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**Daily Technoference, Technology Use during Couple Leisure Time,  
and Relationship Quality**

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## Abstract

1  
2 The landscape of couple leisure time has shifted to include and, in some relationships, rely upon  
3 technology use. Technology has the potential to intrude upon face-to-face interactions and  
4 quality time together—i.e., technofence, phubbing. However, it is also likely that couples  
5 engage in shared technology use, which could lead to bonding. In the current work, we examined  
6 one's own, one's partner's, and shared technology use during couple time across 10 days and the  
7 potential impacts on couple-time satisfaction, conflict, and relationship quality. We utilized data  
8 from 145 couples who completed a baseline online survey and 10 days of daily online surveys  
9 concerning leisure time spent together with their partner and their technology use. Multilevel  
10 mediational modeling revealed within-person associations between own and partner technology  
11 use with daily leisure satisfaction and leisure conflict. Small, but significant within-person  
12 indirect effects on daily relationship quality through leisure satisfaction and conflict were also  
13 found for own and partner technology use. In other words, results implied a pathway where  
14 technology use impacts one's satisfaction with and conflict during time spent together, and then  
15 this (dis)satisfaction and conflict impacts daily relationship quality. Although shared technology  
16 use was also a significant predictor, its effects were not robust.

17

18

19 *Keywords:* Adults; media effects; mobile phones; human-technology interaction; interpersonal  
20 communication; multitasking

21

22



1 during couple time across 10 days and the potential impacts on couple-time satisfaction and  
2 ultimately relationship quality.

3         The amount of alone time couples spend together has increased over the last 50 years  
4 (Genadek, Flood, & Garcia Roman, 2016). This is encouraging, as many couples value the time  
5 they spend together and view this time as important for maintaining and improving their  
6 relationship (Moore & Henderson, 2018). Many people also indicate that they experience  
7 happiness and meaning during time spent together with their partner (Flood & Genadek, 2015).  
8 Couple time is so important that individuals often expect undivided attention during intimate  
9 couple times (e.g., during conversations), which may include minimal technology use during  
10 “hanging out” times, such as watching TV together (Miller-Ott & Kelly, 2015). Although  
11 minimal technology use might be ideal, technology is pervasive in most cultures, including the  
12 U.S., where the present study is based. Recent statistics show that 92% of adults own a cell or  
13 smartphone (Anderson, 2015) and 90% or more keep the phone with them at almost all times  
14 (Rainie & Zickuhr, 2015). Multitasking with technology also appears to be common: About 50%  
15 of individuals’ media consumption occurs while multitasking with other media (Voorveld &  
16 Viswanathan, 2015). Considering the importance of couple time and the potential disruptions  
17 technology may bring, it is critical to examine how technology is used during this important and  
18 valued time in people’s lives.

19         Prior work on phone and technology use during face-to-face couple time has  
20 demonstrated the potential for negative impacts on relationship satisfaction and feelings. For  
21 example, when partners are distracted by their technology while in the presence of their partner,  
22 studies have shown the potential for couple conflict, poorer relationship satisfaction, depression,  
23 and lower life satisfaction (Amichai-Hamburger & Etgar, 2016; Halpern & Katz, 2017;

1 Krasnova, Abramova, Notter, & Baumann, 2016; McDaniel & Coyne, 2016; McDaniel et al.,  
2 2018; Roberts & David, 2016; Wang, Xie, Wang, Wang, & Lei, 2017). Indeed, many individuals  
3 express feeling sad, bored, angry, or even jealous when their partner uses technology in their  
4 presence (Krasnova et al., 2016), and interactions may also feel less enjoyable (Brown et al.,  
5 2016; Dwyer, Kushlev, & Dunn, 2018). Furthermore, in one of the only longitudinal analyses of  
6 these processes, Halpern and Katz (2017) found that frequency of texting predicted worse  
7 relationship quality later on, but not vice versa, which provides evidence that technology use  
8 during time together can influence relationship quality and that this is not only a selection effect  
9 (i.e., it is not simply that individuals in poor relationships are more likely to turn to their phones).

10         Prior work has suggested that these negative effects may arise for a variety of reasons.  
11 Symbolic interactionism (Denzin, 1992) suggests that our interactions represent symbols which  
12 can send a message to our partner about what one values in the relationship; thus, when one uses  
13 technology alone but in the presence of a partner this may send the message that the device is  
14 valued more than the partner. This may also lead to feelings of exclusion (David & Roberts,  
15 2017; Hales et al., 2018). This technology use also displaces the deep, high quality interactions  
16 that could take place during time spent together (i.e., displacement hypothesis; McCombs, 1972;  
17 McDaniel & Coyne, 2016). Additionally, social exchange theory (Thibault & Kelley, 1959)  
18 suggests that individuals are attuned to their relationships and are constantly assessing the level  
19 of rewards and costs experienced in the relationship, with the intent of maximizing rewards and  
20 minimizing costs—therefore, producing a rewarding relationship. As technology use intrudes  
21 upon the relationship, there is the potential for individuals to experience fewer rewarding  
22 interactions and also greater costs (such as conflict over technology use and negative emotions),  
23 which could lead to dissatisfaction (see McDaniel, Galovan, Cravens, & Drouin, 2018). Indeed,

1 some experimental and observational studies of friendship dyads have demonstrated that  
2 individuals view phone-distracted interactions as less enjoyable (Brown et al., 2016; Dwyer et  
3 al., 2018). As this phone distraction occurs over time, dissatisfaction with time spent together  
4 could grow, which may cause overall relationship quality to deteriorate, as well.

5         At the cross-sectional, between-person level, studies have confirmed this conceptual  
6 model. For example, McDaniel et al. (2018) found, in a nationally representative sample of  
7 couples in the U.S. and Canada, that technofence from a partner was associated with greater  
8 relationship conflict and ultimately lower relationship satisfaction. Yet, these results are limited  
9 by the measurement being conducted contemporaneously, at only one point in time, which  
10 allows only for comparisons between individuals or couples (i.e., do participants who report  
11 more technofence also report worse relationship feelings?), and by requiring participants to  
12 report concerning a typical day, which reports can be biased by memory recall and other mental  
13 heuristics (e.g., Bolger et al., 2003). In the current study, we sought to examine these processes  
14 across daily reports, which reduces memory biases and allows for a within-person examination  
15 of the natural fluctuations in technology use and relationship feelings from day-to-day. As  
16 opposed to a between-person analysis, which cannot make conclusions concerning differences in  
17 the levels of variables within individuals, a within-person examination allows us to ask questions  
18 such as how fluctuations in one variable affect or are associated with fluctuations in another  
19 variable.

20         These more nuanced analytical methods may help to reduce the methodological issues  
21 that both limit the generalizability of research and that may also lead to false conclusions. As an  
22 example, researchers investigating the relationship between social media use and life satisfaction  
23 have often suggested that social media use has a negative effect on well-being, but a recent meta-



1 analysis by Appel, Marker, & Gnambs (in press) showed that when the effects of social media on  
2 various aspects of well-being are combined, the effects are quite small. Additionally, Orben,  
3 Dienlin, & Przybylski (2019) used longitudinal data sets to disentangle between- and within-  
4 person effects and found that the effect of social media use on adolescents' life satisfaction is  
5 small and dependent on the analytic methods employed. These findings are similar to those of  
6 Orben and Przybylski (2019) who found, using specification curve analysis, that digital  
7 technology contributes very little to the variation in adolescent well-being. In sum, researchers  
8 have suggested that more detailed and advanced statistical designs and analyses may more  
9 accurately answer the questions policymakers and scientists have about technology use and well-  
10 being.

