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# Feeling the Absence of Touch: Distancing, Distress, Regulation, and Relationships in the Context of COVID-19

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## Abstract

During the COVID-19 pandemic, physical distancing guidelines were implemented to reduce viral spread, altering typical social interactions and reducing the amount of physical contact and affectionate touch many individuals experienced. The pandemic also caused psychological distress, perhaps in part related to reductions in affectionate touch with close others. We theorized that this would be particularly problematic for individuals reliant on affectionate touch to help regulate their emotions. Using online survey data collected nationwide from married or romantically partnered adults ($N$ = 585), we examined how physical distancing (moderated by cohabiting with spouse/partner) and affectionate touch with close others (moderated by individual differences in typical use and efficacy of touch for affect regulation [TAR]) related to individual psychological distress and romantic relationship quality. As hypothesized, more physical distancing was associated with less affectionate touch among non-cohabiters, but surprisingly with *more* touch among cohabiters. Also as hypothesized, participants higher in TAR and experiencing less affectionate touch reported more psychological distress than those similarly high in TAR and experiencing more affectionate touch, or than those lower in TAR. Unexpectedly, more physical distancing was associated directly with *lower* psychological distress and *better* relationship quality. Better relationship quality was linked directly to more affectionate touch and greater endorsement of TAR. Thus, for those cohabiting in satisfying romantic relationships, physical distancing may facilitate relationship-positive

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behaviors. Further, individual differences in TAR may influence the potency of touch effects on mood and stress.

**Keywords**
Physical affection, social touch, affect regulation, romantic relationships, social distancing, COVID-19

As a result of the COVID-19 pandemic, humanity has confronted fear of disease, grief and loss, and economic calamity, leading to high levels of distress (APA, 2020). A disruptive secondary stressor has been social distancing, which is critical to slowing viral spread (WHO, 2020). Social distancing requires individuals to remain six feet apart when possible and reduce or refrain from *social touch*, defined here as interindividual physical contact with the potential to regulate affect, influence affiliation, or convey information about social partners or relationships (see Gliga et al., 2019). Accordingly, social distancing has led to widespread structural changes in even the most minimal social interactions, which may detract from well-being (Gunaydin et al., 2021). As profoundly social primates with a phylogenetic legacy of social touch, humans thrive best within a social network (Baumeister & Leary, 1995; Dunbar, 2018) that includes close physical connection with others (Dunbar, 2010; Jablonski, 2021). Hence, some of our most reliable ways of coping—via in-person social connection and social support—have been deeply affected by the pandemic.

Social touch that is wanted and appropriate can regulate affective states, including emotions and stress responses, and enhance relationships. As reviewed below, social information conveyed through touch may influence affective states both directly via changes in sensory processing or by interoceptive contributions to subjective state (Burleson & Quigley, 2021; Morrison et al., 2010), and indirectly via interpretation, meaning, and context, as in the expression of affection in relationships (Jakubiak & Feeney, 2017). These influences make touch a resource for self- and co-regulation, which can enhance both individual well-being and relationship quality (Sbarra & Hazan, 2008). At the same time, there are individual differences in attitudes toward and experiences of social touch depending on life experiences and sociocultural background (e.g., Burleson et al., 2019) and likely on traits such as sensory sensitivity as well (Ward, 2019). Yet, relatively little attention has been paid to potential individual differences in the use of touch as an affect regulation strategy, which may be especially relevant during the pandemic given prescribed restrictions on touch.

Thus, on top of the pandemic and its ramifications causing widespread psychosocial stress, physical distancing may have paradoxically decreased the availability and potentially the potency of an important social resource for relieving that stress and strengthening relationships—physical contact with a wide spectrum of social partners. The current study used an online survey administered early in the pandemic to investigate associations among physical distancing, cohabitation, and affectionate touch frequency,

and their links to psychological distress and relationship quality among romantically partnered adults.

## Regulation by Social Touch

In proposing social baseline theory (SBT), Coan (2008) suggested that because of our need for extensive care during infancy and our evolutionary history of adaptation to group living, humans are phylogenetically prepared to "expect" (on a neural level) both social inputs and access to social resources to regulate our energy needs. Like all mammals, humans predictively manage energy intake and expenditure via an allostatic process: monitoring our internal and external environments and adjusting our upcoming behavior accordingly (Sterling, 2012). Human allostasis is first enabled by attachment to a caregiver in infancy, and remains a crucial social process throughout life, as social interactions influence our internal states and convey information about potential resources in the social world (Schulkin, 2011). In other words, our "baseline" state is social. A corollary of SBT is that the regulation of affective states by social proximity and social interaction is the *norm* (Coan, 2010). Thus, SBT further implies that when social proximity and interaction are absent or substantially reduced, as has happened during the pandemic, affect regulation will be compromised.

Social touch is an unmistakable signal of proximity to another person. Further, it can directly alter interoception (Craig, 2015), via a process we describe as social interoception (Burleson & Quigley, 2021). Thus, another important implication of SBT is that social touch can regulate affective states, including responses to stress. The "social touch hypothesis" further extends this idea with evidence that social touch operates interpersonally as a neuroanatomically differentiated and functionally distinct domain of touch (Morrison et al., 2010; Olausson et al., 2010), sharing neurocircuitry with stress-buffering and other affective processes (Morrison, 2016).

Given the above, it is not surprising that social touch can affect nearly every kind of in-person social interaction. Depending on social context and individuals' comfort with touch (Webb & Peck, 2015), behaviors such as handshakes, friendly hugs, or touches on the arm or shoulder can enhance prosocial affective states including interpersonal trust (da Rosa Pulga et al., 2019) and gratitude (Simão & Seibt, 2015). These regulatory effects ease social interactions with acquaintances and unfamiliar others and facilitate a wide range of relationships. Physical distancing, however, necessitates decreasing or eliminating these non-intimate social touch behaviors. This could cause day-to-day social interactions to be perceived as impoverished or inadequate, with potential repercussions for individual and relational well-being.

