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

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Abstract

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

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

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

The landscape of couple leisure time has shifted over recent years to include and, in some relationships, rely upon technology use. For example, 90% of American adults use a device in the evening shortly before bedtime (Gradisar et al., 2013), and 94% to 98% of U.S. adults age 18 to 49 years report using phones during a recent social interaction (Rainie & Zickuhr, 2015). Although the growth in device use is not alarming on its own, this rapid growth has led to the potential for it to intrude upon face-to-face interactions and quality time spent together (McDaniel & Coyne, 2016; Roberts & David, 2016). The interference in relationships and interactions from the plethora of technology devices often found in individuals' lives (e.g., phones, tablets, computers, TV, etc.) has been termed "technoference" (a combination of technology and interference; McDaniel & Coyne, 2016), while the interference specifically from phones—a common form of technoference (e.g., McDaniel & Drouin, 2019)—has been termed "phubbing" (a combination of phone and snubbing; Roberts & David, 2016). This technoference and device use may create a space and time where couples are physically present but only spending distracted time together and where interactions are of lower quality (Aagaard, 2016; Amichai-Hamburger & Etgar, 2016; Turkle, 2011). However, it is also likely that couples engage in shared technology use while together (Gomillion, Gabriel, Kawakami, & Young, 2017; Kretz, 2019), which may function similarly to the sharing of other couple activities and could potentially lead to further bonding. Regardless of whether technology use disrupts or enhances couple relationships, it is likely that amount and type of technology use fluctuates day-to-day. Thus, in the current work, we examined one's own, one's partner's, and shared technology use

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Method

Participants & Procedure

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

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

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

[1] 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

[2] 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.

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

Measures

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

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

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

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

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

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

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

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

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

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

Analysis Plan

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

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

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

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

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

As a post-hoc exploratory analysis, we then evaluated how differences between one's perceptions of his/her own technology use and his/her perceptions of his/her partner's technology use were related to leisure satisfaction and leisure conflict. To do this, we computed the absolute value of the difference between individuals' perceptions of their own and their perceptions of their partner's technology use. These within-day absolute difference scores were then included in both model 1 and model 5 along with the original scores (Kenny, Kashy, & Cook, 2006). Thus, we evaluated how a greater than average perceived difference between oneself and one's partner in technology use each day was associated with both leisure satisfaction and leisure conflict on that day after controlling for perceptions of own and partner's technology use on that day. Although there were many potential exploratory analyses we could have conducted, we chose this analysis on individuals' own perceptions of themselves and their partner as compared to other potential models (such as utilizing the difference between one's own technology use and

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

Results

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

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

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

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

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

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

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

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

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

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

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

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

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

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

The sensitivity analyses clarified that when *no* own technology use was compared with *any* own technology use on a given day, relationship quality scores that day were 0.05 standard deviations lower than usual ($p < .01$) through the effect on leisure satisfaction. In the comparison of the combination of *no* own technology use and a *little bit* of technology use compared to *more than a little bit*, individuals did not report lower than their usual levels of relationship quality (β = -.03, p = .074), coinciding with the prior sensitivity results described for the main effect of own 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 leisure satisfaction). Comparing individuals' days with technology use *less than half* of the time

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

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

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

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

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

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

Dyadic Exploratory Analyses on Technology Use

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

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

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

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

Discussion

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Limitations & Conclusion

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

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

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

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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/

References

Aagaard, J. (2016). Mobile devices, interaction, and distraction: a qualitative exploration of absent presence. *AI & Society, 31*(2), 223-231.

Al-Saggaf, Y., MacCulloch, R., & Wiener, K. (2019). Trait boredom is a predictor of phubbing frequency. *Journal of Technology in Behavioral Science, 4*(3), 245-252.

Amichai-Hamburger, Y., & Etgar, S. (2016). Intimacy and smartphone multitasking—A new oxymoron? *Psychological Reports, 119*(3), 826-838. doi:10.1177/0033294116662658

Anderson, M. (2015). Technology device ownership: 2015. *Pew Research Center.* Retrieved from: http://pewinternet.org/2015/10/29/technology-device-ownership-2015/

Appel, M., Markera, C., & Gnambs, T. (in press). Are social media ruining our lives? A review of meta-analytic evidence. *Review of General Psychology.*

Boase, J., & Ling, R. (2013). Measuring mobile phone use: Self-report versus log data. *Journal of Computer-Mediated Communication, 18*(4), 508-519.

Bolger, N., Davis, A., & Rafaeli, E. (2003). Diary methods: Capturing life as it is lived. *Annual Review of Psychology, 54*, 579-616. doi: 10.1146/annurev.psych.54.101601.145030

Bolger, N. & Laurenceau, J. P. (2013). *Intensive longitudinal methods: An introduction to diary and experience sampling research.* New York: Guilford Press.