11         Recently, two studies have utilized more intensive data designs, similar to the method of  
12 the current study, assessing individuals across 7 to 14 days (Kushlev & Heintzeman, 2018;  
13 McDaniel & Drouin, 2019). These authors found negative impacts of phone distraction in face-  
14 to-face interactions on the perceived quality of face-to-face communication, feelings of  
15 connection, emotional well-being, and relationship quality (Kushlev & Heintzeman, 2018;  
16 McDaniel & Drouin, 2019). However, these studies differ from the current study as Kushlev and  
17 Heintzeman (2018) did not focus on couples in romantic relationships, and McDaniel and  
18 Drouin (2019)—although focused on couples—had a narrow focus on daily technofence  
19 during conversations and activities with their partner. Additionally, these studies did not examine  
20 the potential for many different types of technology use to occur simultaneously, i.e., own use,  
21 partner use, and shared technology use. In the current study, we focus more broadly on the  
22 leisure time couples spend together, regardless of the specific activity in which couples were  
23 engaged, and we also differentiate between own, partner, and shared technology use.

1           Unlike own or partner technology use, which may lead to dissatisfaction with time spent  
2 together, conflict, and a host of negative feelings in relationships, it is possible that shared  
3 technology use may lead to positive feelings about time spent together and overall better  
4 relationship quality. Prior work has suggested that shared or joint leisure time activities are  
5 related to greater relationship satisfaction and stability (Girme, Overall, & Faingataa, 2014;  
6 Gomillion et al., 2017; Hill, 1988; Johnson et al., 2006; Kretz, 2019; Leggert & Roussouw,  
7 2014), and recent work examining participants' qualitative reports of their typical evening  
8 routines with their romantic partners revealed that shared technology use was commonly  
9 reported and was linked with greater relationship satisfaction (Drouin & McDaniel, under  
10 review). Examining shared use with our theoretical lenses, engaging in an activity together is  
11 likely viewed as a symbol of desire for closeness and feels inclusive, leading individuals to  
12 experience greater relational rewards. This shared use can also be a way for partners to express  
13 or gain common interests and immerse themselves in the narratives of shows or stories, which  
14 can also lead to increased intimacy and connection between partners (Gomillion et al., 2017).

15           In the current study, we examined technology use by oneself and one's partner, as well as  
16 shared technology use, and the potential impacts this use might have on individuals' feelings  
17 about their time spent together, conflict during time spent together, and ultimately their  
18 relationship quality. We specifically examined this pathway through leisure time satisfaction and  
19 leisure time conflict, as prior work has found that time spent together is important for  
20 relationship satisfaction and stability (e.g., Hill, 1988; Johnson et al., 2006). Previous work has  
21 shown how technology may influence the quality of this time as well as individuals' feelings  
22 about how their time is spent. If individuals are devoted to enjoying this potentially intimate time  
23 with their partner, relationships may benefit; yet, if individuals are not fully dedicated and

1 engaged with their partner during this time spent together, relationships may stagnate or  
2 deteriorate (e.g., Girme et al., 2014). In the current study, these processes were examined via  
3 daily survey reports from both partners in couples. Based on the prior literature and theory cited  
4 above, we hypothesized the following. Additionally, we also explored potential differences by  
5 participant gender.

6 H1: as technology use is quite common, technology use, in all its forms (i.e., own use,  
7 partner use, and shared use), would occur during couple time on the majority of  
8 days.

9 H2: (a) technology use by oneself (own use) and one's partner (partner use) would  
10 predict lower satisfaction with time spent together, while (b) shared technology use  
11 would predict greater satisfaction with time spent together.

12 H3: (a) technology use by oneself (own use) and one's partner (partner use) would  
13 predict greater conflict during time spent together, while (b) shared technology use  
14 would predict lower conflict during time spent together.

15 H4: (a) satisfaction with the time spent together and (b) conflict during time spent  
16 together would act as mediators through which technology use impacts daily  
17 relationship quality.

## 18 **Method**

### 19 **Participants & Procedure**

20 Participants were 155 heterosexual couples who had been in a relationship for at least 6  
21 months or longer from *Project INTERACT* (INternet, TEchnology, Romance, And Couple Time), a  
22 daily survey study of couples' time spent together and technology use. The participants were  
23 recruited through announcements in the local community and on professional organization

1 listservs, as well as through contacting those who had expressed interest after completing a  
2 different survey on Amazon Mturk. Both partners completed daily online surveys. In the current  
3 study, we utilized data from 145 couples who completed a baseline online survey and the daily  
4 survey portion of the study, in which we had data from 144 women and 142 men within these  
5 couples, with 141 couples having daily data from *both* partners within the couple.<sup>1</sup> Couples  
6 resided in the U.S. The majority (93%) of couples were in a relationship of 2 years or longer ( $M$   
7 = 9.42 years,  $SD = 8.76$ ) and married (71%). Most were Caucasian (79% for women, 81% for  
8 men). On average, women were 32.49 years old ( $SD = 9.36$ ; range 20 to 66), men were 34.31  
9 ( $SD = 9.89$ ; range 22 to 71), and median yearly household income was approximately \$62,500  
10 ( $M = \$68,435$ ,  $SD = \$38,923$ ), but ranged extensively from \$5,000 to \$200,000 or more; 65% of  
11 women and 56% of men had a Bachelor's degree or higher.

12         Participants first completed informed consent. Then, both partners separately completed  
13 an online baseline survey that included demographics (such as age, race, and income). About  
14 two weeks after completing their baseline survey, both partners separately completed 10  
15 consecutive nights of online surveys.<sup>2</sup> Although partners completed their surveys separately, they  
16 completed the surveys on the same nights at approximately the same times shortly before bed.  
17 The daily survey link was emailed to participants on the first day of their nightly surveys.  
18 Participants then used this same link to complete their nightly survey each night. A text message  
19 reminder (“Please remember to complete your daily survey before you go to bed”) was sent to  
20 participants’ phones each night (at 9PM Central US time) for 10 nights. Participants were

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<sup>1</sup> A part of the data was presented previously as a research poster at the *National Council on Family Relations Conference* in November 2018, titled “Daily technoference, technology use during couple leisure time, and relationship satisfaction.” <https://www.ncfr.org/index.php/ncfr-2018/session/poster-session-4>

<sup>2</sup> Although participants were instructed to complete 10 days, some participants completed more than 10 days. Within a 14-day period, 23 participants completed 11 days and 4 participants completed 12 days. All days of data provided by participants were included in our analyses.

1 compensated with a \$2.00 Amazon gift card for completing their baseline survey, and then for  
2 their daily surveys participants were compensated with another Amazon gift card at a rate of  
3 \$0.50 per completed day plus a \$5.00 bonus for completing at least 7 days (thus, the daily survey  
4 compensation maximum was \$10.00). Participants completed an average of 8.80 days ( $SD = 2.18$   
5 days) of relationship quality data, with 89% completing 7 or more days, for a total of 2517 days  
6 of relationship quality data; inside of these total days, participants were together with their  
7 partner for at least some of the time on 2238 days (89%). Finally, participants reported spending  
8 some leisure time together with their partner on 1998 days (80%). On days when participants  
9 reported some leisure time with their partner (1998 days), participants reported on this leisure  
10 time. On days when participants reported no leisure time with their partner but at least some time  
11 together with their partner (240 days), participants reported on this general time together on  
12 those days. The daily measures are explained hereafter. In daily measurement, it is common for  
13 measures to be reduced to a few items or even single items in order to reduce participant burden  
14 and burnout.

## 15 **Measures**

16 On each night that participants reported time spent with their partner sometime that day,  
17 participants were asked to think and respond about their most recent episode of leisure or time  
18 spent together with their partner. In the instructions, this specifically referred to *leisure time* if  
19 the participant had rated they had had leisure time with their partner that day, but referred to *time*  
20 *together* if the participant had rated that they did not have leisure with their partner that day. In  
21 all analyses, we include whether participants were reporting on leisure or couple time as a  
22 control variable.