## Social Touch in Relationships

Because the allostatic value of another person is greatly enhanced by predictability and a history of mutual benefit, social touch from a close relationship partner should be a particularly effective regulator. Indeed, touch within close relationships *is* especially potent. As proposed in affection exchange theory (Floyd, 2006), affectionate touch can

activate widespread relational-cognitive and neurobiological changes that promote both well-being and relationship quality. For example, affectionate touch has been linked with improved mood, less distress, and/or lower perceived stress in multiple daily diary studies (e.g., Burleson et al., 2007; Debrot et al., 2014; Debrot et al., 2020; Murphy et al., 2018), after laboratory stressors (e.g., Jakubiak & Feeney, 2019a; Robinson et al., 2015), and after a 6-week intervention to increase kissing frequency in couples (Floyd et al., 2009). Affectionate touch interventions also can induce physiological changes that indicate more positive affective states or lower stress responses, including reduced threat-associated brain activation (Coan et al., 2006), lower salivary alpha-amylase (Holt-Lunstad et al., 2008), and lower cardiovascular reactivity to stressors (Ditzen et al., 2007). On the other hand, receiving less affectionate touch than desired is linked with individual and relational negative outcomes (e.g., loneliness, relationship dissatisfaction; Floyd, 2014).

Our closest primate relatives depend on social touch to maintain intense, sometimes lifelong relationships, on which they rely for support (Dunbar, 2018). Among humans, social touch is particularly consequential for relationships when it expresses affection, love, care, fondness, or appreciation (Floyd, 2006). Affectionate touch is a way of enacting intimacy, which is crucial for relationship quality (Jolink et al., 2021; Reis & Shaver, 1988). Many findings spanning cross-sectional, longitudinal, and experimental studies show consistent associations between higher levels of physical affection and positive evaluations of romantic relationships (Jakubiak & Feeney, 2017; see also Carmichael et al., 2021; Fisher et al., 2015; Van Raalte et al., 2021; Wagner et al., 2020). As summarized in Jakubiak and Feeney's review and theoretical model (2017), when touch is interpreted as affectionate, it has relationship-enhancing effects. These include stronger feelings of inclusion, felt security, closeness, intimacy, and partner appreciation (Ben-Ari & Lavee, 2007; Debrot et al., 2013; Jakubiak & Feeney, 2016, 2019b).

## *Individual Differences in Regulation by Social Touch*

Insofar as social or affectionate touch can benefit well-being and relationship quality, more touch may help offset distress and relationship problems. Similar to variation in use of typical emotion regulation strategies (e.g., Grommisch et al., 2020), individuals' ideal levels of touch differ (Jakubiak et al., 2021; Trotter et al., 2018), as does the strength of the association between touch and measures of well-being. Accordingly, the regulatory benefits may be most apparent for those who more strongly endorse using touch for affect regulation (TAR), an attribute that is particularly relevant in light of social distancing. We conceptualized TAR as the extent to which individuals make efforts to self- or co-regulate with touch in their daily lives (e.g., seeking a hug to improve mood or reduce distress), as well as the efficacy of these efforts. Although research supports the proposition that social touch can alter affective states, less is known regarding how TAR itself may relate to other characteristics. For example, individuals for whom social touch is a desirable and effective emotion regulation strategy might be more socially oriented and regulated in general, and therefore might report better relationship quality. Those higher in TAR also presumably would benefit more from available affectionate touch and suffer a greater regulatory cost if it were reduced than those lower in TAR. Thus, in the current study we

investigated the nature of the associations among TAR, individual distress, and relationship quality during the pandemic's early stages.

## Current Study

Our aim was to explore social (physical) distancing and social touch during the pandemic and their associations with psychological distress and romantic relationships. We tested a moderated mediation model, illustrated in Figure 1 and described below. Following the framework outlined in (Tate, 2015) for imposing conceptual time-ordering on cross-sectional data, we reasoned that because then-newly-mandated physical distancing interfered with normal social interactions and activities, it could cause psychological distress or put extra pressure on romantic relationships. We therefore hypothesized that more physical distancing would be directly associated with (H1) more psychological distress, and (H2) worse relationship quality.

We also reasoned that unless participants were particularly averse to touch prior to the pandemic, adherence to physical distancing guidelines would result in a reduction in their affectionate touch with persons outside their household or quarantine group. For those cohabiting with romantic partners, though, at least one likely source of affectionate touch remained available. Accordingly, we hypothesized that (H3c, where "c" denotes a conditional path) for those not cohabiting with spouses or romantic partners, more physical distancing would be directly associated with less frequent affectionate touch; and that this association would be reduced or absent for cohabiters.

Based on the theoretical background and research reviewed above suggesting that affectionate touch can regulate affective states and strengthen social bonds, we hypothesized that (H4c) more affectionate touch would be directly associated with lower psychological distress, and that the association would be stronger for those who endorsed

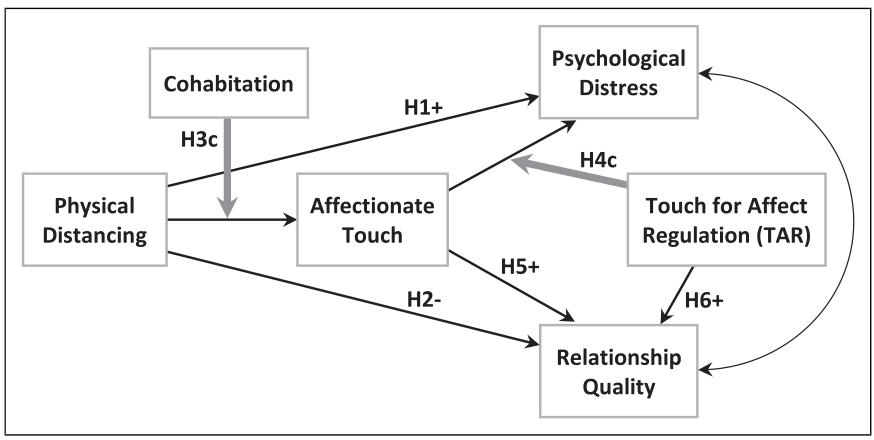


**Figure 1.** Conceptual model.

higher TAR ratings. We also hypothesized that (H5) more affectionate touch and (H6) higher TAR ratings each would be directly associated with better relationship quality.