Brown, G., Manago, A. M., & Trimble, J. E. (2016). Tempted to text: College students' mobile phone use during a face-to-face interaction with a close friend. Emerging Adulthood, 4(6), 440-443.

Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences (2nd ed.)*. New York, NY: Lawrence Erlbaum.

Collins, L. M. (2006). Analysis of longitudinal data: The integration of theoretical model, temporal design, and statistical model. *Annual Review of Psychology*, *57*, 505-528.

Cox, M. J., & Paley, B. (1997). Families as systems. *Annual Review of Psychology*, *48*(1), 243-267.

David, M. E., & Roberts, J. A. (2017). Phubbed and alone: Phone snubbing, social exclusion, and attachment to social media. *Journal of the Association for Consumer Research*, *2*(2), 155-163.

Debrot, A., Cook, W. L., Perrez, M., & Horn, A. B. (2012). Deeds matter: Daily enacted responsiveness and intimacy in couples' daily lives. *Journal of Family Psychology*, *26*(4), 617-627.

Denzin, N. K. (1992). *Symbolic interactionism and cultural studies: The politics of interpretation*. Oxford: Blackwell.

Drouin, M., & McDaniel, B. T. (under review). *Technology use during evening routines, bedtime satisfaction, and impacts on individual and relational well-being.*

Dwyer, R. J., Kushlev, K., & Dunn, E. W. (2018). Smartphone use undermines enjoyment of face-to-face social interactions. *Journal of Experimental Social Psychology*, *78*, 233-239.

Flood, S. M., & Genadek, K. R. (2016). Time for each other: Work and family constraints among couples. *Journal of Marriage and Family*, *78*(1), 142-164.

Genadek, K. R., Flood, S. M., & Roman, J. G. (2016). Trends in spouses' shared time in the United States, 1965–2012. *Demography*, *53*(6), 1801-1820.

Gershuny, J. (2015). Time use research methods. In J. Wright (Ed.), *International Encyclopedia on the Social & Behavioral Sciences* (2nd ed.). Elsevier.

Girme, Y. U., Overall, N. C., & Faingataa, S. (2014). “Date nights” take two: The maintenance function of shared relationship activities. *Personal Relationships*, *21*(1), 125-149.

Gomillion, S., Gabriel, S., Kawakami, K., & Young, A. F. (2017). Let’s stay home and watch TV: The benefits of shared media use for close relationships. *Journal of Social and Personal Relationships*, *34*(6), 855-874.

Gradisar, M., Wolfson, A. R., Harvey, A. G., Hale, L., Rosenberg, R., & Czeisler, C. A. (2013). The sleep and technology use of Americans: findings from the National Sleep Foundation's 2011 Sleep in America poll. *Journal of Clinical Sleep Medicine*, *9*(12), 1291-1299.

Hales, A. H., Dvir, M., Wesselmann, E. D., Kruger, D. J., & Finkenauer, C. (2018). Cell phone-induced ostracism threatens fundamental needs. *The Journal of Social Psychology*, *158*(4), 460-473.

Halpern, D., & Katz, J. E. (2017). Texting's consequences for romantic relationships: A cross-lagged analysis highlights its risks. *Computers in Human Behavior*, *71*, 386-394.

Harms, T., Gershuny, J., Doherty, A., Thomas, E., Milton, K., & Foster, C. (2019). A validation study of the Eurostat Harmonised European Time Use Study (HETUS) diary using wearable technology. *BMC Public Health*, *19*(2), 455.

Hill, M. S. (1988). Marital stability and spouses’ shared time: A multidisciplinary hypothesis. *Journal of Family Issues*, *9*, 427-451.

Holman, T. B., & Jacquart, M. (1988). Leisure-activity patterns and marital satisfaction: A further test. *Journal of Marriage and the Family*, 69-77.

Johnson, H. A., Zabriskie, R. B., & Hill, B. (2006). The contribution of couple leisure involvement, leisure time, and leisure satisfaction to marital satisfaction. *Marriage and Family Review, 40*, 69-91.

Jones, E. E., & Nisbett, R. E. (1972). The actor and the observer: Divergent perceptions of the causes of behavior. In E. E. Jones, D. E. Kanouse, H. H. Kelly, R. E. Nisbett, S. Valins & B. Weiner (Eds.), *Attribution: Perceiving the causes of behavior* (pp. 79–94). Morristown, NJ: General Learning Press.

Krasnova, H., Abramova, O., Notter, I., & Baumann, A. (2016). Why phubbing is toxic for your relationship: Understanding the role of smartphone jealousy among "Generation Y" users. *Twenty-Fourth European Conference on Information Systems (ECIS)*, İstanbul,Turkey.