1           We performed a multilevel confirmatory factor analysis (MCFA) on all the daily scales /  
2 items for males and a MCFA for females and found that two items from the relationship quality  
3 scale (ambivalence and conflict) had lower factor loadings on the relationship quality factor and  
4 also cross-loaded with other scales and items. Therefore, these two items were removed from the  
5 relationship quality scale and all models. We describe how the relationship quality scale is  
6 calculated after this below. We also found that the leisure conflict item in the couple leisure  
7 satisfaction scale had a low factor loading on this scale and was therefore broken out as a  
8 separate variable in the analyses. Therefore, below we describe how we measured couple leisure  
9 satisfaction and couple leisure conflict. The final MCFA with the scales and items indicated  
10 below fit the data well for males (CFI = 0.99, TLI = 0.98, SRMR within = 0.03, SRMR between  
11 = 0.03) and for females (CFI = 0.98, TLI = 0.96, SRMR within = 0.02, SRMR between = 0.06).

12           When multiple items were used in a daily measure, reliability was calculated as the  
13 reliability of assessing within-person changes ( $R_c$ ; Shrout & Lane, 2012). This estimate is  
14 calculated by first decomposing the variability in the daily items in the scale using an ANOVA  
15 approach (and based on generalizability theory) into variance components, such as variance  
16 across items, days, and participants. We calculated the variance components utilizing Proc  
17 VARCOMP in SAS 9.4, and this analysis is run on a long format dataset where each item has its  
18 own line in the dataset on each day. Then, we utilized the variance components from Proc  
19 VARCOMP in SAS; the coefficient is calculated as the *day X participant* variance divided by the  
20 *day X participant* variance plus *error variance* (which error variance is divided by the number of  
21 items in that scale) (Shrout & Lane, 2012).

22           **Own Technology Use.** Participants were asked, “How much (what proportion of) time  
23 did YOU spend on or use technology ALONE? For example, looking at your phone, tablet, or

1 computer instead of focusing on the activity or time you and your partner were spending  
2 together.” Participants responded on a 7-point scale: 0 (*None*), 1 (*Only a little bit*), 2 (*Less than*  
3 *half the time*), 3 (*About half the time*), 4 (*More than half the time*), 5 (*Almost the entire time*), 6  
4 (*The entire time*).

5 **Partner Technology Use.** Participants were asked, “How much (what proportion of)  
6 time did YOUR PARTNER spend on or use technology ALONE? For example, looking at  
7 his/her phone, tablet, or computer instead of focusing on the activity or time you and your  
8 partner were spending together.” Participants responded on the same 7-point scale.

9 **Shared Technology Use.** Participants were asked, “How much (what proportion of) time  
10 did YOU AND YOUR PARTNER use technology TOGETHER? For example, watching TV,  
11 movies, or videos together, sharing or looking at social media together, playing a game on your  
12 mobile device together, surfing the web, video chatting with friends together, etc.” Participants  
13 responded on the same 7-point scale.

14 **Couple Leisure Satisfaction and Couple Leisure Conflict.** Participants responded to 3  
15 items concerning their feelings about that episode of time spent together with their partner. The  
16 items referred to leisure or simply their time together depending on what type of time together  
17 with their partner the participant had rated that day. As explained above in the MCFAs, the items  
18 were split into two items referring to satisfaction (including “I’m happy with the way we spent  
19 our (leisure) time together” and “Our (leisure) time spent together was fine”) and one item  
20 referring to conflict (“Our couple (leisure) time was a source of conflict”). Items were adapted  
21 from Miller-Ott et al. (2012). Participants rated their answers on a 5-point scale ranging from 1  
22 (*Strongly disagree*) to 5 (*Strongly agree*). For satisfaction with shared leisure / time spent  
23 together, daily ratings across the two items were averaged to produce an overall score each day

1 for each participant, with higher scores indicating greater satisfaction with shared leisure or time  
2 spent together ( $R_c = .88$ ). The single item referred to above represented daily conflict during  
3 shared leisure / time spent together.

4 **Relationship Quality.** Each night, participants responded to 6 items concerning their  
5 overall feelings about their couple relationship (Totenhagen, Serido, Curran, & Butler, 2012).  
6 As explained above in the MCFAs, the conflict and ambivalence items were removed from the  
7 scale, leaving the scale with 4 items (i.e., love, satisfaction, commitment, and closeness). Items  
8 were on a 7-point scale ranging from 1 (*Not very much or just a little*) to 7 (*Very much or a lot*).  
9 Items were averaged to create an overall relationship quality score each day for each participant  
10 ( $R_c = .88$ ).

#### 11 **Analysis Plan**

12 First, as the daily data is made up of both between-person and within-person processes,  
13 we examined the between-person and within-person correlations with a multilevel structural  
14 equation model (MSEM) in Mplus version 8.4 (Muthén & Muthén, 2017). In this model, we  
15 allowed the daily variables to covary freely at both levels and examined the standardized results  
16 at each level. Mplus latently split the variance in each daily variable into its between- and within-  
17 person variance. This MSEM was utilized to properly account for the nesting (e.g., individuals  
18 across days) and to calculate accurate significance levels at each level.

19 To examine our main hypotheses, we conducted a within-person mediation model  
20 analysis in Mplus (Muthén & Muthén, 2017; Bolger & Laurenceau, 2013). Daily predictor  
21 variables were first split into between-person and within-person portions in SAS 9.4 (as is  
22 standard practice in daily data; Bolger & Laurenceau, 2013). Between-person variables give  
23 estimates of between-person differences (e.g., Do those who share technology use more often



1 show greater leisure satisfaction as compared with those who share technology use less often?).  
2 Conversely, the within-person variables are of particular interest in this study and are what our  
3 models focus on, as these allow us to examine whether fluctuations from day-to-day in our  
4 technology use variables are linked with fluctuations in daily outcome variables (e.g., Regardless  
5 of one's average level of shared technology use, when a participant experiences more shared  
6 technology use than their typical amount do they also show more leisure satisfaction than  
7 usual?). To account for non-independence between partners, within-person partners' reports on  
8 the same constructs were allowed to correlate within couples. Men's and women's estimates  
9 were estimated separately and simultaneously, as recommended for dyadic daily data (e.g.,  
10 Bolger & Laurenceau, 2013). We evaluated when own, partner, or shared technology use was  
11 greater on a given day than normal if this was associated with worse than normal leisure  
12 satisfaction (model 1) or greater than normal leisure conflict (model 5). We also evaluated how  
13 greater than normal levels of either leisure satisfaction or leisure conflict were associated with  
14 relationship quality levels on a given day. To assess mediation, we then computed the indirect  
15 effects from each of the daily technology use variables to daily relationship quality through  
16 either leisure satisfaction or leisure conflict and evaluated if these effects were significant. We  
17 also examined whether gender differences existed in model paths by constraining the paths  
18 across men and women and evaluating if model fit was significantly worse with the constraints.  
19 In all models, these constraints did not significantly worsen model fit, suggesting that effects  
20 were similar for both genders. In the models, we utilized only those days on which participants  
21 reported having at least had some time with their partner that day, and we controlled for whether  
22 the time the participant was reporting on was leisure or non-leisure time spent together. On days

1 when only one partner responded to the surveys, full information maximum likelihood  
2 estimation accounted for missing partner data.

3 Our initial analysis assumed a continuous incremental effect of technology use on both  
4 leisure satisfaction and leisure conflict. To consider if this assumption was accurate, we  
5 conducted a sensitivity analysis to evaluate how alternative coding of the technology use  
6 variables might influence the results or if the effects of technology use were robust to the coding  
7 of technology use. We looked at technology use coded dichotomously in three separate ways on  
8 a given day: (1) no technology use compared to any technology use, (2) no technology use or a  
9 little bit of technology use compared to more than a little bit of technology use, and (3)  
10 technology use for less than half of the time compared to technology use of half or more of the  
11 time.

12 As a post-hoc exploratory analysis, we then evaluated how differences between one's  
13 perceptions of his/her own technology use and his/her perceptions of his/her partner's technology  
14 use were related to leisure satisfaction and leisure conflict. To do this, we computed the absolute  
15 value of the difference between individuals' perceptions of their own and their perceptions of  
16 their partner's technology use. These within-day absolute difference scores were then included in  
17 both model 1 and model 5 along with the original scores (Kenny, Kashy, & Cook, 2006). Thus,  
18 we evaluated how a greater than average perceived difference between oneself and one's partner  
19 in technology use each day was associated with both leisure satisfaction and leisure conflict on  
20 that day after controlling for perceptions of own and partner's technology use on that day.

