a communal process. *Journal of Social and Personal Relationships, 15*(5), 579–605. <https://doi.org/10.1177/0265407598155001>
- Mehl, M. R. (2017). The electronically activated recorder (EAR): A method for the naturalistic observation of daily social behavior. *Current Directions in Psychological Science, 26*(2), 184–190. <https://doi.org/10.1177/0963721416680611>
- Milek, A., Butler, E. A., & Bodenmann, G. (2015). The interplay of couple's shared time, women's intimacy, and intradyadic stress. *Journal of Family Psychology, 29*(6), 831–842. <https://doi.org/10.1037/fam0000133>
- Papp, L. M., & Witt, N. L. (2010). Romantic partners' individual coping strategies and dyadic coping: Implications for relationship functioning. *Journal of Family Psychology, 24*(5), 551–559. <https://doi.org/10.1037/a0020836>
- Petrova, K., & Schulz, M. (2021). *Emotional experiences in digitally mediated and in-person interactions: An experience-sampling study*. PsyArXiv. <https://doi.org/10.31234/osf.io/2teu5>
- Pietromonaco, P. R., & Overall, N. C. (2020). Applying relationship science to evaluate how the COVID-19 pandemic may impact couples' relationships. *The American Psychologist*. Advance online publication. <https://doi.org/10.1037/amp0000714>
- Pinheiro, J., Bates, D., DebRoy, S., Sarkar, D., Heisterkamp, S., & van Willigen, B. (2020). *nlme: Linear and nonlinear mixed effects models*. <https://CRAN.R-project.org/package=nlme>
- Randall, A. K., & Bodenmann, G. (2009). The role of stress on close relationships and marital satisfaction. *Clinical Psychology Review, 29*(2), 105–115. <https://doi.org/10.1016/j.cpr.2008.10.004>

- Randall, A. K., Leon, G., Basili, E., Martos, T., Boiger, M., Baldi, M., Hocker, L., Kline, K., Masturzi, A., Aryeetey, R., Bar-Kalifa, E., Boon, S. D., Botella, L., Burke, T., Carnelley, K., Carr, A., Dash, A., Fitriana, M., Gaines, S. O., . . . Chiarolanza, C. (2021). Coping with global uncertainty: Perceptions of COVID-19 psychological distress, relationship quality, and dyadic coping for romantic partners across 27 countries. *Journal of Social and Personal Relationships*, 026540752110342. <https://doi.org/10.1177/02654075211034236>
- Robles, T. F., Slatcher, R. B [Richard B.], Trombello, J. M., & McGinn, M. M. (2014). Marital quality and health: A meta-analytic review. *Psychological Bulletin*, 140(1), 140–187. <https://doi.org/10.1037/a0031859>
- Rodríguez-Rey, R., Garrido-Hernansaiz, H., & Collado, S. (2020). Psychological impact and associated factors during the initial stage of the coronavirus (COVID-19) pandemic among the general population in Spain. *Frontiers in Psychology*, 11, 1540. <https://doi.org/10.3389/fpsyg.2020.01540>
- Rusu, P. P., Nussbeck, F. W., Leuchtman, L., & Bodenmann, G. (2020). Stress, dyadic coping, and relationship satisfaction: A longitudinal study disentangling timely stable from yearly fluctuations. *PloS One*, 15(4), e0231133. <https://doi.org/10.1371/journal.pone.0231133>
- Sears, M. S., Repetti, R. L., Robles, T. F., & Reynolds, B. M. (2016). I just want to be left alone: Daily overload and marital behavior. *Journal of Family Psychology : JFP : Journal of the Division of Family Psychology of the American Psychological Association (Division 43)*, 30(5), 569–579. <https://doi.org/10.1037/fam0000197>
- Shanahan, L., Steinhoff, A., Bechtiger, L., Murray, A. L., Nivette, A., Hepp, U., Ribeaud, D., & Eisner, M. (2020). Emotional distress in young adults during the COVID-19

pandemic: Evidence of risk and resilience from a longitudinal cohort study.

Psychological Medicine, 1–10. <https://doi.org/10.1017/S003329172000241X>

Swerdlow, B. A., & Johnson, S. L. (2020). The interpersonal regulation interaction scale (IRIS): A multistudy investigation of receivers' retrospective evaluations of interpersonal emotion regulation interactions. *Emotion*. Advance online publication. <https://doi.org/10.1037/emo0000927>

Williams, D. T., & Parra, G. R. (2019). The longitudinal and bidirectional association between parenting stress and couples' relationship quality. *Personal Relationships*, 26(4), 713–732. <https://doi.org/10.1111/pere.12301>

Xu, F., Hilpert, P., Nussbeck, F. W., & Bodenmann, G. (2018). Testing stress and dyadic coping processes in Chinese couples. *International Journal of Stress Management*, 25(1), 84–95. <https://doi.org/10.1037/str0000051>

Table 1

Fixed Effects Estimates for Multilevel Model of Closeness as a Function of Stress, Face-to-Face Partner Contact, and Coping Preference