Finally, we hypothesized that (indH7c) more physical distancing would be indirectly associated with greater psychological distress via less affectionate touch, most strongly for non-cohabiting participants who endorsed greater TAR, and that (indH8c) more physical distancing would be indirectly associated with worse relationship quality via less affectionate touch, particularly for those not cohabiting.

## Method

### Participants

Between April 24 and April 27, 2020, a sample of 1017 English-speaking adults was recruited in the United States (US) through Prolific, an online data collection service. Age, gender, and ethnicity were distributed proportionately to the US population in 2015, per Prolific procedure. Ten participants who missed more than one attention check were excluded, leaving a final sample of 1007. Of the 594 reporting a romantic relationship, we included only those who reported age, gender, and cohabitation status with romantic partners[1], $N = 585$. Of these, 473 were cohabiting; 340 of those were married. Of the 112 non-cohabiters, 8 were married.

Of the 294 reporting female gender (50.3% of subsample), 82.3% identified as heterosexual, 2.4% as lesbian, 12.6% as bisexual, 1.7% as queer, and 0.7% as other. Of the 291 reporting male gender, 94.2% identified as heterosexual, 3.1% as gay, 2.4% as bisexual, and 0.3% as queer. No participant reported non-binary or other gender. The average participant was mid-aged ($M = 45.4$ yrs, $SD = 15.3$, median = 45, range = 18–79) and White (74.5% White, 10.8% Black or African American, 6.0% Latinx or Hispanic, 6.8% Asian, 0.7% American Indian or Alaskan Native, 0.2% Native Hawaiian or Pacific Islander, and 0.9% Other); 89% had at least some college, 6% were students, 55.7% were employed, and 51.8% reported annual household income above $60,000. On average, participants reported 2.8 people living in their households, including themselves ($SD = 1.3$). When surveyed, 99.1% were under stay-at-home orders; 92.8% for 3 weeks or more.

### Procedure

After giving informed consent per APA guidelines, participants completed an IRB-approved 20-minute online survey comprising the measures below and others reported elsewhere, received links to health- and COVID-19-specific resources, and were compensated $2.85.

### Measures

*Demographics.* Demographics included gender, age, race/ethnicity, education, employment status, income, relationship status, and household composition. Age was recoded into six categories: 18–24, 25–34, 35–44, 45–54, 55–64, and 65 and older.

*Cohabitation* was coded 1 if participants lived with their romantic partners and 0 otherwise.

*Physical Distancing.* Using a five-point scale from 1 (*Not at all*) to 5 (*Very often*), participants indicated how often each day they carried out the following behaviors, which were based on public health guidelines available in April 2020: keep a safe distance from others, stay home as much as possible, and avoid crowds and social gatherings. Higher means reflected more *physical distancing* (Cronbach's α: non-cohabiters = .79, cohabiters = .83).

*Affectionate Touch.* Affectionate touch over the past 2 weeks was measured with four items taken from (Light et al., 2005) and further adapted in our laboratory. Using a 5-point scale of 1 (*Never*) to 5 *(Daily or almost daily*), participants rated the frequency of these behaviors "with the person(s) to whom you are closest": affectionate hugging, affectionate touching or patting anywhere on the body, affectionate kissing, and affectionate cuddling. Scores were averaged (*affectionate touch*); higher scores reflected more frequent affectionate touch (Cronbach's α: non-cohabiters = .94, cohabiters = .94).

*Psychological Distress.* Psychological distress over the past 2 weeks was measured using the 12-item General Health Questionnaire (Goldberg & Williams, 1988). Six negative items (e.g., felt constantly under strain) were answered on a 4-point scale from 0 (*Not at all*) to 3 (*Much more than usual*). Six positive items (e.g., felt capable of making decisions about things) used a 4-point scale from 0 (*Much less than usual*) to 3 (*More than usual*), and were reverse-scored. Higher 12-item averages reflected greater *psychological distress* (Cronbach's α: non-cohabiters = .90, cohabiters = .89).

*Relationship Quality.* Romantic relationship quality over the past 2 weeks was assessed with one item representing each of the six subscales from the Perceived Relationship Quality Components scale (Fletcher et al., 2000). Sample items: "How satisfied are you in your relationship?" and "How much can you count on your partner?" Responses used a 5-item scale from 1 (*Not at all*) to 5 (*Extremely*). Higher means indicated higher ratings of *relationship quality* (Cronbach's α: non-cohabiters = .84, cohabiters = .86).

*Touch for Affect Regulation.* TAR was measured with four original items generated in our laboratory to assess how much, in daily life, participants used touch to regulate their subjective affective states, and the extent of its effectiveness. Participants rated each statement using a 6-point scale from 1 (*Strongly disagree*) to 6 (*Strongly agree*). Items were "I seek a hug when I want to improve my mood," "When I am feeling something I don't want to feel, touch helps me think about other things," "Touch helps me control my emotions by not expressing them," and "After getting a hug, I feel more prepared to handle stress." Exploratory factor analysis using maximum likelihood estimation revealed one underlying factor, which we called *touch for affect regulation (TAR)*. Higher means represented greater TAR (Cronbach's α: non-cohabiters = .81, cohabiters = .81).

*COVID-19 Worry.* Worry about COVID-19 was assessed using a 7-item scale. Five items were taken from the Perceived Coronavirus Threat Questionnaire (Conway et al., 2020). Sample item: "Thinking about the coronavirus (COVID-19) makes me feel threatened." Responses used a 7-point scale from 1 (*Not true of me at all*) to 7 (*Very true of me*). Two original items were added: "How worried are you about catching coronavirus?"

and "How likely do you believe you are to get coronavirus (COVID-19)?" Responses for these items ranged from 1 (*Not at all*) to 7 (*Very*). Higher means reflected higher *COVID-19 worry* (Cronbach's α: non-cohabiters = .92, cohabiters = .91).

*Positive Touch Attitude.* Attitude about interpersonal touch was assessed using three items from the Social Touch Questionnaire (Wilhelm et al., 2001): "I like when people express their affection for me in a physical way," "I generally seek physical contact with others," and "I feel comfortable touching people I do not know very well." Responses used a five-point scale from 1 (*Not at all*) to 5 (*Extremely*). Higher means represented a more positive *touch attitude* (Cronbach's α: non-cohabiters = .78, cohabiters = .79).

