



THE UNIVERSITY *of* EDINBURGH

Edinburgh Research Explorer

The longitudinal association between narcissism and problematic social networking sites use

Citation for published version:

Hou, X, Ren, S, Rozgonjuk, D, Song, L, Xi, J & Möttus, R 2023, 'The longitudinal association between narcissism and problematic social networking sites use: The roles of two social comparison orientations', *Addictive Behaviors*. <https://doi.org/10.1016/j.addbeh.2023.107786>

Digital Object Identifier (DOI):

[10.1016/j.addbeh.2023.107786](https://doi.org/10.1016/j.addbeh.2023.107786)

Link:

[Link to publication record in Edinburgh Research Explorer](#)

Document Version:

Peer reviewed version

Published In:

Addictive Behaviors

General rights

Copyright for the publications made accessible via the Edinburgh Research Explorer is retained by the author(s) and / or other copyright owners and it is a condition of accessing these publications that users recognise and abide by the legal requirements associated with these rights.

Take down policy

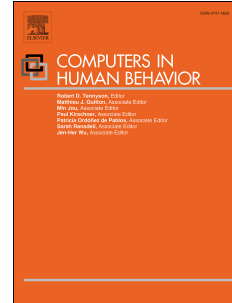
The University of Edinburgh has made every reasonable effort to ensure that Edinburgh Research Explorer content complies with UK legislation. If you believe that the public display of this file breaches copyright please contact openaccess@ed.ac.uk providing details, and we will remove access to the work immediately and investigate your claim.



Journal Pre-proof

Perceived partner phubbing predicts lower relationship quality but partners' enacted phubbing does not

Katherine B. Carnelley, Laura M. Vowels, Sarah C.E. Stanton, Abigail Millings, Claire M. Hart



PII: S0747-5632(23)00211-X

DOI: <https://doi.org/10.1016/j.chb.2023.107860>

Reference: CHB 107860

To appear in: *Computers in Human Behavior*

Received Date: 20 February 2023

Revised Date: 22 June 2023

Accepted Date: 23 June 2023

Please cite this article as: Carnelley K.B., Vowels L.M., Stanton S.C.E., Millings A. & Hart C.M., Perceived partner phubbing predicts lower relationship quality but partners' enacted phubbing does not, *Computers in Human Behavior* (2023), doi: <https://doi.org/10.1016/j.chb.2023.107860>.

This is a PDF file of an article that has undergone enhancements after acceptance, such as the addition of a cover page and metadata, and formatting for readability, but it is not yet the definitive version of record. This version will undergo additional copyediting, typesetting and review before it is published in its final form, but we are providing this version to give early visibility of the article. Please note that, during the production process, errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

© 2023 Published by Elsevier Ltd.

Author Contributions

Katherine B. Carnelley: Conceptualization, Writing – original draft. **Laura M. Vowels:** Conceptualization, Formal analysis, Writing – original draft. **Sarah C. E. Stanton:** Conceptualization, Data curation, Funding acquisition, Investigation, Methodology, Project administration, Writing – original draft. **Abigail Millings:** Conceptualization, Writing – review & editing. **Claire M. Hart:** Conceptualization, Writing – review & editing.

Journal Pre-proof

Perceived Partner Phubbing Predicts Lower Relationship Quality but Partners' Enacted Phubbing Does Not

Katherine B. Carnelley¹, Laura M. Vowels², Sarah C. E. Stanton³, Abigail Millings⁴, & Claire M. Hart¹

¹School of Psychology, University of Southampton, Highfield Campus, Southampton SO17 1BJ, United Kingdom (email: k.carnelley@soton.ac.uk, c.m.hart@soton.ac.uk).

²Family and Development research center (FADO), Institute of Psychology, Faculty of Social and Political Sciences, University of Lausanne, 1015 Lausanne, Switzerland (email: laura.vowels@unil.ch)

³Department of Psychology, University of Edinburgh, 7 George Square, Edinburgh EH8 9JZ, United Kingdom (email: sarah.stanton@ed.ac.uk)

⁴Centre for Behavioural Science and Applied Psychology, Sheffield Hallam University (email: A.Millings@shu.ac.uk).

Author Note

This research was supported by New Investigator Grant ES/S005749/1 awarded to Sarah C. E. Stanton by the Economic and Social Research Council (ESRC) of the United Kingdom.

The authors declare no conflicts of interest.

For the purposes of open access, the authors have applied a Creative Commons Attribution (CC BY) license to any author accepted manuscript version arising from this submission.

Direct correspondence to Katherine B. Carnelley, University of Southampton, School of Psychology, Highfield Campus, Southampton SO17 1BJ, United Kingdom (email: k.carnelley@soton.ac.uk).

Journal Pre-proof

**Perceived Partner Phubbing Predicts Lower Relationship Quality but Partners' Enacted
Phubbing Does Not**

Journal Pre-proof

Highlights

We analyzed a dyadic diary study to examine the effects of perceived and enacted phubbing on relationship quality.

Daily perceived phubbing was associated with lower relationship quality day-to-day but not two months later.

Daily enacted phubbing was unrelated to relationship quality.

Perceptions about partner's phubbing are more important than partners' phubbing behavior.

Future research might examine whether targeting phubbing perceptions improves relationship functioning.

Abstract

Perceptions of partner phubbing can be detrimental for romantic relationship functioning. However, research does not typically focus on couple members' reports of their own phubbing behavior and how this relates to relationship functioning. Our aim was to examine both perceptions of partner phubbing and reports of one's own enacted phubbing behavior in a dyadic diary dataset to better specify their effects on relationship functioning at the daily level and two months later. The role of attachment was also examined. Daily perceived phubbing was associated with lower relationship quality; however, these effects did not hold two months later. Importantly, actors' and partners' enacted phubbing was unrelated to relationship quality both daily and two months later. Attachment anxiety and avoidance moderated the above results, although the directions of these effects were not always consistent across models or with previous findings or theorizing. Future research is needed to untangle if and how attachment orientations are reliably linked to phubbing. Together our results suggest that perceptions about partner's phubbing are more important than partners' actual phubbing behavior. Future research should appraise the potential of targeting phubbing perceptions to improve relationship functioning.

Keywords: phubbing, technoference, attachment, relationships, dyadic data, longitudinal

Perceived Partner Phubbing Predicts Lower Relationship Quality but Partners' Enacted Phubbing Does Not

1. Introduction

Advances in technology have had a profound influence on modern-day romantic relationships. Scholars have begun to understand how phubbing (a portmanteau of snubbing and phone or viewing one's partner as ignoring oneself in favor of a smartphone) may undermine personal and relational outcomes. A recent meta-analysis (Courtright & Caplan, 2020) of 37 studies shows that phubbing has a negative effect on views of the partner and couple interactions (average effect $r = -.34$). Perceived partner phubbing has been robustly linked with reports of lower relationship quality in cross-sectional and daily diary studies (e.g., McDaniel & Coyne, 2016). However, very few studies focus on both couple members' reports. In a dyadic daily diary study, we build on past research by examining the effects of both perceived partner phubbing (i.e., the extent to which partner X thinks that partner Y is phubbing them) and one's enacted phubbing behavior (i.e., the extent to which partner Y reports that they have phubbed partner X) on relationship quality (daily and two months later). We also consider the role of adult attachment in these associations.

1.1 Partner Phubbing and Relationship Quality

Perceived partner phubbing has been found to be associated with lower relationship quality in several cross-sectional studies with samples of individuals in romantic relationships (e.g., McDaniel & Coyne, 2016; Roberts & David, 2016; Wang et al., 2017). Halpern and Katz's results (2017) suggest that the effects of partner phubbing on lower relationship quality are due to phone-related conflict and lower intimacy. Similarly, Beukeboom and Pollmann (2021) found that feeling excluded, lower perceived partner responsiveness (caring, understanding, and

validation), and lower intimacy mediated the links between perceived partner phubbing and relationship satisfaction. Furthermore, Vanden Abeele's (2020) conceptual framework suggests that the negative social effects of phubbing are due to the fact that they violate expectations for social interactions; in addition, partners are splitting their attention which signals disinterest that results in feelings of ostracism and exclusion.

Researchers have begun to build on cross-sectional work and have examined daily diary reports of perceived partner phubbing, which are less susceptible to memory bias than cross-sectional studies (e.g., Schneider & Stone, 2016). Thomas et al. (2022) found that daily perceived phubbing is associated with lower relationship satisfaction. Frackowiak et al.'s (2022) work builds on this by examining potential mediators. Although they did not find a significant direct effect of daily perceived phubbing on relationship satisfaction (after accounting for two mediators); their results suggest that the effect of daily perceived phubbing on relationship quality is indirect, via perceptions of lower perceived partner responsiveness and low positive moral judgment. They conclude that appraisal of phubbing is important in determining relationship quality. Furthermore, Frackowiak et al. (2023) find some support for the moderating role of feeling understood or validated for the prediction of negative emotions; for example, those who perceived their partners as low on validation felt most upset on days when phubbing intensity was high. This suggests that if people view their partners as simultaneously able to understand them whilst using their phone, their relationship quality might also be protected.

While much of the research on perceived partner phubbing has relied on correlational designs, experimental work has also found links between perceived phubbing and relationship satisfaction. David and Roberts (2021) manipulated perceived partner phubbing via a task in which participants remembered past partner phubbing. Findings indicated that compared to a

control manipulation, remembering a past phubbing experience led to lower relationship satisfaction. Thus, at the level of the individual, there appear to be reliable links between perceiving being phubbed by one's partner and one's evaluations of the relationship (see Al-Saggaf, 2022 for a review).