21 Although there were many potential exploratory analyses we could have conducted, we chose  
22 this analysis on individuals' own perceptions of themselves and their partner as compared to  
23 other potential models (such as utilizing the difference between one's own technology use and

1 the partner's report of their own technology use), as it is impossible to know which partner's  
2 report of technology use is the most accurate (a common issue in almost all dyadic research), and  
3 it was beyond the scope of this paper to examine all potential dyadic models.

## 4 **Results**

5 We had hypothesized that technology use in all its forms would occur during couple time  
6 on the majority of days. We therefore first examined how often technology use happened in our  
7 sample. In support of H1, participants reported that technology use during couple time occurred  
8 at least "a little bit" or more often on 67% of the days (own technology use), 67% of the days  
9 (partner technology use), and 69% of the days (shared technology use). Examining how  
10 frequently technology use was rated as occurring "about half the time" or more often, we found  
11 this occurred on about 15% (own), 17% (partner), and 39% (shared) of the days.

12 Additionally, between-person means and between-person correlations (across all days of  
13 data) between our study variables are reported in Table 1 (see this table for all correlation  
14 estimates in this paragraph). At the between-person level, individuals' perceptions of their own  
15 and their partner's technology use were highly correlated, suggesting that individuals who are  
16 likely to use technology during couple time also often perceive their partner as using during  
17 couple time. This is also supported by the significant correlation between one's own technology  
18 use and one's partner's perception of their own use. Shared use, however, was not correlated  
19 with own or partner technology use. The expected associations also often appeared for own use  
20 and partner use with leisure satisfaction, leisure conflict, and relationship quality. However, the  
21 expected associations for shared use only appeared for women. Finally, leisure satisfaction,  
22 leisure conflict, and relationship quality were all correlated, as expected. In other words, those  
23 individuals who tend to be heavier technology users or perceive their partners as being heavier

1 technology users tend to feel less satisfied with and experience more conflict in their couple  
2 leisure time and feel worse about their relationship overall. For women only, those with higher  
3 perceived time spent sharing technology use with their partner tend to be those experiencing less  
4 conflict during shared leisure and who feel better about their relationship overall.

5 As shown in Table 2, at the within-person level, daily fluctuations in own and partner  
6 technology use were significantly correlated with fluctuations in leisure satisfaction and leisure  
7 conflict. For men, fluctuations in their daily perceptions of own and partner use were not  
8 associated with daily relationship quality, although fluctuation in perceptions of shared use was  
9 associated with relationship quality, as well as leisure satisfaction and conflict. For women,  
10 shared use was correlated with leisure satisfaction, but not leisure conflict or relationship quality.  
11 However, women's perceptions of partner use correlated with fluctuations in women's  
12 relationship quality. Leisure satisfaction, leisure conflict, and relationship quality were all  
13 correlated, as expected.

14 **H2: Technology use would predict satisfaction with time spent together.**

15 Model 1 in Figure 1 addresses hypothesis 2a and 2b, and in support of H2a own use and  
16 partner use predicted leisure satisfaction at the within-person level. On days when individuals  
17 used their own device more often than their average use ( $\beta = -.09, p < .001$ ) as well as perceived  
18 their partner as using their device more often than the partner's typical use ( $\beta$ s =  $-.11$  to  $-.10, p <$   
19  $.001$ ) satisfaction with time spent together was lower, which would be classified as small effects  
20 (Cohen, 1988). Conversely, when individuals engaged in shared technology use (H2b) more than  
21 their average shared use, they experienced greater satisfaction with their time spent together ( $\beta$ s  
22 =  $.05$  to  $.06, p < .05$ ).

1           The sensitivity analysis results in models 2, 3, and 4 in Figure 1 add clarity and  
2 understanding to the association between own and partner technology use and leisure  
3 satisfaction. When comparing the effect of *no* own technology use to *any* own use, we found that  
4 any use on a particular day was associated with a 0.15 to 0.16 standard deviation decrease in  
5 leisure satisfaction that day ( $p < .01$ ). When including a *little bit* of own use with *no use*, this  
6 effect was no longer significant. In contrast, when own use of *no use* to *less than half the time*  
7 was compared to own use of *half or more of the time*, the effects were again significant ( $\beta$ s  
8 ranged from  $-.17$  to  $-.19$ ,  $p < .01$ ). Thus, greater own use on a given day was associated with  
9 lower leisure satisfaction that day, while the lower leisure satisfaction levels for those with a  
10 little bit of own use seems to have suppressed the effect when it was coded to be combined with  
11 no use (i.e., the effect of a little bit of own use is not similar to the effect no own use). Turning to  
12 *partner* technology use inside of the sensitivity analysis, when perceptions of *no* partner  
13 technology use was compared to *any* technology use, there was no difference in leisure  
14 satisfaction. However, when *no* use and a *little bit* of use on a given day were combined and  
15 compared with *more than a little bit* of partner use, individuals reported lower leisure  
16 satisfaction, with more than a little bit of partner use on a given day being associated with 0.16 to  
17 0.18 standard deviations lower scores than their usual leisure satisfaction level ( $p < .001$ ). The  
18 effect of partner technology use seemed to be strongest on days when partners were perceived to  
19 use technology for *half or more* of the time compared to *less than half* the time ( $\beta$ s ranged from  $-$   
20  $.25$  to  $-.28$ ,  $p < .001$ ). Overall, these sensitivity results suggest that even a *little bit* of *own*  
21 technology use on a given day was associated with lower levels of leisure satisfaction, while  
22 *more than a little bit* of *partner* technology use on a given day was associated with lower levels  
23 of leisure satisfaction (or put another way, perceiving a *little bit* of partner use on a given day

1 had no effect; there must be *more than a little bit* of partner use to matter for feelings of  
2 satisfaction with time together). Sensitivity analyses revealed no significant effects for shared  
3 use, suggesting that the effect of shared use may be quite small, less robust, and thus perhaps less  
4 meaningful.

5 **H3: Technology use would predict conflict in time spent together.**

6 Model 5 in Figure 2 addressed hypothesis 3a and 3b, and in partial support of H3a partner  
7 use predicted leisure conflict at the within-person level. On days when individuals perceived  
8 their partner as using their device more often than their average use, they experienced greater  
9 conflict during time spent together ( $\beta = .10$  to  $.11$ ,  $p < .001$ ), while shared use predicted less  
10 conflict (H3b;  $\beta = -.05$ ,  $p < .05$ ). However, greater own use (H3a;  $\beta = .00$ , *ns*) did not predict  
11 conflict.

12 The sensitivity analysis results in models 6, 7, and 8 in Figure 2 also add clarity and  
13 understanding to the association between partner technology use and leisure conflict. In contrast  
14 to the leisure satisfaction results, when *no* partner technology use was compared to *any* partner  
15 technology use, individuals reported increased levels of leisure conflict, with any partner use on  
16 a given day being associated with 0.16 to 0.17 standard deviation higher scores than their usual  
17 leisure conflict level ( $p < .01$ ). However, when *no* use and a *little bit* of use on a given day were  
18 combined and compared with *more than a little bit* of partner use, there was no difference in  
19 leisure conflict levels. Although counterintuitive at first, this result suggests that higher leisure  
20 conflict levels for those perceiving a little bit of partner use seems to have suppressed the overall  
21 effect of partner use when it was coded to be combined with no partner use. In other words, the  
22 effect of a little bit of partner use is not similar to the effect of no partner use. Finally, on days  
23 when partners were perceived to use technology for *half or more* of the time compared to *less*

1 *than half* of the time, individuals also reported increased levels of leisure conflict ( $\beta$ s ranged  
2 from .16 to .17,  $p < .05$ ). Thus, these results suggest that even a *little bit* of partner use was  
3 linked to leisure conflict (in contrast to effects for leisure satisfaction, where partner use had to  
4 be perceived as *more than a little bit* to see an effect on satisfaction). Sensitivity analyses  
5 revealed no significant effects for shared use, suggesting that the effect of shared use may again  
6 be quite small, less robust, and thus perhaps less meaningful.