### Model Specification and Data Analyses

To test our overall conceptual model (Figure 1), we specified a moderated mediation model using observed variables, with physical distancing as initial exogenous predictor, affectionate touch as mediator, cohabitation as moderator of the path from physical distancing to affectionate touch, paths from affectionate touch to psychological distress and relationship quality, and with TAR as moderator of the path from affectionate touch to psychological distress, and as exogenous predictor of relationship quality. Because we anticipated that both general comfort with social touch and concerns about COVID-19 would form a backdrop for the associations among variables, we included positive touch attitude and COVID-19 worry as covariates, along with age and gender.

We estimated the model using maximum likelihood under Mplus v.8.3 (Muthén and Muthén, 1998). After exclusion for missing demographics, no remaining data were missing. Predictors were mean-centered before calculating conditional effects. Hypothesized conditional direct and conditional indirect effects were probed using the PROCESS macro v.3.4 (Hayes, 2018) under SPSS v.26, and illustrated at ±1 *SD* from the mean. For model fit, we report model chi-square (df) and significance level, comparative fit index (CFI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR), along with variance accounted for ($R^2$) in each dependent variable. For direct and conditional direct paths, we report standardized path coefficients, unstandardized path coefficients and standard errors, *p*-values, and 95% confidence intervals. For indirect paths, we report standardized path coefficients, unstandardized path coefficients, bootstrapped standard errors and 95% confidence intervals, and indices of moderated mediation or conditional moderated mediation (Hayes, 2015).

## Results

### Preliminary Analyses

Table 1 illustrates bivariate correlations, by cohabitation with romantic partner, for all variables. Among cohabiters, more affectionate touch was related to younger age, more physical distancing, better relationship quality, higher TAR, and more positive touch attitude. Among non-cohabiters, more affectionate touch was related to less physical

**Table 1.** Pearson Correlations Among Study Variables, by Cohabitation Status.

| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Gender[a] | – | .09 | .03 | -.05 | .10 | .02 | -.05 | .15 | -.04 |
| 2 | Age category[b] | -.05 | – | -.12 | -.01 | .08 | -.15 | **-.02** | -.40*** | -.16 |
| 3 | COVID-19 worry | .18*** | -.09* | – | .09 | .42*** | .19* | **-.22*** | .46*** | -.09 |
| 4 | Positive touch attitude | .01 | -.10* | .12** | – | .10 | .58*** | **-.07** | -.07 | .03 |
| 5 | Physical distancing | .06 | .03 | .46*** | .03 | – | .18 | **-.30**** | -.02 | .10 |
| 6 | Touch affect regulation | .10* | -.07 | .23*** | .62*** | .14** | – | **-.05** | .21* | .17 |
| 7 | Affectionate touch behavior[c] | .04 | **-.26***** | **.04** | **.21***** | **.09*** | **.29***** | – | -.09 | **.14** |
| 8 | Psychological distress[c] | .15** | -.28*** | .37*** | .04 | .06 | .07 | .03 | – | -.07 |
| 9 | Relationship quality[c] | -.05 | -.08 | .05 | .16*** | .16*** | .28*** | **.45***** | -.21*** | – |

*Note.* Upper triangle = not cohabiting, $n$ = 112. Lower triangle = cohabiting, $n$ = 473. Corresponding $r$-values in bold font differ between cohabitation groups at $p<.05$.
*$p<.05$. **$p<.01$. ***$p<.001$.
[a]Coded 0 = male, 1 = female.
[b]Age categories (yrs): 1 = 18–24, 2 = 25–34, 3 = 35–44, 4 = 45–54, 5 = 55–64, 6 = 65 and older.
[c]Variables assessed "over the past 2 weeks".

distancing and less COVID-19 worry. No other correlations differed significantly between groups.

Table 2 illustrates means and standard deviations, along with $F$ values, significance levels, and effect sizes for the differences between groups. Cohabiting participants were older and reported more affectionate touch, less psychological distress, and better relationship quality over the past 2 weeks than non-cohabiters.

## Model Tests

Full unstandardized results for the model, including covariates[2,3], are displayed in Tables 3 and 4; standardized path coefficients ($\beta$) are given in text and Figures 2, 3, and 4. Model fit to the data was good, $\chi 2\ (7) = 16.911$, $p = .018$, CFI = 0.978, RMSEA = .049 [90% CI = 0.019, 0.080], SRMR = .025.

## Unconditional Direct Associations

We predicted that more physical distancing would be associated with both (H1) greater psychological distress and (H2) worse relationship quality. Instead, more physical distancing was associated with *lower* psychological distress ($\beta = -0.148$, $p<.001$) and *better* relationship quality ($\beta = 0.155$, $p<.001$). On the other hand, consistent with H5 and H6, respectively, both more affectionate touch ($\beta = 0.371$, $p<.001$) and higher TAR ($\beta = 0.210$, $p<.001$) were associated with better relationship quality.

**Table 2.** Means and Standard Deviations of Study Variables by Cohabitation Status.

| | Not cohabiting | | Cohabiting | | | | |
|---|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | $F$ (1,583) | $p_{diff}$ | $\eta_p^2$ |
| Gender[a] | 0.44 | 0.50 | 0.52 | 0.50 | 2.35 | .126 | .004 |
| Age category[b] | 2.76 | 1.56 | 3.76 | 1.45 | **41.87** | **<.001** | **.067** |
| COVID-19 worry | 4.08 | 1.58 | 4.34 | 1.48 | 2.88 | .090 | .005 |
| Positive touch attitude | 2.74 | 0.98 | 2.61 | 0.95 | 1.76 | .185 | .003 |
| Physical distancing | 4.64 | 0.60 | 4.67 | 0.59 | 0.28 | .597 | .000 |
| Touch affect regulation | 3.45 | 1.23 | 3.51 | 1.17 | 0.24 | .623 | .000 |
| Affectionate touch behavior[c] | 2.19 | 1.35 | 3.65 | 1.37 | **103.49** | **<.001** | **.151** |
| Psychological distress[c] | 1.29 | 0.68 | 1.15 | 0.57 | **5.10** | **.024** | **.009** |
| Relationship quality[c] | 3.67 | 0.96 | 4.01 | 0.83 | **14.09** | **<.001** | **.024** |

*Note.* Not cohabiting $n$ = 112. Cohabiting $n$ = 473. $\eta_p^2$ = partial eta squared.
[a]Coded 0 = male, 1 = female.
[b]Age categories (yrs): 1 = 18–24, 2 = 25–34, 3 = 35–44, 4 = 45–54, 5 = 55–64, 6 = 65 and older.
[c]Variables assessed "over the past 2 weeks".