Romantic relationships, however, involve more than one person, and dyadic research designs are required to capture both couple members' reports of phubbing to better understand the effects of phubbing on relationship quality. A handful of studies have focused on both couple members' partner phubbing perceptions. Those with cross-sectional designs with couple samples show somewhat mixed results. Hipp and Carlson (2021) found that both own and partners' perceptions of partner technoference (i.e., the ways technology more broadly, including use of tablets, phones, tv, and gaming, may interfere with social interactions) predicted low relationship satisfaction for both partners and predicted low sexual satisfaction for actors only. However, Broning and Wartberg (2022) found that perceived phubbing was associated with lower relationship satisfaction only for men, but not for women. Interestingly, longitudinal dyadic studies have demonstrated some long-lasting effects of phubbing. Chen et al. (2022) found that women's (but not men's) perceived phubbing was associated with lower couple's average relationship quality three months later in a sample of married couples. In a sample of married couples, Booth et al. (2021) assessed perceived technoference (interference from phones/tablets/TV) longitudinally across a longer time-span. They found that Wave 2 reports of perceived technoference predicted lower relationship quality a year later (Wave 3) indirectly via lower perceived partner responsiveness (Wave 2). Dyadic studies using daily diary methods build on these correlational designs, showing consistent results. McDaniel and Drouin (2019) found that on days when participants perceived that their partner was phubbing them more than

their partner typically did, they reported lower relationship quality. Extending this work, McDaniel et al. (2020) examined potential mediators and found that perceived partner phubbing predicted lower relationship quality indirectly via lower satisfaction with leisure time with partner and via higher conflict about partner leisure time.

To our knowledge, prior work on technofence has exclusively focused on perceptions of partner phubbing and has neglected partners' actual reports of their phubbing behavior (i.e., enacted phubbing). However, research by McDaniel et al. (2018) examined couples' reports of their own problematic phone use (e.g., feeling they use their phone too much), a construct that may be associated with one's own phubbing behavior. McDaniel et al. (2018) found in their dyadic data that one partner's self-reports of their own problematic phone use and general media use were positively associated with the other partner's reports of perceived technofence; this technofence predicted conflict over technology use, which was associated with lower relationship satisfaction. In a second study they found similarly that one partner's self-report of their media use predicted the other partner's reports of perceived technofence, and technofence predicted general conflict in the relationships, which was associated with lower relationship satisfaction. Again, in neither of these studies did the researchers directly assess partners' reports of their own phubbing behavior, something we address in the current study.

1.2 The Role of Adult Attachment

Some people perceive more phubbing than others. Research has demonstrated that greater attachment anxiety—reflecting a tendency to worry about rejection and abandonment in relationships—is associated with greater perceived partner technofence (McDaniel et al., 2018), perceived partner phubbing (Roberts & David, 2022), and conflict over cell-phone use (Roberts & David, 2016). As both attachment insecurity (e.g., Carnelley et al., 1996; Hazan &

Shaver, 1987) and perceived phubbing are negatively associated with relationship quality (e.g., McDaniel & Coyne, 2016), researchers have explored whether perceived phubbing serves as a mediator between attachment insecurity and relationship quality. Perceptions of a partner's technoference and conflict over technology use mediate the association between attachment anxiety and lower relationship satisfaction (McDaniel et al., 2018). Conversely, attachment avoidance—reflecting a tendency to be uncomfortable with intimacy and dependence in relationships—does not appear to be associated with perceived partner technoference (e.g., McDaniel et al., 2018). Broning and Wartberg (2022) built on this work and examined attachment and perceived partner phubbing in a dyadic study of long-term couples. They found that both men and women's attachment anxiety was associated with high perceived phubbing, and women with highly avoidant partners perceived more partner phubbing. They also found a gender by attachment interaction such that high (vs. low) avoidant men report more perceived partner phubbing, whereas high (vs. low) avoidant women report less perceived partner phubbing.

As stated earlier, most research examines perceived partner phubbing but does not assess enacted phubbing. Although McDaniel et al. (2018) assessed attachment anxiety and found it predicted perceived technoference, they did not assess enacted phubbing in this study. However, they did find a positive correlation between attachment anxiety and own problematic phone use for women but not men; avoidance was uncorrelated with own problematic phone use for men and women.

Research has begun to examine whether adult attachment orientation moderates the effects of phubbing on relational outcomes. Insecurities may exacerbate the effect of partner phubbing on relationship quality because phubbing may be more likely to signal rejection for

those high in attachment anxiety or high in avoidance as they tend to make negative attributions for ambiguous behaviors (Li et al., in press) like phubbing. Roberts and David (2016) found that not only did cell phone conflict mediate between perceived partner phubbing and relationship satisfaction, but that this effect was stronger among those with higher attachment anxiety. David and Roberts (2021) manipulated phubbing (versus a control condition) and found that for participants high in attachment anxiety, partner phubbing led to more romantic jealousy compared to those low in attachment anxiety. Furthermore, they found that jealousy mediated the link between partner phubbing and relationship satisfaction for those high (but not low) in attachment anxiety. One goal of the present research is to understand how individual differences in attachment anxiety and avoidance are related to partners' daily phubbing and relationship quality.

1.3 Research Overview and Hypotheses

The primary goal of the present research was to investigate the links between partners' daily phubbing on day-to-day relationship quality and relationship quality two months later using a dyadic diary study. Importantly, we assessed both perceived partner phubbing and enacted daily phubbing behavior. We tested several novel hypotheses (see Figure 1) in a dyadic longitudinal correlational study with three phases (Phase 1 [baseline], Phase 2 [14-day diary period], Phase 3 [2-month follow-up]). We pre-registered our research questions and hypotheses on the Open Science Framework

https://osf.io/u6eb2/?view_only=0764a4ee8b1a4a18bb288410da137607.

Research Question 1: How are partners' reports of their perceived phubbing behavior related to relationship quality immediately and over time?

Hypothesis 1 (replication): At the daily level, we are interested in within-person effects. We predict that on days when one's own (actor) or one's partner's (partner) reported perceived phubbing behavior is higher (vs. lower) than usual, one's own (actor) relationship quality will be lower that day.

Hypothesis 2 (novel longitudinal hypothesis): When examining relationship quality longitudinally, we are interested in between-person effects. We predict that one's own (actor) and one's partner's (partner) average levels of perceived phubbing behavior across the 14 days of the diary will be associated with lower relationship quality two months later.

Research Question 2: How are partners' reports of their own phubbing behavior (enacted phubbing) related to relationship quality immediately and over time?

Hypothesis 3 (novel): We predict that on days when one's own (actor) or one's partner's (partner) enacted phubbing behavior is higher (vs. lower) than usual, one's own (actor) relationship quality will be lower that day.

Hypothesis 4 (novel): We predict that one's own (actor) and one's partner's (partner) average levels of enacted phubbing across the 14 days of the diary will be associated with lower relationship quality two months later.

Research Question 3: How do individual differences in attachment anxiety and avoidance relate to partners' phubbing behavior and relationship quality?

There are two theoretically plausible patterns of attachment effects that may emerge in the context of phubbing (1) Partner phubbing may partially explain the typically negative links between attachment anxiety and avoidance and relationship quality (i.e., mediation); in other words, people who are more anxiously or avoidantly attached may experience lower relationship quality because they phub their partner or their partner phubs them (Hypothesis 5). (2)

Alternatively, attachment anxiety and avoidance may exacerbate the typically negative links between partner phubbing and relationship quality (i.e., moderation); that is, people who are more (versus less) anxiously or avoidantly attached may experience particularly low relationship quality when they phub their partner or their partner phubs them (Hypothesis 6).

2. Method

This study was part of a larger research project investigating couples' psychological experiences in relationships and well-being over time. Data were collected in the United Kingdom between January 2020 and May 2020. Phase 3 was carried out during a Covid lockdown. Phases 1-2 were completed before lockdown. More information about the parent project, including the full compendium of measures and previous subprojects preregistered from the dataset, may be viewed at

https://osf.io/ekv6x/?view_only=25c7b0aad7d04be8b164a2d0aa2e6009. Information regarding the current study, including preregistered hypotheses, analytic plan, and code, is available at https://osf.io/u6eb2/?view_only=0764a4ee8b1a4a18bb288410da137607.

2.1 Participants

The sample size for the larger research project was determined by an *a priori* power analysis conducted using the APIMPowerR ShinyApp (Ackerman et al., 2016), which suggested that 100 couples would provide 84% power for small-to-medium cross-sectional effects. To be eligible for the study, participants had to be over the age of 18, fluent in English, involved in a relationship lasting at least three months, and have regular access to the internet. Both members of the couples were required to participate.

Participants were 100 couples (87 mixed-gender, 9 lesbian, 1 gay, 3 gender-diverse) recruited via social media posts, adverts in local magazines, and at a local wedding fair.

Participants were between 18 and 64 years of age ($M = 24.15$ years, $SD = 6.61$ years) and identified primarily as White (85.5%). They were in relationships lasting 3 months to 35.5 years ($M = 2.84$ years, $SD = 4.41$ years). Approximately 85.5% of participants were casually or exclusively dating their current partner, and 14.5% were common-law, engaged, in a civil partnership, or married. A minority of couples (38.0%) were living together. At Phase 3, 98 couples were still together.

2.2 Measures and Procedure

The larger research project had three phases. In Phase 1, each couple attended an in-person 2-hour lab session, where they provided informed consent and then completed a questionnaire battery and some behavioral tasks. In Phase 2, which began the day after the lab session, participants completed a 15-minute series of online questionnaires each day for 14 consecutive days. Individual survey links were sent to each partner at 4:00PM each day and expired at midnight to avoid participants completing multiple surveys at once. The average number of daily surveys completed during Phase 2 was high ($M = 12.96$, $SD = 2.01$). In Phase 3, couples completed an online 45-minute follow-up survey that was sent two months following the end of Phase 2. After Phase 3 was complete, couples were debriefed and each partner was compensated up to GBP-£50.00 depending on how many parts of the study they completed. Across all phases, partners were asked to complete questionnaires separately from each other. In the current study, we used the following measures:

2.2.1 Primary Measures

2.2.1.1 Perceived and Enacted Phubbing. Perceived and enacted phubbing were assessed daily at Phase 2 using 8 items rated on a 5-point scale (1 = *not at all*, 5 = *a great deal*) that were adapted from the Pphubbing Scale (Roberts & David, 2016). Four items assessed

perceptions of the partner's daily phubbing (e.g., "Today, my partner glanced at his/her mobile phone when talking to me") and 4 items assessed reports of one's own enacted daily phubbing (e.g., "Today, when my phone rang or beeped, I pulled it out even if my partner and I were in the middle of a conversation"). Perceived and enacted phubbing scores were calculated by averaging their item ratings, with higher scores indicating greater perceived ($\alpha = .86$) and enacted ($\alpha = .83$) daily phubbing, respectively.