Fixed effects	Estimate (b)	SE	p	CI ₉₅	
				Lower	Upper
Intercept	4.42	0.08	<.001	4.26	4.57
Day	0.01	0.00	<.001	0.01	0.01
Stress_w	-0.12	0.02	<.001	-0.16	-0.08
F2f_w	0.91	0.06	<.001	0.78	1.04
Stress_b	-0.18	0.05	<.001	-0.28	-0.07
F2f_b	-0.16	0.19	.409	-0.54	0.22
Coping Preference	0.34	0.05	<.001	0.23	0.45
Stress_w by f2f_w	-0.13	0.02	<.001	-0.18	-0.09
Stress_w by CP	-0.01	0.01	.479	-0.03	0.02
F2f_w by CP	-0.06	0.04	.172	-0.14	0.03
Stress_w by f2f_w by CP	0.04	0.02	.004	0.01	0.07

Note. $N = 272$ participants, 6377 observations. CI₉₅: 95% confidence interval. Stress_w: within-person component of stress (subject mean centered, original range: [1, 7], centered range: [-4.29, 5.03]). F2f_w: within-person component of face-to-face contact, dummy coded (0 = no face-to-face contact, 1 = face-to-face contact). Stress_b: between-person component of stress (subject mean, grand mean centered). F2f_b: between-person component of face-to-face contact (subject mean proportion, grand mean centered). CP: Coping Preference; preference to cope together as a couple (high values) rather than individually (low values);

grand mean centered, original range: [1, 7], centered range: [-3.7, 2.3]). All p -values are two-tailed.

Table 2

Random Effects Estimates (SDs) for Multilevel Model of Closeness as a Function of Stress, Face-to-Face Partner Contact, and Coping Preference

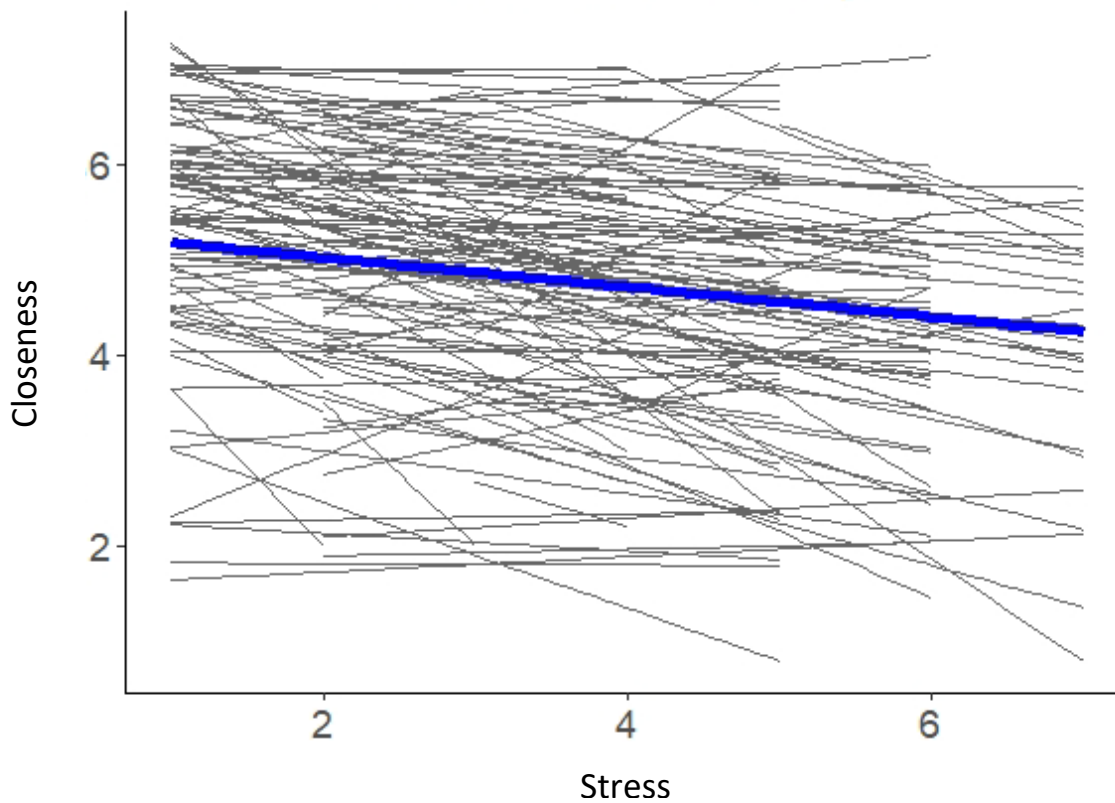
	Estimate	Correlation*		
Level 2 (between-person)*		Intercept	Stress_w	F2f_w
Intercept	1.15			
Stress_w	0.15	.19		
F2f_w	0.77	-.69	-.14	
Day	0.02	-.12	-.04	-.16
Level 1 (within-person)				
Residual (<i>SD</i>)	0.99			
Autocorrelation	0.19			

*Note. Note. N = 272 participants, 6377 observations. Stress_w: within-person component of stress (subject mean centered, original range: [1, 7], centered range: [-4.29, 5.03]). F2f_w: within-person component of face-to-face contact, dummy coded (0 = no face-to-face contact, 1 = face-to-face contact). Level 2 estimates and residual estimate represent standard deviations. *To our knowledge, random effects p -values cannot be obtained from lme-objects. Therefore, we repeated the multilevel modeling using the package lme4 version 1.1-21 (Bates et al., 2015) and calculated an ANOVA-like table for random effects with single*

term deletion. Results suggested that all random effects were significant, whereas their covariances were not.