Kretz, V. E. (2019). Television and Movie Viewing Predict Adults' Romantic Ideals and Relationship Satisfaction. *Communication Studies, 70*(2), 208-234.

Kushlev, K., & Heintzelman, S. J. (2018). Put the phone down: Testing a complement-interfere model of computer-mediated communication in the context of face-to-face interactions. *Social Psychological and Personality Science*, *9*(6), 702-710.

Lavee, Y., & Ben-Ari, A. (2007). Relationship of dyadic closeness with work-related stress: A daily diary study. *Journal of Marriage and Family*, *69*(4), 1021-1035.

Leggett, C., & Rossouw, P. J. (2014). The impact of technology use on couple relationships: A neuropsychological perspective. *International Journal of Neuropsychotherapy, 2*, 44–99. doi: 10.12744/ijnpt.2014.0044-0099

McCombs, M. E. (1972). Mass media in the marketplace. *Journalism Monographs, 24*, 1-104.

McDaniel, B. T., & Coyne, S. M. (2016). "Technoference": The interference of technology in couple relationships and implications for women's personal and relational well-being. *Psychology of Popular Media Culture, 5,* 85-98. doi: 10.1037/ppm0000065

McDaniel, B. T., & Drouin, M. (2019). Daily technology interruptions and emotional and relational well-being. *Computers in Human Behavior*. doi: 10.1016/j.chb.2019.04.027

McDaniel, B. T., Galovan, A. M., Cravens, J., & Drouin, M. (2018). Technoference and implications for mothers' and fathers' couple and coparenting relationship quality. *Computers in Human Behavior*, *80*, 303-313.

McDaniel, B. T., Teti, D. M., & Feinberg, M. E. (2018). Predicting coparenting quality in daily life in mothers and fathers. *Journal of Family Psychology*, *32*(7), 904-914.

Miller-Ott, A., & Kelly, L. (2015). The presence of cell phones in romantic partner face-to-face interactions: An expectancy violation theory approach. *Southern Communication Journal*, *80*(4), 253 – 270.

Miller-Ott, A. E., Kelly, L., & Duran, R. L. (2012). The effects of cell phone usage rules on satisfaction in romantic relationships. *Communication Quarterly*, *60*(1), 17-34.

Moore, A. C., & Henderson, K. A. (2018). "Like precious gold": Recreation in the lives of low-income committed couples. *Journal of Leisure Research*, *49*(1), 46-69.

Muthén, L.K., & Muthén, B.O. (1998-2017). *Mplus User's Guide (8th ed.)*. Los Angeles, CA: Muthén & Muthén.

Orben, A., Dienlin, T., & Przybylski, A. K. (2019). Social media's enduring effect on adolescent life satisfaction. *Proceedings of the National Academy of Sciences of the United States of America*. doi:10.1073/pnas.1902058116

Orben, A., & Przybylski, A. K. (2019). The association between adolescent well-being and digital technology use. *Nature Human Behaviour, 3,* 173-182. doi:10.1038/s41562-018-0506-1

Rainie, L., Zickuhr, K., 2015. Americans' views on Mobile etiquette. Pew Internet & American Life Project, Retrieved from: https://www.pewresearch.org/wp-content/uploads/sites/9/2015/08/2015-08-26_mobile-etiquette_FINAL.pdf

Roberts, J. A. & David, M. E. (2016). My life has become a major distraction from my cell phone: Partner phubbing and relationship satisfaction among romantic partners. *Computers in Human Behavior, 54,* 134 – 141. doi: 10.1016/j.chb.2015.07.058

Thibault, J. W. & Kelley, H. H. (1959). *The social psychology of groups.* New York: Wiley.

Totenhagen, C. J., Serido, J., Curran, M. A., & Butler, E. A. (2012). Daily hassles and uplifts: A diary study on understanding relationship quality. *Journal of Family Psychology, 26,* 719–728. doi: 10.1037/a0029628

Turkle, S. (2011). *Alone together: Why we expect more from technology and less from each other*. Old Saybrook, CN: Tantor Media.

Voorveld, H. A., & Viswanathan, V. (2015). An observational study on how situational factors influence media multitasking with TV: The role of genres, dayparts, and social viewing. *Media Psychology, 18*(4), 499-526.

Wang, X., Xie, X., Wang, Y., Wang, P., & Lei, L. (2017). Partner phubbing and depression among married Chinese adults: The roles of relationship satisfaction and relationship length. *Personality and Individual Differences, 110,* 12–17.

Yuan, N., Weeks, H. M., Ball, R., Newman, M. W., Chang, Y. J., & Radesky, J. S. (2019). How much do parents actually use their smartphones? Pilot study comparing self-report to passive sensing. *Pediatric Research, 86*(4), 416-418.