2.2.1.2 Attachment Orientations. Individual differences in adult attachment were assessed at Phase 1 using the Experiences in Close Relationships-12 (ECR-12; Lafontaine et al., 2016), a 12-item measure rated on a 7-point scale (1 = *strongly disagree*, 7 = *strongly agree*) that captures attachment anxiety with 6 items (e.g., "I worry a fair amount about losing my partner") and attachment avoidance with 6 items (e.g., "I don't feel comfortable opening up to romantic partners"). Scores were calculated by averaging items across respective subscales, with higher scores indicating greater attachment anxiety ($\alpha = .80$) and attachment avoidance ($\alpha = .78$), respectively.

2.2.1.3 Relationship Quality. Daily relationship quality was assessed at Phase 2 using a composite of satisfaction, commitment, and trust items from the Perceived Relationship Quality Components Inventory (PRQC; Fletcher et al., 2000). One item captured satisfaction (i.e., "How satisfied are you with your relationship today?"), one item captured commitment (i.e., "How committed are you to your relationship today?"), and one item captured trust (i.e., "How much do you trust your partner today?"). Scores were calculated by averaging items, with higher scores indicating greater daily relationship quality ($\alpha = .86$).

Follow-up relationship quality was assessed at Phase 3 using a composite of satisfaction, commitment, and trust measures. Participants completed the satisfaction subscale of the

Investment Model Scale (IMS; Rusbult et al., 1998), a 5-item measure rated on a 9-point scale (1 = *completely disagree*, 9 = *completely agree*) that assesses how content individuals are in their current relationship (e.g., “Our relationship makes me very happy”). Participants also completed the commitment subscale of the IMS, a 7-item measure rated on a 9-point scale (1 = *completely disagree*, 9 = *completely agree*) that assesses how dedicated individuals are to their current relationship (e.g., “I want our relationship to last for a very long time”). Finally, participants completed Rempel et al.’s (1985) Trust Scale, a 17-item measure rated on a 7-point scale (1 = *strongly disagree*, 7 = *strongly agree*) that assesses how much individuals feel they can depend on their current partner (e.g., “My partner behaves in a very consistent manner”). Initial scores were calculated by averaging responses across subscale items, with higher scores indicating greater satisfaction, commitment, and trust, respectively. To create a relationship quality composite score, we *z*-scored the individual scale scores and then averaged the *z*-scored scales together.

2.2.2 Covariates

We included participant gender, age, and relationship length (assessed at Phase 1) as covariates in analyses.

2.3 Analysis Strategy

The data were analyzed using the Longitudinal Actor-Partner Interdependence Model (Kenny et al., 2006) with hierarchical linear modeling (Raudenbush & Bryk, 2002) that treats three levels of dyadic daily diary data (days nested within individuals nested within couples) as two levels of random variation. The level-1 represents within-person repeated measures variability for the partners, and level-2 represents between-couples variability across the partners (see Laurenceau & Bolger, 2005, for more detail). We estimated both actor and partner effects on

the actor outcome. The dyads were indistinguishable and thus we used a model for indistinguishable dyads. We estimated the models with random slopes and intercepts. We also separated the within- and between-subjects' elements of the predictor variables (actor's and partner's perceived and enacted phubbing) to examine the association between daily level fluctuations in phubbing and relationship quality as well as the average level of phubbing and relationship quality two months later. The within-subjects results can be interpreted as the changes that occur within an individual relative to their own average. For example, an individual will experience lower relationship quality on days when they experience their partner as phubbing them more in the same day compared to the partner's usual level of phubbing. In contrast, between-subjects results can be interpreted as the differences between people. For example, an individual will report lower relationship quality compared to other participants when they experience their partner as phubbing them more compared to other participants. All models included age, gender, and relationship length as covariates. All analyses were conducted in *R* using the *nlme* package.

2.4 Simple models (phubbing predicting relationship quality, no attachment)

First, we estimated a within-person model in which the actor and partner within-person (i.e., daily) perceived (or enacted, in a separate model) phubbing was used to predict the actors' daily relationship quality. We then estimated a between-person model in which we used the actor and partner between-person (i.e., average) perceived (or enacted, in a separate model) phubbing (the average phubbing for each person) to predict relationship quality two months later.

2.4.1 Mediation models (phubbing mediating the link between attachment orientations and relationship quality)

We aimed to estimate 2-1-1 mediation models to test whether phubbing mediated the association between attachment styles and relationship quality. However, the preliminary analyses including both attachment styles as predictors of perceived or enacted phubbing showed that attachment styles were not significantly associated with daily perceived or enacted phubbing and thus we did not run the mediation models.

2.4.2 Moderation models (attachment orientations moderate the association between phubbing and relationship quality)

We estimated a within-person model in which actor and partner's within-person perceived (or enacted, in a separate model) phubbing behavior was used as predictors, actor and partner's attachment anxiety and avoidance were used as moderators, and relationship quality as an outcome. We also estimated a between-person model in which actor and partner's average level of perceived (or enacted, in a separate model) phubbing behavior was used as predictors, actor and partner's attachment anxiety and avoidance were used as moderators, and relationship quality two months later as the outcomes.

3. Results

The means, standard deviations, and zero-order correlations of the main variables can be found in Table 1.

3.1 Perceived Phubbing

The full results for perceived phubbing can be found in Table 2 for daily relationship quality and in Table 3 for relationship quality two months later. The results showed that actors' perception of their partners' daily phubbing was significantly negatively associated with their daily relationship quality on the same day ($B = -0.06, p = .021$). Partner's perception of actors' phubbing was not significantly associated with actors' relationship quality on the same day.

Neither actors' nor partners' average perceived phubbing was significantly associated with actors' relationship quality two months later. Thus, when people report more phubbing by their partner, they experience lower relationship quality on the same day, but these effects do not last long-term.

Actors' attachment anxiety was a significant moderator between actors' perception of their partners' phubbing and actors' relationship quality two months later ($B = -0.30, p = .022$; see Figure 2). The results showed that when the actor was low in attachment anxiety, the association between actor's average perception of their partner's phubbing and actor's relationship quality two months later was negative ($B = -0.66, SE = .23, p = .005$). In other words, less anxious individuals experienced lower relationship quality two months later when they perceived their partner as phubbing them more during the diary period. In contrast, the results showed that when the actor was high in attachment anxiety, the association between actor's average perception of their partner's phubbing and actor's relationship quality two months later was non-significant ($B = 0.11, SE = .22, p = .635$). In other words, individuals high in attachment anxiety experienced the same level of relationship quality two months later regardless of whether they perceived their partner as phubbing them more or less during the diary period.

Actors' attachment avoidance was a significant moderator between partners' perception of the actors' phubbing and actors' relationship quality two months later ($B = -0.51, p = .016$; see Figure 3). The results showed that when an actor was low in attachment avoidance, the association between actor's average perception of their partner's phubbing and actor's relationship quality two months later was positive ($B = 0.67, SE = .25, p = .009$). In other words, less avoidant individuals experienced higher relationship quality two months later when their

partners perceived the actor as phubbing them more during the diary period. In contrast, the results showed that when an actor was high in attachment avoidance, the association between partner's average perception of the actor's phubbing and actor's relationship quality two months later was not significant ($B = -0.26$, $SE = .24$, $p = .294$).

None of the other main or moderator effects of attachment styles were significant for perceived phubbing.

3.2 Enacted Phubbing

The full results for enacted phubbing can be found in Table 4 for daily relationship quality and in Table 5 for relationship quality two months later. Neither actor's nor partner's report of their own phubbing were significantly associated with actor's relationship quality the same day or two months later. In other words, one's own phubbing nor being phubbed by one's partner was associated with their own relationship quality.

Actor's attachment anxiety was a significant moderator between an actor's report of their own average phubbing and the actor's relationship quality two months later ($B = 0.28$, $p = .021$; see Figure 4). The results showed that when the actor was low in attachment anxiety, the association between the actor's own report of their phubbing and their relationship quality two months later was negative ($B = -0.51$, $SE = .21$, $p = .018$). In other words, less anxious individuals experienced lower relationship quality two months later when they reported phubbing their partner more. In contrast, the results showed that when an actor was high in attachment anxiety, the association between their own report of their phubbing and their relationship quality two months later was not significant ($B = 0.22$, $SE = .24$, $p = .363$).

Finally, partner's attachment avoidance was a significant moderator between partner's report of their own daily phubbing and actor's daily relationship quality on the same day ($B =$

0.10, $p = .001$; see Figure 5). The results showed that when a partner was low in attachment avoidance, the association between partner's daily enacted phubbing and actor's daily relationship quality was negative ($B = -0.09$, $SE = .04$, $p = .027$). In other words, partners of less avoidant individuals experienced lower daily relationship quality when their partners reported more daily phubbing. In contrast, the results showed that when a partner was high in attachment avoidance, the association between partner's daily enacted phubbing and actor's daily relationship quality was positive ($B = 0.09$, $SE = .04$, $p = .016$). Thus, partners of highly avoidant individuals reported higher daily relationship quality when their partner reported phubbing more.

None of the other main or moderator effects of attachment styles were significant for enacted phubbing¹.

4. Discussion

4.1 How are partners' reports of their perceived phubbing behavior related to relationship quality immediately and over time?