In the context of the full model, residuals for psychological distress and relationship quality were negatively correlated (r = −0.217, $p$<.001).

Conditional Direct Associations

Consistent with H3c, the association between physical distancing and affectionate touch depended on whether participants were cohabiting ($\beta$ = 0.141, $p$ = .002; Figure 3). For non-cohabiters, more physical distancing was associated with less affectionate touch ($\beta$ = −0.239, $p$ = .017), whereas for cohabiters, more physical distancing was associated with *more* affectionate touch ($\beta$ = 0.117, $p$ = .010).

Consistent with H4c, the association between more affectionate touch and lower psychological distress was stronger among participants endorsing higher TAR ($\beta$ = −0.075, $p$ = .038). We tested conditional direct associations at ±1 *SD* from the mean of TAR (Figure 4). For participants endorsing high TAR, more affectionate touch behavior was associated with lower psychological distress ($\beta$ = −0.141, $p$ = .014); for those endorsing average or low TAR, the association was not significant ($\beta$ = −0.069, $p$ = .082; $\beta$ = −0.002, $p$ = .965, respectively).

## *Indirect Associations*

For indH7c, we hypothesized that more physical distancing would be indirectly associated with more psychological distress via less affectionate touch (especially for non-cohabiters and those with high TAR ratings). Results supported this prediction, but only among non-cohabiters reporting high TAR ($\beta$ = .034, $p$<.05; see Table 4).

For indH8c, we hypothesized that more physical distancing would be indirectly associated with worse relationship quality via less affectionate touch (especially for non-cohabiters). This prediction was supported for non-cohabiters ($\beta$ = −0.088, $p$<.05). Again

**Table 3.** Unstandardized Coefficients, Standard Errors, Significance Levels, and 95% Confidence Intervals for Direct and Conditional Direct Effects.

| | | Consequent variables | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Affectionate touch[a] | | | | | Psychological distress[a] | | | | | Relationship quality[a] | | | |
| Antecedent variables | Hyp[b] | *Coeff* | *SE* | *p* | CI [LL,UL] | Hyp[b] | *Coeff* | *SE* | *p* | CI [LL,UL] | Hyp[b] | *Coeff* | *SE* | *p* | CI [LL,UL] |
| Physical distancing | H3c | .123 | .106 | .249 | -.086, .331 | H1 | **-.148** | **.035** | **<.001** | **-.217, -.080** | H2 | **.226** | **.063** | **<.001** | **.103, .349** |
| Cohabitation | H3c | **1.704** | **.142** | **<.001** | **1.425, 1.983** | | – | – | – | – | | – | – | – | – |
| Distancing × cohabitation | H3c | **.894** | **.269** | **.001** | **.367, 1.420** | | – | – | – | – | | – | – | – | – |
| Not cohabiting | H3c | **-.601** | **.251** | **.017** | **−1.094,-.109** | | – | – | – | – | | – | – | – | – |
| Cohabiting | H3c | **.295** | **.114** | **.010** | **.071, .518** | | – | – | – | – | | – | – | – | – |
| Affectionate touch | | – | – | – | – | H4c | -.028 | .016 | .082 | -.059, .003 | H5 | **.215** | **.025** | **<.001** | **.166, .265** |
| Touch affect regulation (TAR) | | – | – | – | – | H4c | .029 | .023 | .198 | -.015, .073 | H6 | **.153** | **.037** | **<.001** | **.080, .225** |
| Affectionate touch × TAR | | – | – | – | – | H4c | **-.025** | **.012** | **.038** | **-.048, -.001** | | – | – | – | – |
| Low TAR (*M* − *SD*) | | – | – | – | – | H4c | .001 | .020 | .965 | -.038, .040 | | – | – | – | – |
| Average TAR (*M*) | | – | – | – | – | H4c | -.028 | .016 | .082 | -.059, .004 | | – | – | – | – |
| High TAR (*M* + *SD*) | | – | – | – | – | H4c | **-.056** | **.023** | **.014** | **-.101, -.011** | | – | – | – | – |

*(continued)*

**Table 3.** (continued)

| | | Consequent variables | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Affectionate touch[a] | | | | | Psychological distress[a] | | | | | Relationship quality[a] | | | |
| Antecedent variables | Hyp[b] | *Coeff* | *SE* | *p* | CI [LL,UL] | Hyp[b] | *Coeff* | *SE* | *p* | CI [LL,UL] | Hyp[b] | *Coeff* | *SE* | *p* | CI [LL,UL] |
| Intercept | | .361 | .273 | .186 | -.174, .896 | | **.971** | **.119** | **<.001** | **.737,1.206** | | **4.367** | **.176** | **<.001** | **4.023,4.711** |
| Gender[c] | | .087 | .108 | .419 | -.124, .299 | | **.107** | **.043** | **<.001** | .022, .191 | | -.119 | .064 | .063 | -.244, .006 |
| Age category[d] | | **-.190** | **.035** | **<.001** | **-.259, -.121** | | **-.111** | **.015** | **<.001** | **-.140, -.083** | | -.013 | .020 | .503 | -.052, .026 |
| COVID-19 worry | | -.072 | .040 | .075 | -.150, .007 | | **.161** | **.016** | **<.001** | **.129, .193** | | .047 | .024 | .048 | -.093, .000 |
| Touch attitude | | **.218** | **.059** | **<.001** | **.103, .333** | | -.051 | .029 | .083 | -.108, .007 | | -.044 | .041 | .278 | -.124, .036 |
| | | **$R^2$ = .230, $p$<.001** | | | | | **$R^2$ = .265, $p$<.001** | | | | | **$R^2$ = .208, $p$<.001** | | | |

*Note*. For effects in bold font, $p$<.05. Variables centered at zero before computing interaction terms.
[a]Variables assessed "over the past 2 weeks".
[b]Hyp = Hypothesis corresponding to results displayed to the right on that row; "c" in hypothesis designator indicates moderation.
[c]Coded 0 = male, 1 = female.
[d]Age categories (yrs): 1 = 18–24, 2 = 25–34, 3 = 35–44, 4 = 45–54, 5 = 55–64, 6 = 65 and older.