7 **H4: Satisfaction with and conflict during time spent together would both mediate the**  
8 **effects of technology use on daily relationship quality.**

9 In Model 1 in Figure 1, leisure satisfaction was significantly linked with daily  
10 relationship quality ( $\beta = .30$  to  $.32$ ,  $p < .001$ ), such that on days when individuals were more  
11 satisfied with time spent together with their partner they also felt more satisfied with their  
12 relationship. Own technology use showed a significant, albeit small, indirect effect on daily  
13 relationship quality through leisure satisfaction ( $\beta = -.03$ ,  $p < .05$ ), and the same was found for  
14 partner technology use ( $\beta = -.03$ ,  $p < .01$ ) and shared technology use ( $\beta = .02$ ,  $p < .05$ ).

15 The sensitivity analyses clarified that when *no* own technology use was compared with  
16 *any* own technology use on a given day, relationship quality scores that day were 0.05 standard  
17 deviations lower than usual ( $p < .01$ ) through the effect on leisure satisfaction. In the comparison  
18 of the combination of *no* own technology use and a *little bit* of technology use compared to *more*  
19 *than a little bit*, individuals did not report lower than their usual levels of relationship quality ( $\beta$   
20  $= -.03$ ,  $p = .074$ ), coinciding with the prior sensitivity results described for the main effect of own  
21 use (i.e., a little bit of use is not similar to no use, as those with even a little bit of use show lower  
22 leisure satisfaction). Comparing individuals' days with technology use *less than half* of the time

1 with those with technology use for *half or more* of the time, we found that more technology use  
2 was again indirectly associated with lower relationship quality ( $\beta = -.05, p < .05$ ).

3 For partner technology use, the sensitivity analyses clarified that when *no* partner  
4 technology use was compared with *any* partner technology use on a given day, relationship  
5 quality scores were no different than usual, while in the comparison of *no* partner technology use  
6 and a *little bit* of technology use compared to *more than a little bit*, individuals reported lower  
7 than their usual levels of relationship quality ( $\beta = -.05, p < .001$ ) through the effect on leisure  
8 satisfaction. Comparing individuals' days with technology use *less than half* of the time with  
9 those with technology use for *half or more* of the time, we found that more technology use was  
10 also indirectly associated with lower relationship quality ( $\beta = -.08, p < .001$ ) through the effect  
11 on leisure satisfaction.

12 Consistent with the sensitivity analyses of the effect of shared technology use on leisure  
13 satisfaction—which showed no significant effects—the indirect effect of shared technology use  
14 on relationship quality through leisure satisfaction was not significant in the sensitivity analyses.

15 In Model 5 in Figure 2, leisure conflict was significantly linked with daily relationship  
16 quality ( $\beta = -.18$  to  $-.19, p < .001$ ), such that on days when individuals experienced more conflict  
17 during time spent together they also felt less satisfied with their relationship. Partner technology  
18 use showed a significant, albeit small, indirect effect on daily relationship quality through leisure  
19 conflict ( $\beta = -.02, p < .001$ ). The sensitivity analyses clarified that when *no* partner technology  
20 use was compared with *any* partner technology use on a given day, relationship quality scores  
21 that day were .03 standard deviations lower than usual ( $p < .01$ ) through the effect on leisure  
22 conflict, while in the comparison of *no* partner technology use and a *little bit* of technology use  
23 to *more than a little bit*, levels of relationship quality were no different than usual (again, this



1 coincides with the main effects reported previously in sensitivity analyses). Comparing  
2 individuals' days with technology use *less than half* of the time with those with technology use  
3 for *half or more* of the time, we found, however, that more technology use was associated with  
4 lower relationship quality through the effects on leisure conflict ( $\beta = -0.03, p = .064$ ).

5 Consistent with the sensitivity analyses of the effect of shared technology use on leisure  
6 conflict—which showed no significant effects—the indirect effect of shared technology use on  
7 relationship quality through leisure conflict was also not significant in the sensitivity analyses.

### 8 **Dyadic Exploratory Analyses on Technology Use**

9 Correlations between men's and women's daily reports are shown in Tables 1 and 2 (in  
10 columns 7 through 12, rows 1 through 6). Men's and women's technology use is significantly  
11 correlated, with partners who tend to get on their own technology during couple leisure more  
12 likely to also have partners who are likely to get on their own technology (between,  $r = .56, p <$   
13  $.001$ ), and on days when one gets on their own technology more than usual their partner also  
14 rates themselves as getting on their own technology more than usual (within  $r = .25, p < .001$ ). In  
15 terms of cross partner reports (own report of own use versus partner's report of their partner's  
16 use), partners' reports of an individual's technology use were correlated (between,  $r = .68$  to  $.72,$   
17  $p < .001$ ; within,  $r = .28$  to  $.31, p < .001$ ), suggesting that partner perceptions of each individual's  
18 use were similar although not exactly the same. Additionally, partner reports of shared  
19 technology use were correlated (between,  $r = .63, p < .001$ ; within,  $r = .55, p < .001$ ).

20 According to the same individual's perception, individuals perceived themselves and  
21 their partners as using technology an equal amount on 69% and 63% of days, according to men  
22 and women respectively. However, comparing each individual's perception of their own use,  
23 partners used technology on their own an equal amount to one another on 41% of days. Partners

1 aligned perfectly on their perceptions of men's own use on 44% of days and aligned perfectly on  
2 perceptions of women's own use on 43% of days. Partners' perceptions of shared technology use  
3 aligned perfectly on 41% of days.

4 Finally, we ran a post-hoc exploratory model (as explained in the analysis plan) utilizing  
5 the within-person portion of the daily absolute difference score variable (an individual's  
6 perception of their own use versus the same individual's perception of their partner's use). A  
7 greater absolute difference between one's perception of their own use and their perception of  
8 their partner's use on a given day was associated with lower leisure satisfaction on that day ( $\beta = -$   
9  $.12$  to  $-.13$ ,  $p < .01$ ) as well greater leisure conflict on that day ( $\beta = .06$  to  $.07$ ,  $p < .05$ ).  
10 Importantly, the main effects for own use on leisure satisfaction remained (satisfaction  $\beta = -.11$   
11 to  $-.10$ ,  $p = .01$ ; conflict  $\beta$ s =  $0.002$ , *ns*), as did the main effects for partner use for both leisure  
12 satisfaction ( $\beta$ s =  $-.06$ ,  $p < .05$ ) and leisure conflict ( $\beta$ s =  $.08$ ,  $p < .05$ ). There were significant  
13 indirect effects of perceived partner difference in technology use on relationship quality through  
14 leisure satisfaction ( $\beta = -.04$ ,  $p < .001$ ) as well as through leisure conflict ( $\beta = -.02$ ,  $p < .01$ ),  
15 though these indirect effects on daily relationship quality were very small.

## 16 Discussion

17 The current study examined individuals' perceptions of their own, their partner's, and  
18 shared technology use during shared couple time over 10 consecutive days and potential impacts  
19 on satisfaction with and conflict during time spent together as well as overall daily relationship  
20 quality. Overall, we found that distraction with technology (perceptions of own and partner use  
21 during shared couple time) predicted less satisfaction with leisure or time spent together and  
22 perceptions of partner use predicted more conflict during leisure or time spent together. Contrary  
23 to our expectations, engaging in greater shared technology use on a given day was *not* found to

1 be a *robust and practically meaningful* predictor of satisfaction with or conflict during couple  
2 leisure or time spent together. Finally, results revealed a potential pathway where technology use  
3 impacts one's satisfaction with or conflict during couple leisure and time spent together, and then  
4 this (dis)satisfaction and conflict impacts daily relationship quality.