We found that actors who perceived their partners as phubbing them on a given day also reported lower romantic relationship quality on the same day, providing support for Hypothesis 1. Our work with couples is consistent with past work that used samples of individuals in relationships (e.g., Thomas et al., 2022). Actors' reports of daily perceived phubbing across the diary did not have long-lasting effects; they were not associated with relationship quality two months later, contrary to Hypothesis 2. Our longitudinal results are in contrast to those of Booth

¹ We also examined potential effects of gender in the association between attachment styles (attachment avoidance and anxiety) and phubbing (perceived and enacted) given some of the previous findings have been gender specific. However, only 2/32 interactions were statistically significant: Women higher in attachment avoidance reported significantly less enacted phubbing compared to women lower in attachment avoidance ($B = -0.10$, $SE = 0.04$, $p = .023$). This association was not significant for men ($B = 0.05$, $SE = 0.05$, $p = .281$). Men reported phubbing their partners less when their women partners were higher in attachment avoidance compared to when their women partners were lower in attachment avoidance ($B = -0.10$, $SE = 0.05$, $p = .030$). This association was not significant for women ($B = 0.04$, $SE = 0.05$, $p = .434$).

et al. (2021) conducted with US married couples across one year, and with Chen et al. (2022) conducted with Chinese married couples across 3 months. Differences in samples, methods, and length of time between measures may account for these differences. In their studies the researchers assessed phubbing on one day, whereas our reports of phubbing were averaged across the diary period, which arguably could be more reliable. In addition, Booth et al.'s work assessed technoferece and included items on phones, tablets and tv, whereas ours focused on phones only. Finally, Chen et al. assessed relationship quality as the average of the two couple members, whereas we focused on both actors' and partners' reports of relationship quality separately. Future work should further examine the effects of perceived phubbing longitudinally in dyads in different countries to help us to understand the longer-term effects of perceived phubbing.

4.2 How are partners' reports of their own phubbing behavior (enacted phubbing) related to relationship quality immediately and over time?

Results for one's own enacted daily phubbing behavior differed from those for daily perceived phubbing. Actors' and partners' daily reports of their own enacted phubbing did not predict daily relationship quality (disconfirming Hypothesis 3). Similarly, average reports of enacted phubbing behavior did not predict relationship quality two months later (disconfirming Hypothesis 4). Interestingly, the extent to which one's partner perceives one has phubbed them did not influence actors' relationship quality daily or two months later, consistent with findings for enacted phubbing behavior. To our knowledge this is the first dyadic data that examines how people's reports about phubbing their partner is associated with one's own relationship quality. Our unique dataset also allowed us to compare the effects of perceived versus enacted phubbing in the same couple sample. Together, our results suggest that perceived rather than enacted

phubbing are paramount when determining relationship quality. Given the importance of perceived phubbing, research should further investigate the psychological mechanisms that may account for this effect, such as feeling neglected, excluded, disrespected, usurped, or unvalued.

4.3 How do individual differences in attachment anxiety and avoidance relate to partners' phubbing behavior and relationship quality?

In the present study we examined partners' adult attachment orientations and aimed to examine the extent to which perceived or enacted phubbing mediated the links between insecure attachment (anxious or avoidant) and relationship functioning. Surprisingly, attachment was not associated with perceived phubbing, and therefore we did not test for these mediation effects (Hypothesis 5). This contrasts with past research (e.g., Broning & Wartberg, 2022; McDaniel et al., 2018; Roberts & David, 2022) that found that attachment anxiety was positively associated with perceived phubbing. Our results regarding the link between attachment anxiety and perceived phubbing may have differed from past work due to differences in samples. Broning and Wartberg (2022) focused on mid-adult couple members who had been together for at least 10 years (average relationship duration = 22 yrs; average age was 46-49 years) in Germany, McDaniel et al. (2018) focused on mid-adult couples with children in the USA (95% married, average age 32-33), and Roberts and David (2022) focused on US married couples (average relationship duration = 17.5 years, average age was 43), whereas our sample comprised British couples who were primarily in established committed relationships (85% dating), whose relationship length average was 2.8 years and average age was 24. Perhaps attachment anxiety has a more powerful effect in adults of older age, lengthier relationships, or in the context of marriage. Research suggests (e.g., Chopik et al., 2013) that attachment anxiety decreases with age and samples of couples typically have members who are more secure. In addition,

attachment anxiety tends to be higher in newer relationships (Eastwood & Finkel, 2008). This suggests that if one is high in attachment anxiety in the context of mid-to-older adulthood or longer-term relationships, it might be a stronger determinant of partner perceptions of phubbing than in the context of committed dating, but comparatively shorter-term, relationships.

However, our results are consistent with McDaniel et al. (2018) who found that avoidance was unrelated to perceived phubbing. Broning and Wartberg (2022) found that the effect of avoidance on perceived phubbing differed for men and women; highly avoidant men report more perceived partner phubbing, whereas highly avoidant women report less perceived partner phubbing. In contrast to Broning and Wartberg, we did not find any significant differences between men and women in perceived phubbing (see Footnote 1).

In addition, our results might be different from past work because we assessed phubbing at the daily level, whereas most attachment and phubbing research is cross-sectional. Perhaps attachment styles influence the global perceptions of attentiveness in a relationship (including phubbing) but are less likely to distort partners' day-to-day perceptions of phubbing. At the daily level it may be easier to remember whether someone has phubbed you or not and, therefore there may be less bias with daily versus global reports. This is consistent with past work on attachment and relationship evaluations showing that participants who were high in attachment anxiety recalled their relationship quality to be lower than when reporting on it weekly, demonstrating their biased memory (Chang & Overall, 2022). Future research might focus on judgments regarding whether partners intended to phub one another and how these judgments impact relationship quality. Those high in attachment anxiety may inflate their perceptions of intentional partner phubbing.

Additionally, we found that attachment dimensions (when entered together as predictors) did not predict daily enacted phubbing. In other words, participants were not more or less likely to phub partners of a given attachment style, and partners of a given attachment style were not more likely to report that they engaged in phubbing behavior. These are novel results. Future research should focus on motivations for phubbing behavior and whether they differ for people of different attachment styles. For example, those high in attachment avoidance might phub their partner in order to avoid intimate conversations, whereas those high in attachment anxiety might phub their partner in order to garner attention and care from others online. This would be consistent with past work that examines the approach and avoidance motivations of people with differing attachment styles (e.g., Dewitte et al., 2008).

Our final aim was to examine whether adult attachment orientation moderated the effects of phubbing on relationship quality. We found a few moderation effects, but most were not consistent with expectations (Hypothesis 6) based on attachment theory or past relevant research (David & Roberts, 2021; Roberts & David, 2016). This past research focused on different outcomes (i.e., jealousy and cell phone conflict) and samples (conducted with adults from the USA, with older participants, and the inclusion of some people reporting on their past romantic partner). Another consideration is that our unexpected moderation results may have been spurious due to low statistical power (Lane & Hennes, 2018). Given samples of couples tend to be relatively secure (Chopik et al., 2013), future studies might try to capture more insecurity when recruiting. Future work with larger, varied, and more highly powered samples should further investigate the potential moderating effects of partner phubbing on relationship functioning.

4.4 Future Directions

Future research should examine what characteristics of the phubbee and phubber, and what features of the phubbing situation lead the phubbee to perceive more or less partner phubbing. For example, are couples who have similar phone use habits less likely to view their partner's phone use as phubbing? Are younger people less likely to perceive their partners' phone use as phubbing than older people because they spend more time on their phones or have different norms about phone use (Kuss et al., 2018)?

Research shows that partners can retaliate for being phubbed by picking up their phones in order to get revenge, seek support from others, and obtain approval from others (Thomas et al., 2022). Retaliation can lead to a downward spiral leading to less attention, responsiveness, and intimacy between partners and consequently lower relationship quality (Beukeboom & Pollman, 2021). Consistent with this notion, research (Chen et al., 2022) shows that wives who perceived their husbands to be high in phubbing were more likely to have husbands who perceived their wives were high in phubbing 3 months later (although husbands' perceived phubbing did not longitudinally predict wives' perceived phubbing). This provides partial evidence for a transmission of phubbing; future work on transmission should directly assess enacted phubbing behaviors. In contrast, past research (Kelly et al., 2017; Miller-Ott & Kelly, 2015) suggests that shared phone use can be enjoyable and a positive experience. Helping to create ground-rules for smartphone use during couple interactions may be a starting point for improving relationship functioning.

Our work cannot speak to issues of causality. While examining within-person effects can control for many potential time-invariant third variables (e.g., gender, ethnicity, personality), it is not sufficient alone for making causal inferences from longitudinal data (Rohrer & Murayama, 2023). Experiments still represent the gold standard of making causal conclusions. Future

research should experimentally manipulate phubbing in dyadic interactions to examine immediate and potential longer-term effects of partner phubbing on relationship functioning for both couple members. For example, researchers could observe couple interactions after one couple member has been instructed to look at one's phone (or not) during a discussion or joint task. Investigating the causal effects of phubbing behavior (and its mediators) on close relationship functioning in different types of samples will be an important next step.

It is important to note that phubbing is a behavior that takes place in an interaction between partners. A weakness of the current literature is that most research examines self-reports or imagined interactions, rather than actual partner interactions (Al-Saggaf, 2022). Although not focusing specifically on partner interactions, research by Vanden Abeele et al. (2019) observed students' interactions at a campus restaurant and found that students used their phones during 60% of the conversations for about 25% of the 10-minute interval observed. Future work should assess partner phone-use behaviors in different contexts to determine whether this fits with self-reported phone-use and its consequences.