**Table 4.** Unstandardized Coefficients, Bootstrap Standard Errors, and Bootstrap 95% Confidence Intervals for Indirect Paths.

| Moderator W[a] | Moderator Z[a] | *Coeff* | Boot *SE* | Boot CI [LL, UL] |
|---|---|---|---|---|
| **IndH7c:** Physical distancing → affectionate touch behavior[b] → psychological distress[b] | | | | |
| Not cohabiting | Low TAR | $-.001_{abc}$ | .014 | -.030, .028 |
| Not cohabiting | Average TAR | $.017_{ac}$ | .013 | -.003, .048 |
| Not cohabiting | High TAR | $\mathbf{.034_{a}}$ | **.022** | **.003, .086** |
| Cohabiting | Low TAR | $.000_{abc}$ | .006 | -.012, .015 |
| Cohabiting | Average TAR | $-.008_{bc}$ | .006 | -.021, .002 |
| Cohabiting | High TAR | $\mathbf{-.017_{b}}$ | **.010** | **-.038, -.001** |
| Indices conditional moderated mediation by W | | | | |
| | Low TAR | .001 | .020 | -.038, .043 |
| | Average TAR | -.025 | .017 | -.064, .004 |
| | High TAR | **-.050** | **.027** | **-.113, -.007** |
| **IndH8c:** Physical distancing → affectionate touch behavior[b] → relationship quality[b] | | | | |
| Not cohabiting | | $\mathbf{-.129_{a}}$ | **.059** | **-.264, -.037** |
| Cohabiting | | $\mathbf{.063_{b}}$ | **.026** | **.013, .116** |
| Index moderated mediation | | **.193** | **.065** | **.087, .336** |

*Note.* Coeff = path coefficient. TAR = touch for affect regulation. Effects in bold font are different from zero at $p<.05$. Coefficients with different subscripts are different from each other at $p<.05$.
[a]Moderator = level of moderator for each conditional path. W = cohabitation, Z = TAR.
[b]Variables assessed "over the past 2 weeks".

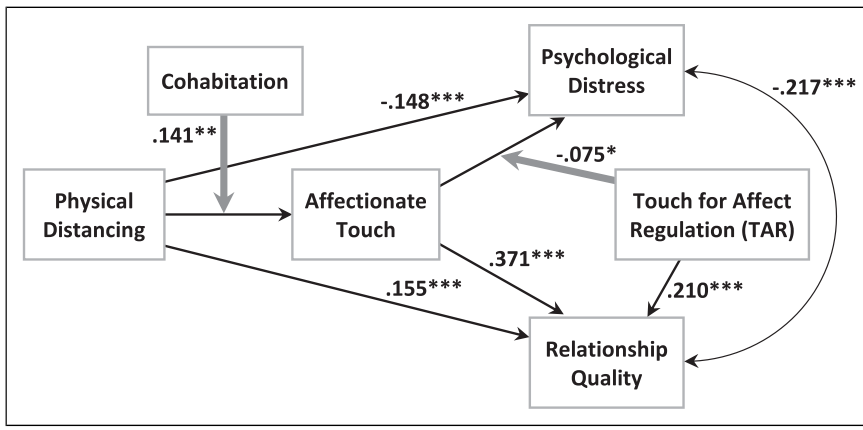


**Figure 2.** Standardized model coefficients. *$p<.05$. **$p<.01$. ***$p<.001$.

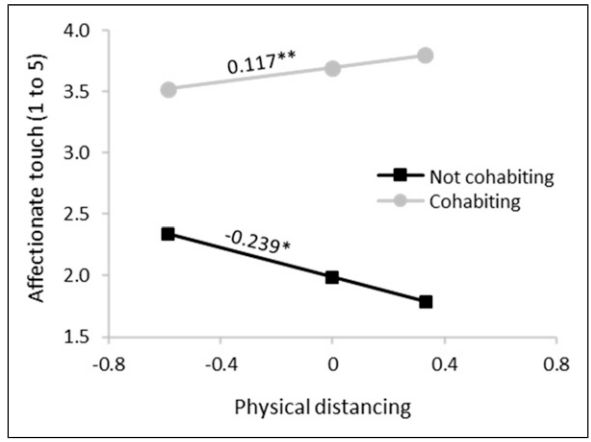


**Figure 3.** Conditional effects of physical distancing on affectionate touch as a function of cohabitation.

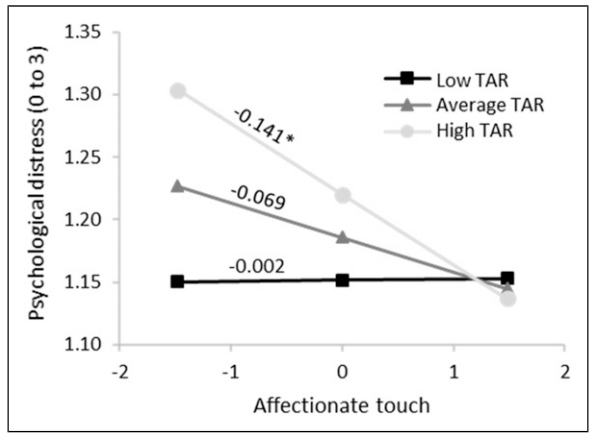


**Figure 4.** Conditional effects of affectionate touch on psychological distress as a function of Touch for After Regulation (TAR).

unexpectedly, more physical distancing was associated with *better* relationship quality via *more* affectionate touch ($\beta$ = .043, $p$<.05) among cohabiting participants.