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

	Men						*Women*					
	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.
Men												
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***
Women												
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												--
ICC	.29	.31	.23	.39	.23	.59	.29	.31	.22	.34	.23	.57
Mean	1.20	1.32	2.17	4.12	1.49	6.15	1.33	1.37	2.06	4.03	1.50	6.11
Standard Deviation	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.

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Table 2.
Within-person correlations between main study variables

	Men						*Women*					
	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.
Men												
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***
Women												
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												--
Standard Deviation	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

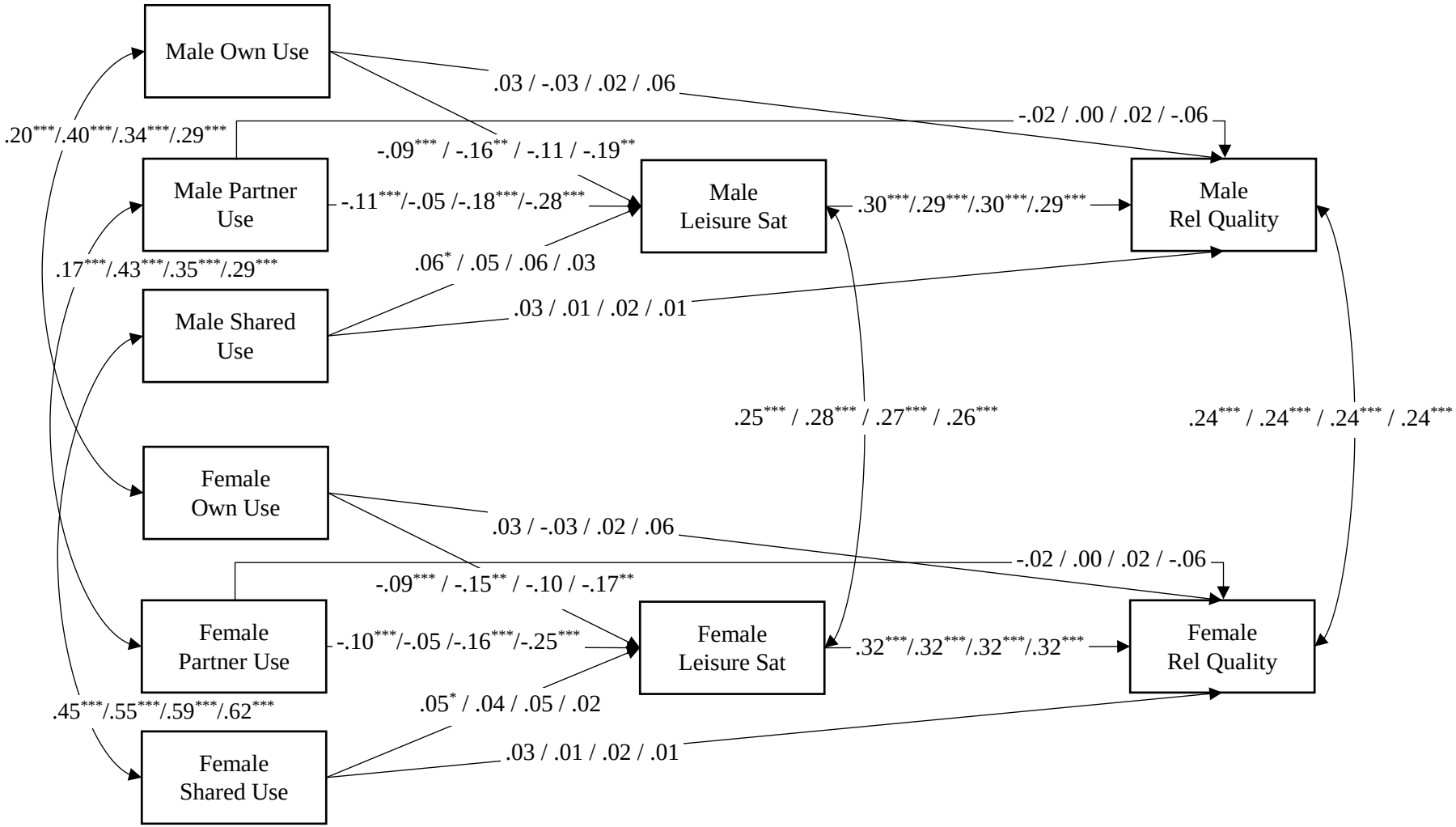

Figure 1. Within-Person Mediation Model with Leisure Satisfaction as a Mediator.

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 >= 50%). *** $p < .001$, ** $p < .01$, * $p < .05$.. Estimates were constrained to be equal across males and females, as this did not worsen model fit.