4.5 Strengths and Limitations

The study had several strengths that differentiated it from previous research and enabled us to examine several novel research questions. We collected data from couples and asked participants about both perceived and enacted phubbing behaviors which highlighted differences in the association between phubbing and relationship satisfaction for perceptions and actual enacted behaviors. Participants in the study also completed a 14-day daily diary which allowed us to examine daily associations which may provide a more realistic view of actual phubbing behaviors in these relationships. Finally, we also included a follow-up two months later allowing us to examine potential longer-term associations of phubbing on relationship quality and showed

that, at least when examined on a daily level, phubbing behaviors are transient and are not associated with longer-term negative relationship outcomes.

However, there are also several limitations and considerations that should be taken into account when evaluating the results and comparing the results against previous studies. First, the sample size, while not unusual for longitudinal dyadic daily diary studies, was still relatively small and thus there may have been small daily effects of phubbing on relationship quality that we were unable to capture but that may have cumulative effects on relationship quality over time. Second, we only asked participants about daily phubbing and did not ask participants about their global perceptions or enacted behaviors of phubbing. It is possible, for example, that attachment styles distort one's overall perceptions of phubbing behaviors but do not influence actual phubbing behaviors or daily reports of perceived phubbing because it is easier to remember daily events accurately than events in the preceding weeks or months. This may explain why we found no associations between attachment styles and phubbing in contrast to previous research (e.g., Broning & Wartberg, 2022; Roberts & David, 2022); research suggests that insecurely attached individuals have a distorted view of their own or their partner's behaviors on a global level but are able to perceive daily events accurately (Chang & Overall, 2022). Because we did not ask about global perceived phubbing, we cannot directly compare our results with other studies and cannot establish whether attachment insecurity indeed distorts one's perceptions of global phubbing but not daily phubbing or whether our sample is somehow unique. Future research should compare the associations between attachment styles and global and daily reports of phubbing to examine this possibility. Third, although we attempted to reduce bias by asking partners to complete all surveys separately and to not discuss the study until after all phases were complete (a typical practice for dyadic studies with this design), we could not

control this. We acknowledge this as a potential limitation. Finally, we did not assess whether the participants spent time together every day, which is a potential limitation that might be addressed in future research.

4.6 Concluding Remarks

In a dyadic diary dataset, we found that daily perceived phubbing was associated with lower relationship quality, however these negative effects of perceived phubbing did not hold two months later. Importantly, we also examined daily enacted phubbing and found that actors' and partners' enacted phubbing were unrelated to relationship quality both daily and two months later. Together these results suggest that perceptions about partner's phubbing are more important than partners' actual phubbing behavior. Interventions should target phubbing perceptions in order to improve relationship functioning.

References

- Ackerman, R. A., Ledermann, T., & Kenny, D. A. (2016). Power analysis for the actor-partner interdependence model. Unpublished manuscript. <https://robert-a-ackerman.shinyapps.io/apimpower/>
- Al-Saggaf, Y. (2022). *The psychology of phubbing*. Springer Nature.
<https://doi.org/10.1007/978-981-19-7045-0>
- Beukeboom, C., & Pollmann, M. (2021). Partner phubbing: Why using your phone during interactions with your partner can be detrimental for your relationship. *Computers in Human Behavior*, *124*, 106932. <https://doi.org/10.1016/j.chb.2021.106932>
- Broning, S., & Wartberg, L. (2022). Attached to your smartphone? A dyadic perspective on perceived partner phubbing and attachment in long-term couple relationships. *Computers in Human Behavior* (126). <https://doi.org/10.1016/j.chb.2021.106996>
- Carnelley, K. B., Pietromonaco, P. R., & Jaffe, K. (1996). Attachment, caregiving, and relationship functioning in couples: Effects of self and partner. *Personal Relationships*, *3*, 257-277.
- Chang, V. T., & Overall, N. C. (2022). Attachment anxiety, tracking accuracy, and biased memory of prior relationship evaluations. *Personal Relationships*, *29*(2), 259-411.
<https://doi.org/10.1111/per.12417>
- Chen, Z., Gong, Y., & Xie, J. (2022). From phubee to phubber: The transmission of phone snubbing behavior between marital partners. *Information Technology and People*, *35*(4), 1493-1510. DOI 10.1108/ITP-03-2020-0150.
- Chopik, W.J., Edelstein, R.S., & Fraley, R.C. (2013). Attachment from early to older adulthood.

- Journal of Personality*, 81(2), 171-183. <https://doi.org/10.1111/j.1467-6494.2012.00793.x>
- Courtright, J., & Caplan, S. (2020). A meta-analysis of mobile phone use and presence. *Human Communication and Technology*, 1(2), 20–35. <https://doi.org/10.17161/hct.v1i2.13412>
- David, M. E., & Roberts, J. A. (2021). Investigating the impact of partner phubbing on romantic jealousy and relationship satisfaction: The moderating role of attachment anxiety. *Journal of Social and Personal Relationships*, 38(12) 3590–3609. <https://doi.org/10.1177/0265407521996454>
- Dewitte, M., De Houwer, J., Buysse, A., & Koster, E. H. W. (2008). Proximity seeking in adult attachment: Examining the role of automatic approach–avoidance tendencies. *British Journal of Social Psychology*, 47, 557–573. <https://bpspsychub.onlinelibrary.wiley.com/doi/pdf/10.1348/014466607X265148>
- Eastwick, P. W., & Finkel, E. J. (2008). The attachment system in fledgling relationships: An activating role for attachment anxiety. *Journal of Personality and Social Psychology*, 95(3), 628–647. <https://doi.org/10.1037/0022-3514.95.3.628>
- Fletcher, G., Simpson, J., & Thomas, G. (2000). The measurement of perceived relationship quality components: A confirmatory factor analytic approach. *Personality and Social Psychology Bulletin*, 26(3), 340-354. <https://doi.org/10.1177/0146167200265007>
- Frackowiak, M., Hilpert, P., & Russell, P. S. (2022). Partner’s perception of phubbing is more relevant than the behavior itself: A daily diary study. *Computers in Human Behavior*, 134, 107323. <https://doi.org/10.1016/j.chb.2022.107323>
- Frackowiak, M., Hilpert, P., & Russell, P. S. (2023). Impact of partner phubbing on negative emotions: A daily diary study of mitigating factors. *Current Psychology*

- <https://doi.org/10.1007/s12144-023-04401-x>
- 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. <https://doi.org/10.1016/j.chb.2017.01.051>
- Hazan, C., & Shaver, P. (1987). Romantic love conceptualized as an attachment process. *Journal of Personality and Social Psychology, 52*, 511-524.
- Hipp, C. J., & Carlson, R. G. (2021). The dyadic association among technoference and relationship and sexual satisfaction of young adult couples. *Journal of Sex and Marital Therapy, 47*(5), 508-520. <https://doi.org/10.1080/0092623X.2021.1922562>
- Kelly, L., Miller-Ott, A. E., & Duran, R. L. (2017) Sports scores and intimate moments: An Expectancy Violations Theory approach to partner cell phone behaviors in adult romantic relationships, *Western Journal of Communication, 81*(5), 619-640. <https://doi.org/10.1080/10570314.2017.1299206>
- Kenny, D. A., Kashy, D. A., & Cook, W. L. (2006). *Dyadic data analysis*. New York, NY: Guilford Press.
- Kuss, D.J., Kanjo, E., Crook-Rumsey, M., Kibowski, F., Wang, G. Y., & Sumich, A. (2018) Problematic mobile phone use and addiction across generations: The roles of psychopathological symptoms and smartphone use. *Journal of Technology in Behavioral Sciences, 3*, 141–149. <https://doi.org/10.1007/s41347-017-0041-3>
- Lafontaine, M.-F., Brassard, A., Lussier, Y., Valois, P., Shaver, P. R., & Johnson, S. M. (2016). Selecting the best items for a Short-Form of the Experiences in Close Relationships Questionnaire. *European Journal of Psychological Assessment, 32*, 140-154. <http://dx.doi.org/10.1027/1015-5759/a000243>
- Lane, S. P., & Hennes, E. P. (2018). Power struggles: Estimating sample size for multilevel

- relationships research. *Journal of Social and Personal Relationships*, 35(1), 7-31.
<https://doi.org/10.1177/0265407517710342>
- Laurenceau, J. P., & Bolger, N. (2012). Analyzing diary and intensive longitudinal data from dyads. In M. R. Mehl & T. S. Conner (Eds.), *Handbook of research methods for studying daily life* (pp. 407–422). The Guilford Press.
- Li, D., Carnelley, K. B., & Rowe, A. C. (in press). Insecure attachment orientation in adults and children and negative attribution bias: A meta-analysis. *Personality and Social Psychology Bulletin*, <https://doi.org/10.1177/01461672221117690>
- McDaniel, B., & Coyne, S. (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(1), 85-98. <https://doi.org/10.1037/ppm0000065>
- McDaniel, B., Galovan, A., Cravens, J., & Drouin, M. (2018). “Technoference” and implications for mothers' and fathers' couple and coparenting relationship quality. *Computers in Human Behavior*, 80, 303-313. <https://doi.org/10.1016/j.chb.2017.11.019>
- McDaniel, B. T., Galovan, A. M., & Drouin, M. (2020). Daily technoference, technology use during couple leisure time, and relationship quality. *Media Psychology*, 24, 637-665.
<https://doi.org/10.1080/15213269.2020.1783561>
- McDaniel, B., & Drouin, M. (2019). Daily technology interruptions and emotional and relational well-being. *Computers in Human Behavior*, 99, 1-8.
<https://doi.org/10.1016/j.chb.2019.04.027>
- Miller-Ott, A. E., & Kelly, L. (2015). The presence of cell phones in romantic partner face-to-face interactions: An expectancy violation theory approach. *Southern Communication Journal*, 80, 253–270. doi:10.1080/1041794X.2015.1055371

- Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods*. Sage, Thousand Oaks, CA.
- Rempel, J. K., Holmes, J. G., & Zanna, M. P. (1985). Trust in close relationships. *Journal of Personality and Social Psychology*, *49*, 95–112.
<https://psycnet.apa.org/doi/10.1037/0022-3514.49.1.95>
- Roberts, J. A., & David, M. (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. <https://doi.org/10.1016/j.chb.2015.07.058>
- Roberts, J. A., & David, M. E. (2022). Partner phubbing as a social allergen: Support for a Dual Process Model. *Human Behavior and Emerging Technologies*, 6432445.
<https://doi.org/10.1155/2022/6432445>
- Rusbult, C. E., Martz, J. M., & Agnew, C. R. (1998). The investment model scale: Measuring commitment level, satisfaction level, quality of alternatives, and investment size. *Personal Relationships*, *5*(4), 357-387.
<https://doi.org/10.1111/j.1475-6811.1998.tb00177.x>
- Schneider, S., & Stone, A. A. (2016). Ambulatory and diary methods can facilitate the measurement of patient-reported outcomes. *Quality of Life Research*, *25*(3), 497–506.
<http://www.jstor.org/stable/44852369>
- Thomas, T. T., Carnelley, K. B., & Hart, C. M. (2022). Phubbing in romantic relationships and retaliation: A daily diary study. *Computers in Human Behavior*, *137*, 107398.
<https://doi.org/10.1016/j.chb.2022.107398>
- Vanden Abeele, M. (2020). The social consequences of phubbing: A framework and a research agenda. In R. Ling, L. Fortunati, G. Goggin, S. S. Lim, and Y. Li (eds.) *The Oxford*

Handbook of Mobile Communication and Society. Oxford Academic.