5         Our results are in line with prior cross-sectional studies, which suggested that distraction  
6 due to technology devices in couple interactions and time spent together are associated with  
7 worse relational well-being (e.g., McDaniel & Coyne, 2016; Roberts & David, 2016). These  
8 results also align with our theoretical models that individual technology use in the presence of  
9 one's partner can send a symbol or message to a partner that the technology is more valued than  
10 their time spent together (e.g., symbolic interactionism; Denzin, 1992). This solo technology use  
11 also displaces time that could have been spent interacting with or engaging with the partner  
12 (displacement hypothesis; McCombs, 1972), which could have a negative effect on one's  
13 perception of the overall quality of time spent together with their partner. Moreover, individuals  
14 who perceive partner disengagement may experience conflict over technology use and/or  
15 decreased enjoyment of this shared time (Brown et al., 2016; Dwyer et al., 2018; McDaniel et al.,  
16 2018; McDaniel & Drouin, 2019). Using social exchange theory (Thibault & Kelley, 1959) as a  
17 frame for understanding the pathways of these negative effects, this could lead to a decrease in  
18 the level of perceived rewards as well as an increase in the potential costs one is receiving from  
19 the relationship, resulting in a decline in overall relationship satisfaction (McDaniel et al., 2018;  
20 McDaniel & Drouin, 2019). On the other hand, shared use would be perceived as a relational  
21 benefit. However, our results did not align with our hypotheses for shared use. We discuss this  
22 later in the Discussion.

1           Although own and partner technology use were both associated with lower leisure  
2 satisfaction, perceptions of partner use appeared to be more important than own use for  
3 predicting conflict during the leisure episode. In other words, individuals' use of their own  
4 technology in the presence of their partner may distract them from the interaction and reduce  
5 their satisfaction with their couple time, while conflict between partners is more likely to occur  
6 when one perceives their *partner* as using during their shared time. Prior work has found that  
7 perceiving a partner's use as interfering with or interrupting shared couple time may create more  
8 negative feelings about the relationship than one's own technology use (e.g., Amichai-  
9 Hamburger & Etgar, 2016; McDaniel et al., 2018). In one study, this was found to be the case  
10 even when individuals engaged in this behavior more than their partner (Amichai-Hamburger &  
11 Etgar, 2016). This is likely due to actor-observer bias (Jones & Nisbett, 1972), where individuals  
12 are more likely to ascribe more positive intentions and reasons to their own use, while  
13 simultaneously connecting a partner's use to a lack of caring about the interaction or the  
14 relationship. An additional caveat here though, the sensitivity analyses revealed that a little bit of  
15 partner use was not detrimental to leisure satisfaction (although even a little bit of partner use  
16 was associated with leisure conflict). It was only when one perceived their partner as engaging in  
17 use more than a little bit that their feelings of satisfaction about leisure and the relationship  
18 suffered, whereas individuals felt worse about their leisure and the relationship on days when  
19 they used their own device even a little bit. This suggests that a partner's use only has an effect  
20 on satisfaction once it becomes noticeable and one can still enjoy their time with their partner  
21 when their partner uses their device occasionally during their shared time, while one's own use  
22 (even a little bit) inherently reduces one's ability to focus on and enjoy their time spent together.  
23 This is also likely a bidirectional process where dissatisfactory or boring leisure may lead an

1 individual to be more likely to withdraw into their technology (Al-Saggaf et al., 2019); yet, if  
2 this occurred, then theoretically the technology use should serve to disconnect and also impact  
3 interactional quality and feelings about the relationship further.

4         Of note, we also found that the discrepancy between individuals' perceptions of their own  
5 use and their perceptions of their partners' use was associated with lower satisfaction with and  
6 greater conflict during time spent together; these effects were significant over and above the  
7 main effects of own and partner use. This suggests that, besides own and partner use having an  
8 effect on how individuals feel about their time and relationship, on days when an individual  
9 perceives a mismatch between their own and their partner's technology use this individual will  
10 feel even worse about their couple time and relationship. This is an important finding as it  
11 suggests that focusing on reducing the technology use of one's partner could potentially improve  
12 the relationship, but would simultaneously negatively impact the relationship if an individual  
13 does not also reduce their own use. In other words, partners are interdependently linked and the  
14 impact of technology use on relationships is multiply determined by *both* partners' actions  
15 (Thibault & Kelley, 1959; Cox & Paley, 1997).

16         Contrary to our hypotheses, shared use did not show the robust relational benefit we  
17 expected. This lack of a robust effect may stem from the fact that shared technology use was  
18 more common during shared couple time as compared with own or partner solo use in our study  
19 (e.g., about half the time or more often in 39% vs 15% - 17%) and is a common practice during  
20 leisure (e.g., Kretz, 2019). Put another way, our hypothesis was based on the idea that sharing  
21 activities together could build common interests and demonstrate desire for closeness (Denzin,  
22 1992; Gomillion et al., 2017); however, this conception assumes an intentionality about the  
23 shared technology use that may not have actually been present, as shared technology use (such as

1 TV watching) may at times be an activity that is simply an easy and almost thoughtless activity  
2 to do together. It is likely that there were many days where shared technology use was not  
3 something that was actively planned and seen as meaningful. Additionally, many of the days  
4 when shared technology use occurred own and/or partner technology use also occurred, which  
5 suggests that own and partner use during shared use (e.g., multitasking) may also detract from  
6 the possible benefits of shared use. These ideas are demonstrated in how time spent together  
7 could occur as joint time (Johnson et al., 2006), where couples are engaged with one another and  
8 focused on the activity (e.g., a conversation), or as parallel time (Holman & Jacquart, 1988),  
9 where couples do not interact much or at all during the activity. It is quite possible that the kinds  
10 of shared technology use engaged in by couples might best be described as parallel time (instead  
11 of joint time)—e.g., passively watching TV next to each other. Prior work has found that time  
12 with one's partner is not connected to better relationship satisfaction when both partners are not  
13 dedicated to and engaged in the activity or their time together (Girme et al., 2014). Therefore,  
14 although some studies have found positive associations between shared technology use and  
15 relationship quality (e.g., Drouin & McDaniel, under review; Kretz, 2019; Gomillion et al.,  
16 2017), to see the effects on a daily basis of shared technology use, couples would likely need to  
17 be more actively engaged with one another during its use. Future work could experimentally  
18 examine whether shared technology use has different effects based on whether one or both  
19 partners also engage in solo technology use. Prior work and our theories would suggest that such  
20 multitasking interactions would be less rewarding (e.g., Amichai-Hamburger & Etgar, 2016;  
21 Denzin, 1992; Dwyer et al., 2018; McDaniel & Drouin, 2019; Thibault & Kelley, 1959).

22 In the current study, we chose to have individuals' in couples report on their most recent  
23 couple leisure time or time spent together with their partner that day. This was done in order to

1 reduce recall bias, as it has been found that individuals are often not accurate reporters of their  
2 own phone or technology use (e.g., Boase & Ling, 2013; Yuan et al., 2019). However, in general  
3 individuals are much better at remembering specific details about their lives when asked to report  
4 on discrete episodes of time (Harms et al., 2019; Gershuny, 2015). This was a strength of our  
5 current study. However, it also means that all effects observed in this study are the effects of one  
6 small episode of time spent together with a partner (and likely an episode that was in the  
7 evening/nighttime), which may be one reason for the small size of the effects on daily  
8 relationship quality. Put another way, we did not examine how technology was utilized by both  
9 partners and the couple throughout the *entire day*, nor did we examine the many other potential  
10 activities and stresses that individuals engaged in and experienced throughout each day—which  
11 it is clear from prior work are also linked to daily relationship quality (e.g., Debrot, Cook, Perrez,  
12 & Horn, 2012; Lavee & Ben-Ari, 2007; McDaniel, Teti, & Feinberg, 2018; Totenhagen et al.,  
13 2012). Additionally, although observed effects were small, a larger, moderate effect was  
14 observed for when one perceived their partner as using *technology half or more of the time*  
15 during the leisure episode (i.e., decrease in leisure satisfaction of .25 to .28 standard deviations),  
16 and it is possible that even small effects across many different leisure episodes throughout days,  
17 weeks, months, and years could build up to become larger effects on relationship feelings over  
18 time.