## Discussion

The COVID-19 pandemic fundamentally altered how people engaged with one another, because physical distancing was required to contain viral spread. In doing so, it provided a

"natural manipulation" with which to investigate associations with social touch, as most social touch outside one's home was substantially reduced. Anecdotal reports early in the pandemic, and subsequent corroboration, point to the challenges of physical distancing for well-being and relationships (e.g., Gonçalves et al., 2020). This is consistent with decades of work revealing that regular, close contact with others is intimately tied with mental and relationship health (e.g., Hammig, 2019). Based on reasoning supported by this work, as well as theories underscoring the centrality of social touch to regulation, well-being, and relationships (e.g., Coan, 2008; Floyd, 2006; Morrison, 2016; Reis & Shaver, 1988), we developed a conceptual model to capture interrelationships among physical distancing, affectionate touch, psychological distress, and romantic relationship quality early in the pandemic (see Figure 1). Although we cannot infer causality from these data, we consider our findings from the perspective of our model and also within a framework that assumes reciprocal (bidirectional and multidirectional) relationships.

## *Cohabitation Moderated the Association between Physical Distancing and Affectionate Touch*

In line with our hypothesis, results supported the proposed link between more physical distancing and less affectionate touch, but only among those who were not living with their partners. For those who were cohabiting, however, the association was neither less negative nor absent—instead, it was *positive*. In other words, the implications of physical distancing for affectionate touch depended strongly on the relationship context.

We suggest that for cohabiting romantic partners, the broad reduction in overall social and physical contact associated with physical distancing might have activated a compensatory effect, perhaps akin to that described by Maner and colleagues (Maner et al., 2007) in a social exclusion context, which led to more physical affection and other affiliative behaviors with those who were present. Alternatively, "isolating together" may have provided opportunities to devote more time and attention to each other, thereby encouraging relationship-positive behaviors such as physical affection (Evans et al., 2020), particularly for those in satisfying relationships (Hudson et al., 2020).

## *TAR Moderated the Association between Affectionate Touch and Psychological Distress*

Given theory and research suggesting that affectionate touch can regulate affect and enhance psychological well-being, we hypothesized that more affectionate touch would be directly associated with lower psychological distress. We also recognized, however, that individual differences in the tendency to regulate affective states via touch (TAR, discussed below) could influence the magnitude of this association. Consistent with those expectations, more frequent affectionate touch was linked with lower psychological distress among participants reporting higher typical levels of TAR, whereas those reporting lower TAR showed no such association. In other words, those who most used touch to regulate affect fared significantly worse without it, whereas this psychological cost was not incurred for those less reliant on touch. These findings underscore the

importance of assessing individual differences in touch-related attitudes and experiences when investigating outcomes associated with social touch. The lack of association between affectionate touch and psychological distress at lower levels of TAR was unexpected, especially in light of theory (Coan, 2008; Floyd, 2006) and previous findings supporting links between affectionate touch and lower levels of distress, milder stress responses, or less negative affective states (e.g., Debrot et al., 2020; Jakubiak & Feeney, 2019a; Robinson et al., 2015). It is possible that in the pandemic context, other concerns overrode effects of affectionate touch on psychological distress among low-TAR participants. Further research is clearly needed to ascertain the boundary conditions for affect regulation by touch.

### *Affectionate Touch Linked Directly with Relationship Quality*

As proposed, more affectionate touch was directly linked with better relationship quality. These results are consistent with the interpersonal process model of intimacy outlined by Reis and Shaver (1988) and with affection exchange theory (Floyd, 2006). The underlying processes are likely to be bi- or multidirectional, in that couples with satisfying relationships are more likely to exchange affectionate touch and vice-versa (e.g., Wagner et al., 2020). These findings add to previous evidence regarding the ability of touch to enhance relationship satisfaction, even amidst a devastating pandemic with potential repercussions in all aspects of life.

### *Physical Distancing Linked Directly with Psychological Distress and Relationship Quality*

Contrary to our hypotheses, increased physical distancing was directly associated with both *less* psychological distress and *better* relationship quality, even after controlling for affectionate touch, positive touch attitudes, and worry about COVID-19. Thus, if there were any direct ill effects of physical distancing on psychological distress or relationship quality, they were outweighed by unmeasured positive associations. For example, we speculate that fewer activities, distractions, and daily hassles (e.g., fewer social events, no commute if working from home) may have provided breaks, increasing time spent with loved ones at home and enhancing opportunities for meaningful interactions (e.g., Evans et al., 2020). Successful physical distancing may also have been associated with lower distress because it fostered a greater sense of self-efficacy and personal control, or reflected and reinforced a greater emphasis on social responsibility. Any of these factors may have offset potential adverse psychological consequences of distancing, at least in the initial weeks of the pandemic.

On the other hand, we cannot rule out that low psychological distress or a satisfying relationship may have promoted effective compliance with guidelines that might otherwise have been more difficult to implement. For example, a fulfilling relationship, especially if cohabiting, may have promoted better adherence to physical distancing because there was less need for contact with others during stay-at-home periods. Our findings suggest that for those fortunate to be living with a romantic partner during the

COVID-19 pandemic, physical distancing could be practiced without serious negative repercussions; it may even have yielded some psychological and relationship benefits alongside gains to public health.

## *Regulating Affective State via Touch*

Humans both actively and implicitly regulate affective states much of the time, such as by seeking out certain situations, hiding their feelings, or thinking differently about the circumstances (Gross, 1998, 2015). Touch may be an important part of this regulatory repertoire, either on its own or to supplement other strategies, and it may be used to a greater or lesser degree, as is the case with other regulation strategies (Grommisch et al., 2020; Gross & John, 2003). For example, it is widely accepted that physical touch is a primary means through which caregivers regulate (or "co-regulate") an infant's state, such as holding or stroking to calm and soothe the infant (Keller et al., 2004). This phenomenon has received relatively less explicit attention in adult relationships, but as reviewed earlier, touch from a loved one in particular can influence affective states and have regulating effects.