<https://doi.org/10.1093/oxfordhb/9780190864385.001.0001>

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.

<https://doi.org/10.1016/j.paid.2017.01.014>

Journal Pre-proof

PERCEIVED AND ENACTED PARTNER PHUBBING

1

Table 1*Means, Standard Deviations, and Correlations with Confidence Intervals*

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9
1. A attachment anxiety	3.88	1.29									
2. P attachment anxiety	3.88	1.29	.05*								
			[.01, .08]								
3. A attachment avoidance	2.27	0.90	-.02	.09**							
			[-.05, .02]	[.05, .13]							
4. P attachment avoidance	2.27	0.90	.09**	-.02	.15**						
			[.05, .13]	[-.05, .02]	[.11, .18]						
5. A enacted phubbing	1.60	0.70	-.00	-.03	-.01	-.04*					
			[-.04, .04]	[-.06, .01]	[-.05, .03]	[-.08, -.01]					
6. P enacted phubbing	1.60	0.70	-.03	-.00	-.04*	-.01	.30**				
			[-.06, .01]	[-.04, .04]	[-.08, -.01]	[-.05, .03]	[.27, .34]				
7. A perceived phubbing	1.60	0.76	.03	-.06**	.01	-.02	.69**	.35**			

PERCEIVED AND ENACTED PARTNER PHUBBING

2

			[-.01, .07]	[-.10, -.02]	[-.03, .05]	[-.06, .02]	[.67, .71]	[.31, .38]			
8. P perceived phubbing	1.60	0.76	-.06**	.03	-.02	.01	.35**	.69**	.24**		
			[-.10, -.02]	[-.01, .07]	[-.06, .02]	[-.03, .05]	[.31, .38]	[.67, .71]	[.20, .28]		
9. Daily relationship quality	6.45	0.92	.03	-.08**	-.29**	-.17**	-.00	-.00	-.05*	.02	
			[-.01, .07]	[-.12, -.04]	[-.33, -.25]	[-.21, -.14]	[-.04, .04]	[-.04, .04]	[-.09, -.01]	[-.02, .06]	
10. Relationship quality 2 months later	0.00	0.94	-.03	-.17**	-.37**	-.22**	-.04*	-.01	-.04	-.00	.54**
			[-.07, .01]	[-.21, -.13]	[-.40, -.33]	[-.26, -.19]	[-.09, -.00]	[-.05, .03]	[-.08, .00]	[-.04, .04]	[.51, .56]

Note. *M* and *SD* are used to represent mean and standard deviation, respectively. Values in square brackets indicate the 95% confidence interval for each correlation. The confidence interval is a plausible range of population correlations that could have caused the sample correlation. * indicates $p < .05$. ** indicates $p < .01$. A = actor, P = partner.

Table 2

The Results for Daily Perceived Phubbing and Daily Relationship Quality

<i>Predictors</i>	Relationship Quality					
	<i>Estimates</i>	<i>CI</i>	<i>p</i>	<i>Estimates</i>	<i>CI</i>	<i>p</i>
(Intercept)	6.43	6.08 – 6.78	<0.001	6.41	6.05 – 6.77	<0.001
Actor daily perceived phubbing	-0.06	-0.11 – -0.01	0.021	-0.06	-0.11 – -0.01	0.031
Partner daily perceived phubbing	0.02	-0.04 – 0.07	0.529	0.03	-0.03 – 0.09	0.286
Day	-0.00	-0.01 – 0.01	0.744	0.04	-0.03 – 0.11	0.235
Age	-0.00	-0.02 – 0.01	0.876	-0.03	-0.10 – 0.04	0.372
Gender	-0.05	-0.07 – -0.02	0.001	-0.24	-0.33 – -0.15	<0.001
Relationship length	0.02	-0.01 – 0.05	0.202	-0.14	-0.23 – -0.05	0.003
Actor anxiety				-0.00	-0.01 – 0.01	0.852
Partner anxiety				-0.00	-0.02 – 0.02	0.992
Actor avoidance				-0.02	-0.04 – 0.01	0.253
Partner avoidance				0.02	-0.01 – 0.05	0.248
A perceived phubbing * A anxiety				-0.01	-0.04 – 0.03	0.701
P perceived phubbing * A anxiety				-0.02	-0.06 – 0.01	0.205
A perceived phubbing * A avoidance				0.03	-0.02 – 0.09	0.243
P perceived phubbing * A avoidance				-0.02	-0.07 – 0.04	0.533
A perceived phubbing * P anxiety				-0.02	-0.05 – 0.02	0.394
P perceived phubbing * P anxiety				-0.02	-0.05 – 0.02	0.441
A perceived phubbing * P avoidance				0.01	-0.05 – 0.06	0.811
P perceived phubbing * P avoidance				0.03	-0.03 – 0.09	0.284
Random Effects						
σ^2	0.34			0.34		
τ_{00}	0.39	CoupleID		0.37	CoupleID	
τ_{11}	0.01	CoupleID.cwa_parphub		0.01	CoupleID.cwa_parphub	
	0.03	CoupleID.cwp_parphub		0.03	CoupleID.cwp_parphub	
	0.00	CoupleID.Day		0.00	CoupleID.Day	

ρ_{01}	0.25	0.24
	-0.52	-0.66
	-0.14	-0.30
ICC	0.58	0.53
N	99 CoupleID	97 CoupleID
Observations	2384	2336
Marginal R ² / Conditional R ²	0.014 / 0.584	0.104 / 0.581

Journal Pre-proof

Table 3*The Results for Average Perceived Phubbing and Relationship Quality Two Months Later*

<i>Predictors</i>	Relationship Quality Two Months Later					
	<i>Estimates</i>	<i>CI</i>	<i>p</i>	<i>Estimates</i>	<i>CI</i>	<i>p</i>
Intercept	0.26	-0.61 – 1.14	0.552	-0.13	-0.99 – 0.74	0.774
Actor average perceived phubbing	-0.21	-0.50 – 0.08	0.166	-0.28	-0.58 – 0.02	0.068
Partner average perceived phubbing	0.06	-0.23 – 0.36	0.67	0.21	-0.09 – 0.51	0.182
Age	-0.02	-0.06 – 0.02	0.385	-0.11	-0.21 – 0.00	0.057
Gender	-0.09	-0.21 – 0.03	0.146	-0.39	-0.55 – -0.22	<0.001
Relationship length	0.05	-0.01 – 0.11	0.092	-0.2	-0.36 – -0.04	0.014
Actor anxiety				0	-0.04 – 0.04	0.915
Partner anxiety				-0.04	-0.17 – 0.09	0.546
Actor avoidance				0.04	-0.02 – 0.09	0.218
Partner avoidance				0.03	-0.08 – 0.13	0.637
A perceived phubbing * A anxiety				0.3	0.05 – 0.55	0.022
P perceived phubbing * A anxiety				0.01	-0.24 – 0.27	0.92
A perceived phubbing * A avoidance				0.39	-0.07 – 0.85	0.099
P perceived phubbing * A avoidance				-0.51	-0.93 – -0.10	0.016
A perceived phubbing * P anxiety				-0.22	-0.48 – 0.05	0.107
P perceived phubbing * P anxiety				0.24	-0.00 – 0.48	0.055
A perceived phubbing * P avoidance				-0.19	-0.63 – 0.25	0.398
P perceived phubbing * P avoidance				0.25	-0.20 – 0.69	0.277
Observations	171			167		
R ²	0.043			0.281		