19         Although we did not focus in the current work on the between-person effects (as most  
20 prior studies have focused on the between-person effects), an examination of the correlations in  
21 Tables 1 and 2 reveal what appear to be stronger effects at the between-person level as compared  
22 to the within-person level. As one of many potential examples, the correlations for relationship  
23 quality with own use are -.28 to -.35 (between-person) versus -.04 (within-person), with partner

1 use are  $-.39$  to  $-.43$  versus  $-.03$  to  $-.09$ , and with shared use are  $.13$  to  $.24$  versus  $.06$  to  $.07$ . This  
2 suggests that if we had collected only one time point of data and/or only compared people to  
3 different people in a sample (between-person comparisons), much like has been done in most of  
4 the previous research, the effects would have appeared to be much larger than they actually are  
5 when attempting to assume within-person, causal links between variables (when the researchers  
6 do not have within-person data/effects). It is also possible that we would have concluded that  
7 shared technology use was more important than it actually is, especially for women. A strength  
8 of our current work is that we matched our temporal design, methods and analyses to our  
9 theoretical assumptions (e.g., Collins, 2006), instead of utilizing between-person data and effects  
10 to make potentially inaccurate conclusions about how daily technology use and daily relationship  
11 processes function in individuals and couples.

12 Overall, the current study results add to the literature by examining day-to-day  
13 fluctuations (within-person) in technology use during couple time and impacts on satisfaction  
14 with couple time and relationship quality. These within-person effects add a more meaningful  
15 examination of these processes, as we were not comparing individuals to other individuals;  
16 instead, we were able to examine fluctuations within people from day-to-day and what these  
17 daily (real life) fluctuations in use meant for individuals and couples. Generally, these findings  
18 contribute to the literature on technology and well-being; however, our methodology and  
19 analytic methods also add to the growing repertoire of more nuanced studies examining the  
20 relationships between digital technology and well-being (e.g., Appel et al., in press; Orben et al.,  
21 2019; Orben & Przybylski, 2019).

22 Based on our findings, we suggest that relationship deterioration (or growth) may occur  
23 from individuals' seemingly small and insignificant choices about when to and not to pick up a



1 device while around a romantic partner. Although this could be motivated by disengagement  
2 from a partner, it may also be an innocent behavior with the unintended consequence of a partner  
3 feeling less satisfied with time spent together. Therefore, we recommend that individuals,  
4 families, practitioners, and educators examine closely their daily technology use or the  
5 technology use of their clients. For practitioners and educators, if their clients are not feeling  
6 satisfied with the time spent with their partner, this may be indicative of risk for relationship  
7 deterioration and changes that need to be made to technology use and/or expectations concerning  
8 technology use. Indeed, discussions of expectations concerning technology use are critical, as  
9 individuals may have different expectations than their partner as well as different expectations  
10 from one context or activity to the next even in the same night (e.g., Miller-Ott et al., 2015).  
11 However, practitioners and educators should also be careful to not focus solely on technology  
12 use, as effects were small (although small effects across many different leisure episodes  
13 throughout weeks, months, and years could build up to larger effects), which suggests that (as  
14 would be expected) there are many other ways couples engage or disengage throughout the day  
15 that are not necessarily technology-related.

16         The current study does not support utilizing shared technology use as a relationship  
17 building exercise—at least not unintentional shared use. Although testing this hypothesis was  
18 beyond the scope of this study, it is still possible that intentional and actively planned shared  
19 technology use could lead to greater relationship satisfaction. In other words, we cannot  
20 definitively say that all types of shared use would have no positive effects on relationships. At  
21 the very least, our results for own and partner technology use suggest indirectly that focusing on  
22 the shared couple time activity as opposed to engaging in distracted time together would likely  
23 be needed to realize the full potential benefits of shared activities such as shared technology use.

## 1 **Limitations & Conclusion**

2           Although the current data and analysis is unique and brings many advantages, such as the  
3 ability to examine within-person daily fluctuations inside of couples, we also acknowledge that  
4 our study has limitations. The current analyses rely on individuals' perceptions of their use,  
5 which may or may not accurately characterize their actual use. However, utilizing daily diary  
6 designs reduces the potential for memory and recall biases and typically improves the accuracy  
7 of reports (Bolger et al., 2003). Our sample was of couples residing in the U.S. who had been in  
8 a relationship for at least 6 months, and therefore our results cannot generalize to individuals in  
9 romantic relationships that are just beginning to form (i.e., relationship lengths of fewer than 6  
10 months). Additionally, although all U.S. regions were represented in our sample, these results  
11 may or may not generalize to other countries around the world. It is most likely that these results  
12 would generalize to Western countries with similar cell phone penetration rates. Finally, the  
13 individuals in our sample tended to be, on average, satisfied with their relationships. Therefore,  
14 these processes may look different in samples of at-risk or highly unsatisfied couples. It is  
15 important to point out though that even in highly satisfied couples, small changes in daily  
16 technology use were linked to changes in daily relationship quality. As with any correlational  
17 data, it is possible that the effects could be reversed in direction in some or all participants or on  
18 some or all days, such that feelings about the relationship or time spent together might also drive  
19 solo and shared technology use. Moreover, we did not examine what type of technology (e.g.,  
20 smartphone, TV, tablet, etc.) was being used, nor did we examine the media content or activities  
21 being engaged in while using these technologies. In the future, it would likely be of interest to  
22 examine whether type of technology and media content/activities moderated the effects observed  
23 in our study or whether simply the extent of the intrusion of various technology devices (e.g.,

1 technoferece) and solo technology use during shared couple time in general produces an overall  
2 effect.

3           Although the technology was used by individuals, partners, and in shared ways on the  
4 majority of days during their shared couple time—making technology use and minor technology  
5 distractions (i.e., technoferece) a common experience in relationships—on days when  
6 individuals and partners engaged in more technology use, satisfaction with couple time, levels of  
7 leisure conflict, and daily relationship quality suffered. In addition, engaging in shared  
8 technology use related to more positive feelings about couple time and daily relationship quality,  
9 but effects of shared use were very small and not robust. Therefore, it is important to be mindful  
10 of our seemingly inconsequential technology use as well as to be more fully engaged during our  
11 time spent with romantic partners.

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### **Disclosure Statement**

The authors have no conflicts of interest to declare.

### **Data Availability Statement**

The data that support the findings of this study cannot be shared with the public due to our protection of human subjects agreements with participants. The de-identified data and analyses were examined by the reviewers during the peer review process. The survey items, analysis syntax, results output (as well as a table of the unstandardized estimates, standardized estimates, standard errors, and confidence intervals for the main models 1 and 5) can be found here:

<https://osf.io/tu8yn/>

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4

1

Table 1.  
Descriptives and between-person correlations between main study variables