Figure 1

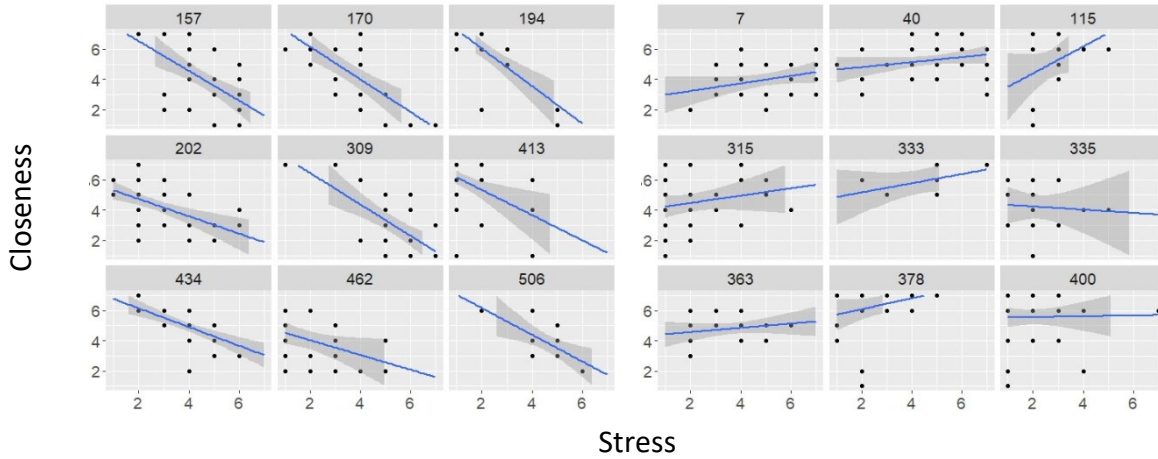
Average (Thick) and Subject-Specific (Thin) Regression Lines for Closeness as a Function of Stress



Notes. $N = 272$ participants. Stress and closeness were rated on a 7-point rating scale with higher values reflecting greater stress and closeness.

Figure 2

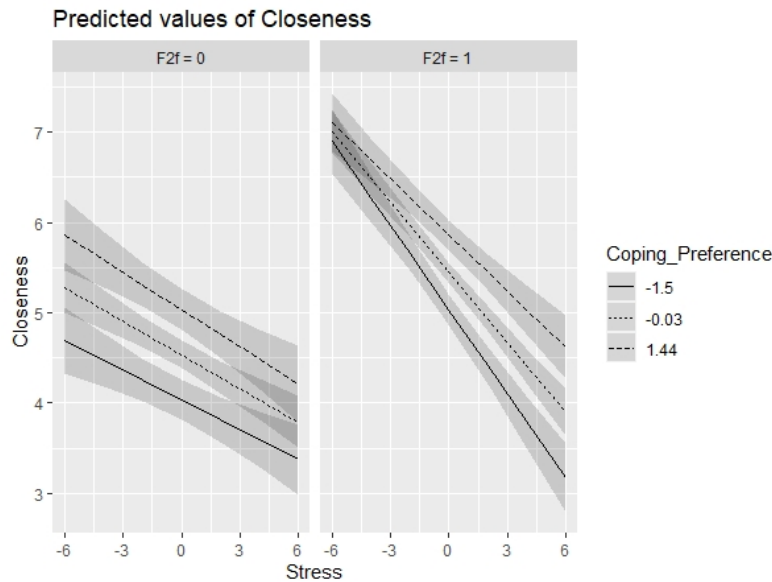
Raw Data and Fitted Regression Lines of Closeness on Stress for a Subset of Subjects



Note. Plots show raw data with fitted regression lines for those participants whose random stress slopes were most negative (left panel) or most positive (right panel). 95 % confidence intervals are grayed out. Stress and closeness were rated on a 7-point rating scale with higher values reflecting greater stress and closeness.

Figure 3

Interaction Plot of Closeness as a Function of Stress, Coping Preference, and Face-to-Face Contact



Note. The graphs show predicted values of closeness for mean coping preference (middle, dotted lines), + 1 SD (high, dashed lines), and – 1 SD (low, solid lines), respectively. Stress: within-person component of stress (subject mean centered, original range: [1, 7], centered range: [-4.29, 5.03]). F2f: within-person component of face-to-face contact, dummy coded (0 = no face-to-face contact, 1 = face-to-face contact). Coping Preference: Preference to cope together as a couple (high values) rather than individually (low values; grand mean centered, original range: [1, 7], centered range: [-3.7, 2.3]).