We operationalized TAR as the extent to which participants reported mood-enhancing or stress-reducing effects of social touch and how much they typically sought it for that purpose. The brief assessment used in this study was internally consistent in our sample, and as expected, higher ratings on this measure were associated with greater frequency of affectionate touch with close others and a more positive attitude toward social touch. As we hypothesized, greater endorsement of TAR also was directly associated with better relationship quality, even after controlling for all other predictors and covariates. We suspect that individuals who are more socially oriented in general (e.g., prioritizing, cultivating, and/or deriving more benefit from social relationships) are more likely to both have better romantic relationships and to report higher TAR. It may also be the case that individuals who are in satisfying relationships are more likely to derive regulatory benefits from the affectionate touch they receive, or that TAR encourages positive relationship interactions. Future studies of romantic relationships should examine TAR in both partners, to explore potential implications of a match or mismatch of TAR endorsement.

We also anticipated that individuals who relied more heavily on TAR would be especially likely to benefit from affectionate touch during the pandemic. Consistent with this, and as described above, more frequent affectionate touch was related to lower psychological distress among participants who endorsed higher typical levels of TAR. As noted, a substantial literature points to the benefits of affectionate touch for health and relationships, with newer models considering how touch can shape our experience more directly through social-sensory-interoceptive integration (e.g., Burleson & Quigley, 2021; Craig, 2015; Morrison, 2016). Our findings are important in revealing that against this backdrop of overall beneficial effects, affectionate touch may yield an added boost for those who rely on it to help them "feel better" through affect regulation. Reciprocally, those for whom affectionate touch is effective in regulating their affective states may come to rely on it more for that purpose.

Nevertheless, despite benefits of affectionate touch, being high in TAR may be a vulnerability in some circumstances, because it involves greater reliance on others to facilitate affect regulation. In our study, those who were higher in TAR but experiencing less affectionate touch reported the greatest psychological distress. Although pandemics requiring extreme social distancing fortunately are not frequent, there are other circumstances that require lengthy separations, such as work-related travel, military deployments, or major relocations (e.g., immigration before one's partner). Lack of touch in those situations may be more distressing for individuals who rely on touch as a significant part of their emotion regulatory repertoire. Following people over time during the pandemic, or during long separations, could reveal novel emotion- and self-regulation strategies that may co-occur with TAR or help in its absence.

### *Limitations*

Perhaps the most notable limitation of this study is that the data are cross-sectional self-reports. Although our hypotheses were derived using causal reasoning, causality cannot be inferred from data of this nature. Furthermore, as suggested above, many of the associations we found are most likely bi- or multidirectional. Longitudinal studies are needed to determine the temporal order of these associations, whether and how links among social distancing, affectionate touch, psychological distress, and relationship quality may change over the course of the pandemic, and how differences and alterations in household structure and family dynamics influence these links.

In addition, even though survey recruitment was nationwide, its generalizability is limited insofar as it reflects those with Internet access, registered with Prolific, and inclined to participate in a survey early in a pandemic. From within the full sample, we included only romantically partnered participants; most were married, heterosexual, and non-Hispanic White, further limiting generalizability. Overall, participants reported relatively high relationship satisfaction and relatively low psychological distress. Therefore, they may have had sufficient social support going into the pandemic to minimize potential adverse effects of social distancing. Had those with more problematic relationships or more distressing life circumstances participated, results might have revealed a more negative influence. Conceptual replication in the context of national emergencies or unwanted separations may shed further light on this question.

Finally, the data were derived from a large collaborative online survey that was implemented as rapidly as possible to capture the early social responses to COVID-19. We did not assess disability status, nor did we include sufficient gender-related information to determine whether participants were transgender. Potential group differences in touch attitudes, effects, and experiences that are based on these identifiers, as well as others such as race, ethnicity, and sexual orientation, may be fruitful areas for further research. Additionally, the newness of the pandemic and overall length of the survey required us to shorten pre-existing scales and create new ones. Our assessment of TAR was limited, comprising only four items. These items were newly developed in our laboratory and had not yet been subjected to rigorous psychometric evaluation. Furthermore, we expect that TAR and its potential effects are likely to be influenced by social and relationship context

(Burleson et al., 2019), individual differences in touch attitudes (Webb & Peck, 2015; Wilhelm et al., 2001), and other regulatory processes (Gross & John, 2003); future research can investigate these possibilities. More thorough assessments of touch attitudes and affectionate touch frequency, including diary or observational studies, also are warranted. Due to an inadvertent omission from the survey, our measure of affectionate touch frequency did not specify the identity of the "touch partner." Given the difference between cohabiters and non-cohabiters in affectionate touch frequency, we suspect the findings would be similar with affectionate touch limited to romantic partners, but this remains an empirical question. Future research regarding the source, frequency, and potential cumulative effects of physical affection will be informative.

## Conclusion

Although anecdotal reports and mounting evidence support social distancing-related difficulties (e.g., Evans et al., 2020; Gruber et al., 2020) in our sample of romantically partnered individuals studied early in the pandemic, physical distancing adherence was associated directly with lower psychological distress, more frequent physical affection for those living with their romantic partners, and better relationship quality. In other words, in addition to promoting public health, it is possible that physical distancing may have had psychological and interpersonal benefits for those fortunate to be living with a romantic partner early in the pandemic. If that is the case, we suspect that affectionate touch contributed to these effects; other potential pathways remain to be discovered.

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1. The research reported in the manuscript was not pre-registered.
2. The data used in the research are not available on an online platform at this time.
3. The data used in the research are available by writing to the corresponding author burleson@asu.edu
4. The materials used in the research are not available on an online platform at this time.
5. The materials used in the research are available by writing to the corresponding author.

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## Notes

1. For brevity, we refer to both spouses and partners in romantic relationships as "romantic partners."
2. Most of our measures were developed or adapted for the present study. Given the importance of rapid implementation (see Limitations), validity data are not available. Preliminary data regarding the affectionate touch measures (affectionate touch frequency and TAR) are available upon request from the corresponding author.
3. Per a reviewer's suggestion, we tested number of children in the home as an additional covariate. Both the estimates and their significance levels were remarkably similar to the originals; number of co-resident children was not a significant predictor of affectionate touch, psychological distress, or romantic relationship quality.

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