Table 4

The Results for Daily Enacted Phubbing and Daily Relationship Quality

<i>Predictors</i>	Relationship Quality					
	<i>Estimates</i>	<i>CI</i>	<i>p</i>	<i>Estimates</i>	<i>CI</i>	<i>p</i>
(Intercept)	6.46	6.11 – 6.82	< 0.001	6.44	6.07 – 6.80	< 0.001
Actor daily phubbing	-0.01	-0.06 – 0.04	0.789	-0.01	-0.06 – 0.05	0.835
Partner daily phubbing	-0.00	-0.06 – 0.05	0.863	0.00	-0.05 – 0.06	0.889
Day	-0.00	-0.01 – 0.01	0.795	0.04	-0.03 – 0.10	0.267
Age	-0.00	-0.02 – 0.01	0.687	-0.03	-0.10 – 0.03	0.340
Gender	-0.05	-0.07 – -0.02	0.001	-0.24	-0.33 – -0.15	< 0.001
Relationship length	0.03	-0.01 – 0.06	0.130	-0.14	-0.23 – -0.05	0.002
Actor anxiety				-0.00	-0.01 – 0.01	0.902
Partner anxiety				-0.00	-0.02 – 0.01	0.814
Actor avoidance				-0.02	-0.04 – 0.01	0.239
Partner avoidance				0.02	-0.01 – 0.05	0.147
A phubbing * A anxiety				0.01	-0.02 – 0.05	0.495
P phubbing * A anxiety				-0.02	-0.05 – 0.02	0.445
A phubbing * A avoidance				0.05	-0.01 – 0.10	0.102
P phubbing * A avoidance				-0.03	-0.10 – 0.03	0.270
A phubbing * P anxiety				0.01	-0.03 – 0.04	0.715
P phubbing * P anxiety				-0.01	-0.05 – 0.03	0.708
A phubbing * P avoidance				-0.05	-0.11 – 0.01	0.096
P phubbing * P avoidance				0.10	0.04 – 0.16	0.001
Random Effects						
σ^2	0.36			0.36		
τ_{00}	0.40	CoupleID		0.37	CoupleID	
τ_{11}	0.01	CoupleID.cwa_myphub		0.01	CoupleID.cwa_myphub	
	0.01	CoupleID.cwp_myphub		0.02	CoupleID.cwp_myphub	
	0.00	CoupleID.Day		0.00	CoupleID.Day	

ρ_{01}	-0.06	-0.28
	-0.75	-0.81
	-0.17	-0.30
ICC	0.56	0.52
N	99 _{CoupleID}	97 _{CoupleID}
Observations	2386	2338
Marginal R ² / Conditional R ²	0.015 / 0.570	0.108 / 0.573

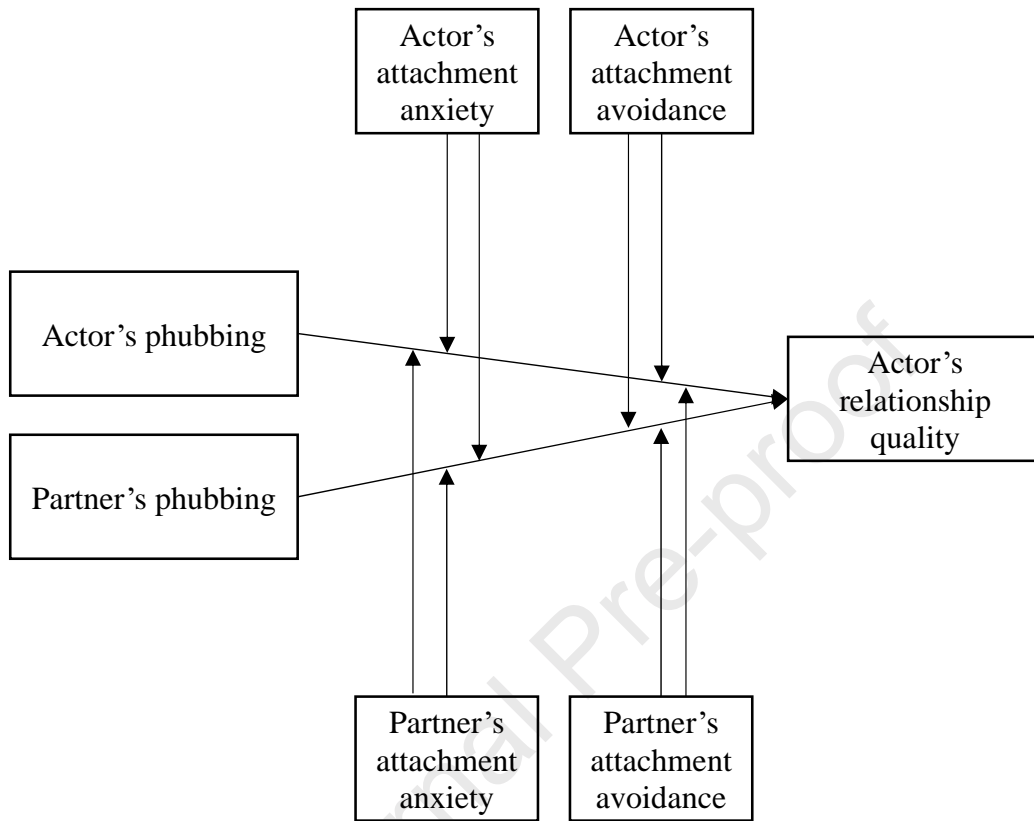
Journal Pre-proof

Table 5

The Results for Average Enacted Phubbing and Relationship Quality Two Months Later

<i>Predictors</i>	Relationship Quality two months Later					
	<i>Estimates</i>	<i>CI</i>	<i>p</i>	<i>Estimates</i>	<i>CI</i>	<i>p</i>
Intercept	0.27	-0.60 – 1.14	0.544	-0.11	-1.01 – 0.78	0.803
Actor average phubbing	-0.19	-0.51 – 0.12	0.234	-0.14	-0.46 – 0.18	0.383
Partner average phubbing	0.06	-0.26 – 0.38	0.715	0.1	-0.23 – 0.44	0.537
Age	-0.02	-0.06 – 0.02	0.386	-0.1	-0.21 – 0.01	0.065
Gender	-0.09	-0.21 – 0.03	0.16	-0.38	-0.55 – -0.22	<0.001
Relationship length	0.05	-0.01 – 0.11	0.093	-0.16	-0.31 – -0.00	0.051
Actor anxiety				0	-0.04 – 0.04	0.991
Partner anxiety				-0.03	-0.16 – 0.09	0.618
Actor avoidance				0.03	-0.03 – 0.09	0.388
Partner avoidance				0	-0.11 – 0.11	1
A phubbing * A anxiety				0.28	0.05 – 0.52	0.021
P phubbing * A anxiety				-0.05	-0.33 – 0.22	0.694
A phubbing * A avoidance				0.1	-0.33 – 0.53	0.637
P phubbing * A avoidance				-0.31	-0.73 – 0.11	0.146
A phubbing * P anxiety				-0.14	-0.42 – 0.14	0.326
P phubbing * P anxiety				0.08	-0.16 – 0.32	0.517
A phubbing * P avoidance				0.06	-0.36 – 0.49	0.765
P phubbing * P avoidance				0.13	-0.32 – 0.59	0.572
Observations	171			167		
R ²	0.046			0.246		

Figure 1
Theoretical Model



Note. The graphical illustration shows the theoretical model for the analyses. In the model, actor and partner phubbing are used to predict relationship satisfaction. Both partners' attachment anxiety and attachment avoidance serve as moderators. We have only provided one version of the theoretical model but there are four versions of this model which include either daily (within-person effects) or average (between-person effects) versions of the predictor variables, relationship satisfaction on the same day or two months later, as well as either perceived or enacted phubbing.

Figure 2

The Moderation by Actor's Attachment Anxiety on Actor's Average Perceived Phubbing and Actor's Relationship Quality Two Months Later

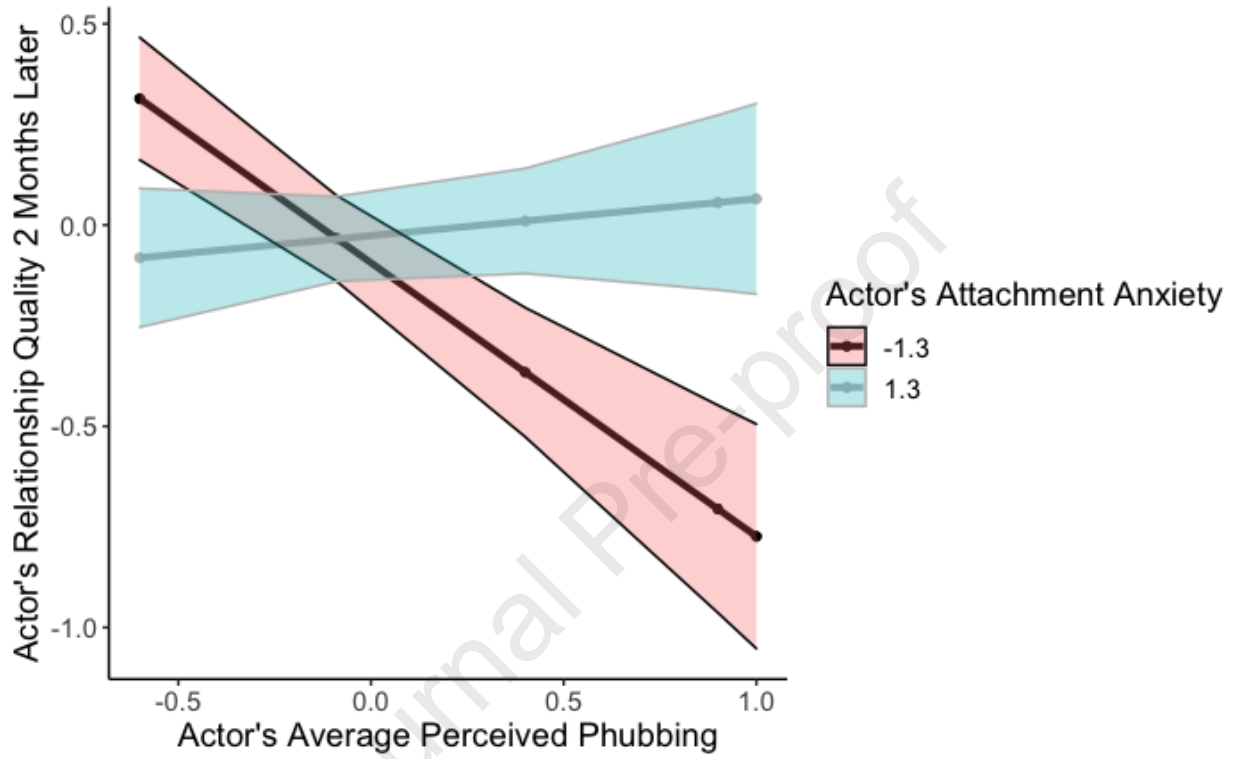


Figure 3

The Moderation by Actor's Attachment Avoidance on Partner's Average Perceived Phubbing and Actor's Relationship Quality Two Months Later