	<i>Men</i>						<i>Women</i>					
	1. Own	2. Partner	3. Shared	4. Leisure Sat.	5. Leisure Conflict	6. Relat. Qual.	7. Own	8. Partner	9. Shared	10. Leisure Sat.	11. Leisure Conflict	12. Relat. Qual.
<i>Men</i>												
1. Own technology use	--	.91***	.04	-.35**	.37**	-.28**	.56***	.72***	.01	-.25*	.13	-.26*
2. Partner technology use		--	.03	-.51***	.45***	-.39***	.68***	.67***	.01	-.38***	.17	-.36***
3. Shared technology use			--	.19	-.13	.13	-.02	.01	.63***	.18	-.12	.11
4. Leisure satisfaction				--	-.45***	.73***	-.32**	-.25*	.05	.65***	-.39**	.47***
5. Leisure conflict					--	-.50***	.38**	.33**	-.08	-.31**	.50***	-.44***
6. Relationship quality						--	-.26*	-.25**	.05	.51***	-.47***	.61***
<i>Women</i>												
7. Own technology use							--	.71***	.11	-.42***	.20	-.35**
8. Partner technology use								--	.09	-.41***	.35*	-.43**
9. Shared technology use									--	.19	-.25*	.24*
10. Leisure satisfaction										--	-.46***	.69***
11. Leisure conflict											--	-.62***
12. Relationship quality												--
<i>ICC</i>	.29	.31	.23	.39	.23	.59	.29	.31	.22	.34	.23	.57
<i>Mean</i>	1.20	1.32	2.17	4.12	1.49	6.15	1.33	1.37	2.06	4.03	1.50	6.11
<i>Standard Deviation</i>	0.70	0.73	0.99	0.53	0.43	0.85	0.75	0.83	0.99	0.53	0.44	0.84

Note. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ . Between-person correlation values and significance levels, ICC, Mean, and Standard Deviation are estimates from the Mplus model used to examine the between-person and within-person correlations. ICC = Intraclass correlation, which represents the proportion of variance due to between-person differences. These values are based only on those days of data when participants indicated they had had at least some time together that day, and Mplus indicated it was able to perform these estimates on 144 couples in the dataset.

2

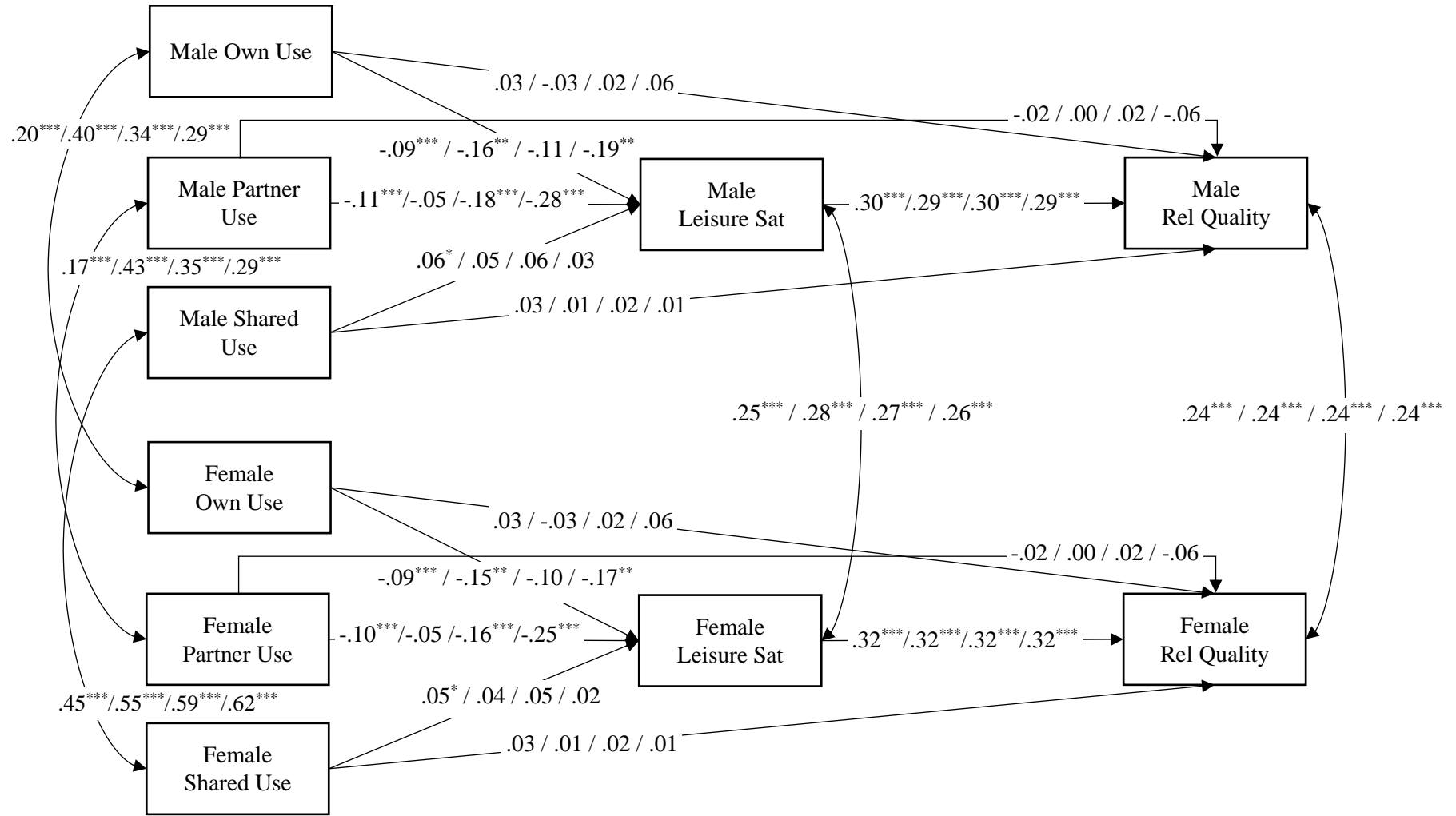
1

Table 2.  
Within-person correlations between main study variables

	<i>Men</i>						<i>Women</i>					
	1. Own	2. Partner	3. Shared	4. Leisure Sat.	5. Leisure Conflict	6. Relat. Qual.	7. Own	8. Partner	9. Shared	10. Leisure Sat.	11. Leisure Conflict	12. Relat. Qual.
<i>Men</i>												
1. Own technology use	--	.61***	.04	-.14***	.07*	-.04	.25***	.28***	.09*	-.10**	.06	-.03
2. Partner technology use		--	.07	-.14***	.08†	-.03	.31***	.20***	.05	-.13***	.06	.00
3. Shared technology use			--	.08**	-.06*	.07*	.03	.03	.55***	.10**	-.04	.08*
4. Leisure satisfaction				--	-.27***	.35***	-.06	-.10*	.10**	.37***	-.21***	.26***
5. Leisure conflict					--	-.22***	.06	.10**	-.07*	-.19***	.28***	-.20***
6. Relationship quality						--	-.06	-.09*	.01	.22***	-.22***	.39***
<i>Women</i>												
7. Own technology use							--	.67***	.02	-.18***	.08*	-.04
8. Partner technology use								--	.08	-.19***	.14***	-.09*
9. Shared technology use									--	.09**	-.05	.06
10. Leisure satisfaction										--	-.38***	.37***
11. Leisure conflict											--	-.29***
12. Relationship quality												--
<i>Standard Deviation</i>	1.09	1.11	1.81	0.67	0.78	0.72	1.17	1.23	1.85	0.74	0.82	0.74

Note. †  $p < .06$ , \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ . Means are not reported as all means are 0. Within-person correlation values, significance levels, and Standard Deviation are estimates from the Mplus model used to examine the between-person and within-person correlations. These values are based only on those days of data when participants indicated they had had at least some time together that day, and Mplus indicated it was able to perform these estimates on 144 couples in the dataset.

2



**Figure 1. Within-Person Mediation Model with Leisure Satisfaction as a Mediator.**

*Notes.*  $N = 141$  couples. All coefficients are standardized. The first coefficient is in the model with technology use coded on a continuous scale. The remaining 3 coefficients are for alternate codings of technology use in the sensitivity analysis. The second coefficient compares no use with any use. The third compares no use and a little bit of use to more than a little use. The last coefficient compares days with use less than half of the time to those with use half or more of the time (e.g., Continuous Scale / None vs. Any Use / None & Little Bit vs More Than Little Bit of Use / Use for  $< 50\%$  vs Use for  $\geq 50\%$ ).  $*** p < .001$ ,  $** p < .01$ ,  $* p < .05$ . Estimates were constrained to be equal across males and females, as this did not worsen model fit.