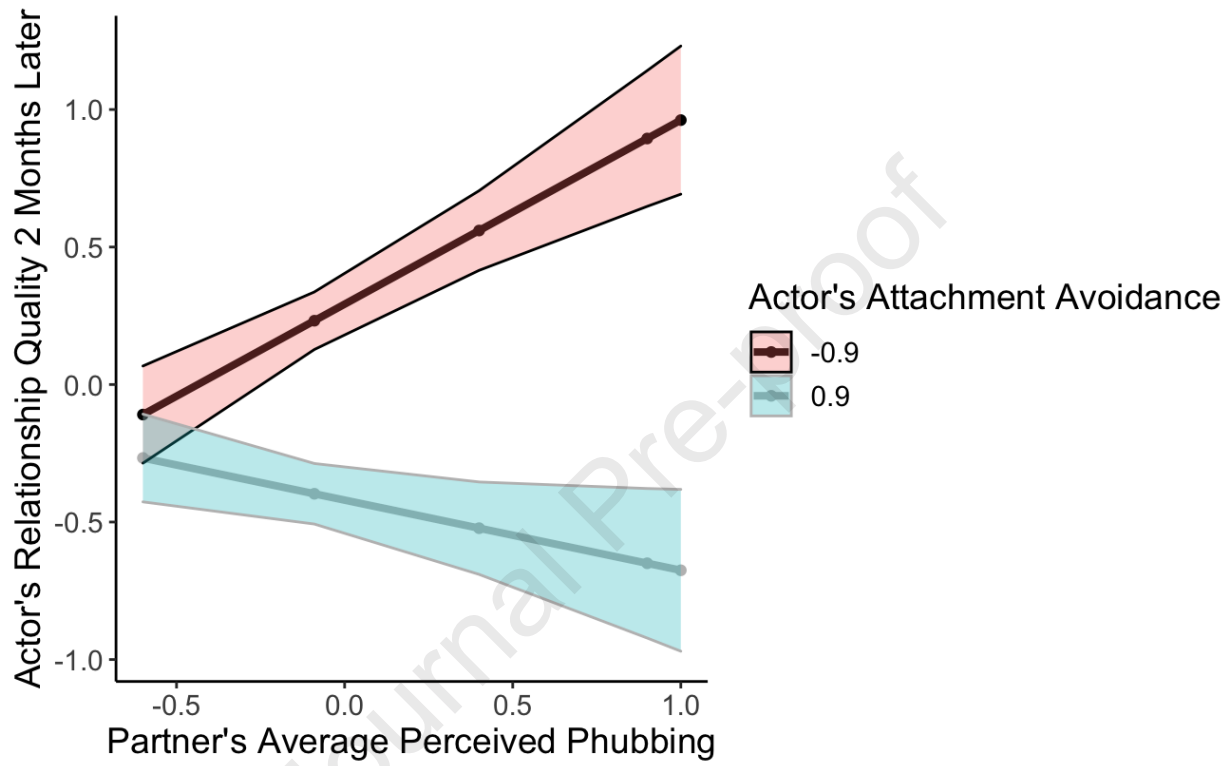


Figure 4

The Moderation by Actor's Attachment Anxiety on Actor's Average Enacted Phubbing and Actor's Relationship Quality Two Months Later

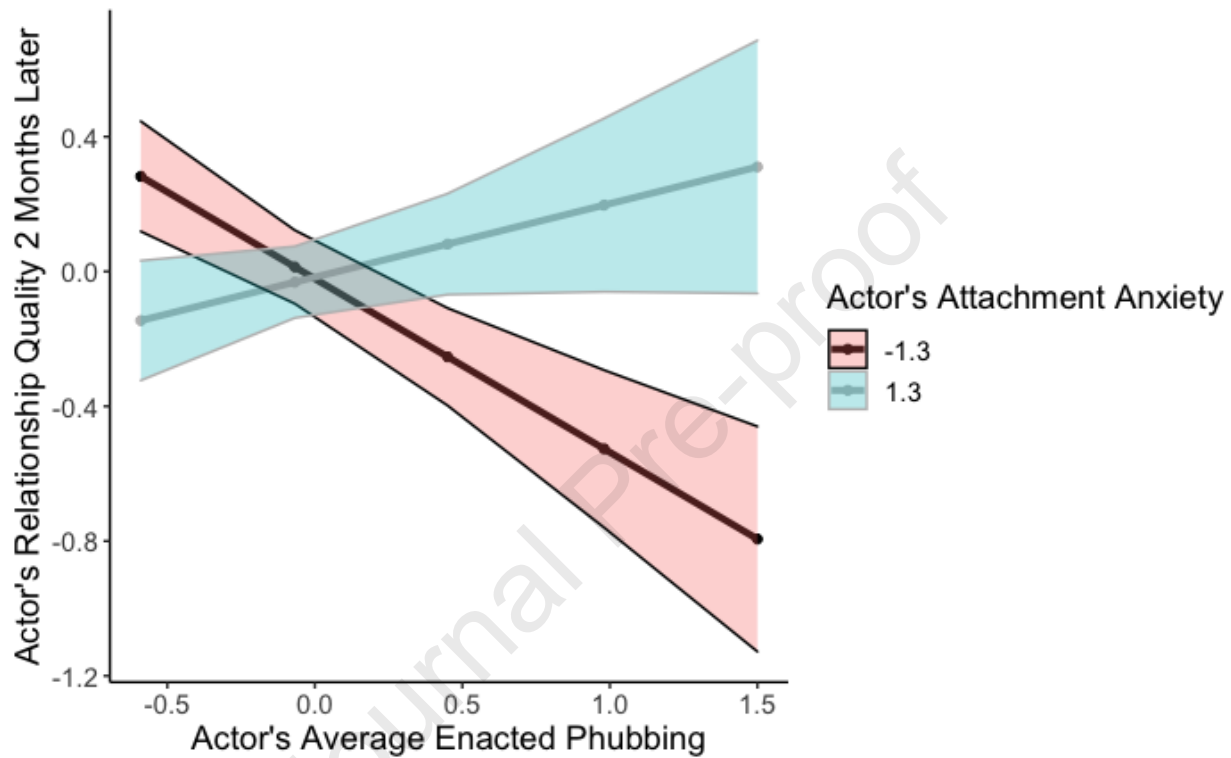
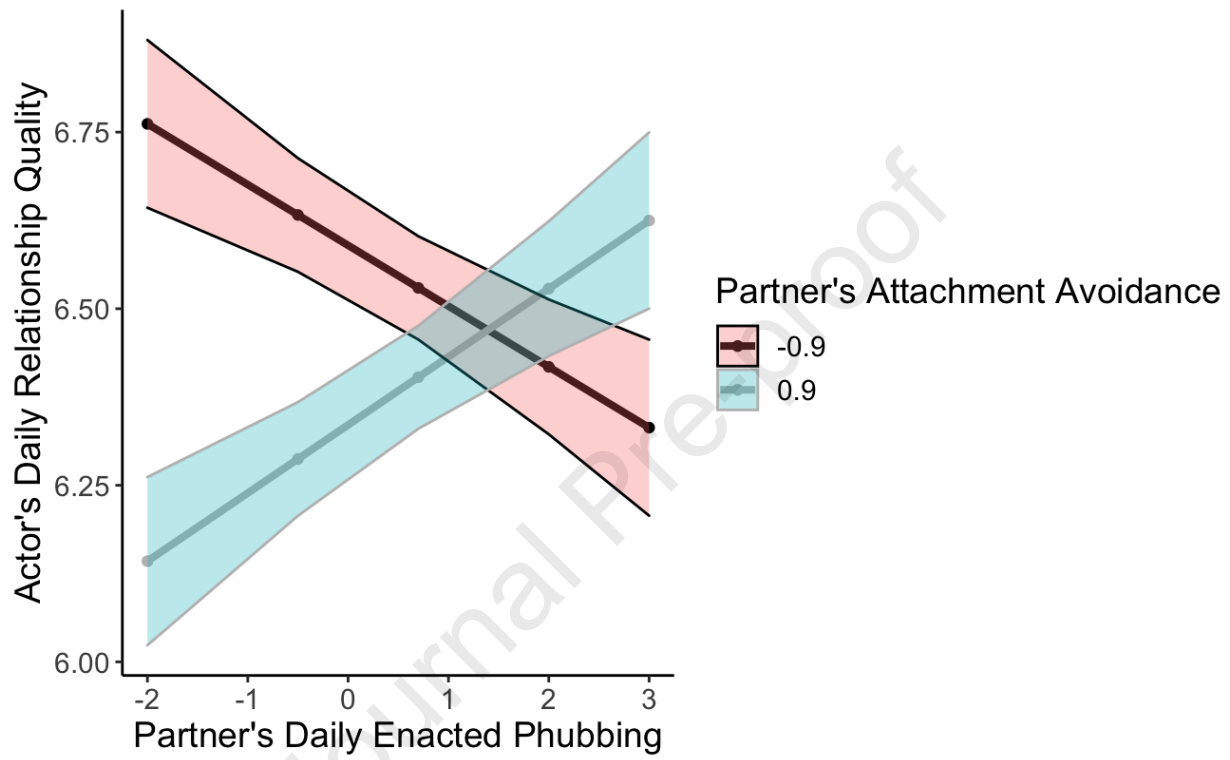


Figure 5

The Moderation by Partner's Attachment Avoidance on Partner's Daily Enacted Phubbing and Actor's Daily Relationship Quality



Acknowledgements

The authors gratefully acknowledge the Diverse Romantic Relationships and Well-Being I (DRRAW I) team for their assistance with data collection.

Journal Pre-proof

Conflict of Interest

The authors declare no conflicts of interest.

Journal Pre-proof