Cell Phone Presence, Phubbing, and Rejection: Antecedents and Effects of Cell Phone Usage During Face-to-face Communication

Ryan Allred
University of Connecticut - Storrs, ryan.allred@uconn.edu

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Ryan J. Allred, PhD
University of Connecticut, 2020

Abstract

The introduction of cell phone technology continues to influence relational communication. Pilot testing sought to understand if the mere presence of a phone causes individuals to feel snubbed by their conversation partners, but failed to find a direct effect of cell phone presence on any key communication outcome. Therefore, the present two-part study explored the impact of cell phone usage (i.e., phubbing), rather than presence alone, during face-to-face communication. Utilizing interpersonal acceptance-rejection theory, study one examined the impact of phubbing on perceptions of acceptance and rejection within parent-child relationships. Then, drawing upon developmental interactionist theory, study two examined the influence of phubbing on immediacy (i.e., nonverbal signaling which indicates psychological availability), and relationship satisfaction depending upon rejection sensitivity and affect receiving ability within adult romantic relationships. Findings suggest that parental phubbing indirectly reduces remembrances of parental acceptance. In turn parental acceptance was connected to decreased reports of rejection sensitivity, but only in father/son relationships. Both rejection sensitivity and parental phone usage predicted phone addiction and phubbing among adult children. Rejection sensitivity was also positively associated with reports of phubbing among romantic partners. Satisfaction with partner phone usage fully mediated the negative association between partner phubbing and relationship satisfaction, and immediacy partially mediated the positive association between satisfaction with partner phone usage and relationship
satisfaction. Affect receiving ability was positively associated with levels of satisfaction with partner phone usage. Together, findings highlight the negative effects of cell phone usage during face-to-face communication.

Key words: phubbing, cell phone, immediacy, rejection sensitivity, empathy
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Ryan J. Allred

B.S., Utah State University, 2014
M.A., Colorado State University, 2016

A Dissertation
Submitted in Partial Fulfillment of theRequirements for the Degree ofDoctor of Philosophyat theUniversity of Connecticut

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2020
Doctor of Philosophy Dissertation

Cell Phone Presence, Phubbing, and Rejection: Antecedents and Effects of Cell Phone Usage During Face-to-face Communication

Presented by
Ryan J. Allred, B.S., M.A.

Major Advisor

______________________________
Ross W. Buck, PhD

Associate Advisor

______________________________
Amanda Denes, PhD

Associate Advisor

______________________________
John Christensen, PhD

Associate Advisor

______________________________
Ronald P. Rohner, PhD

University of Connecticut

2020
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The decision to move to Connecticut was not an easy one for me. In fact, out of all of the offers I had received, UConn was not even in my top three. But something about the brief visit I made in 2016 convinced me that this was where I needed to be. I remember Dr. Christensen demonstrating some of the department’s new technology, but what really impressed me was his kindness and excitement for learning. Later, I sensed a strong feeling of support during my meetings with Dr. Buck and Dr. Denes. I felt that they would not only offer the guidance I needed, but do so in a way that allowed me to freely explore my own interests. It was ultimately meeting the people of the department that convinced me that I would do well at UConn. All of the faculty I worked with at UConn taught me more about what it means to provide support.

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Throughout this journey, I have also been lucky enough to receive constant support from my family. My parents, and my 11 siblings (including in-laws), have provided a base from which I have felt comfortable to push my boundaries. I always knew, even if I failed, that I had a place with them. This gave me the confidence I needed to challenge myself and step out into new experiences – choosing the harder right, rather than the easier wrong.
# TABLE OF CONTENTS

Introduction ......................................................................................................................... 1

Pilot Testing
  Literature Review ........................................................................................................ 4
  The “Mere Presence” Hypothesis .............................................................................. 4
  Nonverbal Immediacy ............................................................................................... 6
  Affect Receiving Ability ............................................................................................ 9
  Methods ....................................................................................................................... 10
  Results ......................................................................................................................... 15
  Discussion ................................................................................................................... 19

Study 1: Phubbing in Parent-Child Relationships
  Literature Review ....................................................................................................... 23
  Phubbing ...................................................................................................................... 23
  IPART Theory ............................................................................................................ 25
  Methods ....................................................................................................................... 31
  Results ......................................................................................................................... 38
  Discussion ................................................................................................................... 47

Study 2: Phubbing in Romantic Relationships
  Literature Review ....................................................................................................... 51
  Developmental Interactionist Theory ........................................................................ 51
  Nonverbal Immediacy ............................................................................................... 56
  Affect Receiving Ability ............................................................................................ 59
  Methods ....................................................................................................................... 61
  Results ......................................................................................................................... 66
  Discussion ................................................................................................................... 73

General Discussion & Conclusion
  General Discussion ..................................................................................................... 77
  General Limitations & Future Directions ................................................................... 83
  Conclusion .................................................................................................................. 85

References ....................................................................................................................... 87

Appendices .................................................................................................................... 100
  Tables ......................................................................................................................... 100
  Figures ....................................................................................................................... 109
Introduction

Cell phone technology has improved communication in scope, distance, quantity, and quality; and research highlights the important role cell phones play in enhancing communication even between individuals who interact in-person regularly (Jin & Park, 2010). Yet, individuals who use cell phones to communicate with distant others may also be communicating, consciously or otherwise, with co-present others. For example, individuals who place their phones on the table in order to see incoming notifications are better positioned to receive messages from distant others. Yet, the act of placing the phone on the table may be communicative in and of itself, indicating a lack of availability to co-present others. Thus, the act may signal availability to some while also communicating unavailability to others.

Research assessing the interpretations of phone usage during face-to-face communication becomes increasingly important as access to such technology continues to expand. Pew Research (2019a) now reports that, within the United States, 99% of individuals between the ages of 18 and 29 own cell phones and 96% own smart phones. Numbers from the general population are only slightly lower than this (i.e., 96% & 81% respectively). Although ownership is more common in countries with advanced economies, Pew Research (2019b) estimated that more than 5 billion individuals own mobile devices worldwide. As we adapt to the ever-changing technological landscape, it is important to understand how the physical presence and usage of communicative devices are changing face-to-face communication. Thus, this study examines both the ‘mere presence’ hypothesis, which suggests that even the mere presence of a phone during face-to-face conversations diminishes the quality of communication (Przybylski & Weinstein, 2013), and phubbing, which is the act of snubbing a conversation partner by diverting attention towards one’s cell phone (Roberts & David, 2016).
In order to assess the ‘mere presence’ hypothesis and phubbing in ways that are unique and inclusive of relational and individual covariates, tests will also include a number of additional variables. For example, drawing upon interpersonal acceptance-rejection theory (IPARTheory; Rohner, 2016), this study will analyze phubbing in relation to parental acceptance (i.e., the degree to which adult children recall feeling accepted by their parents) and rejection sensitivity (i.e., the degree to which individuals are pre-attuned to interpret the behaviors of others as rejection oriented even when they are not). Similarly, drawing upon developmental interactionist theory (DIT; Buck, 1984, 1989, 1994), this study will analyze phubbing in relation to immediacy (i.e., nonverbal cues which signal interest and cognitive attention) and affect receiving ability (i.e., the ability to accurately interpret the emotions of another). In order to test associations between these variables systematically, the following study unfolds in four steps.

First, because the purpose of the present study is to examine the way in which phones influence face-to-face communication, it is important to begin by determining the type of phone behaviors that influence conversations. Thus, this study begins by examining the results of pilot testing, which sought to explain whether the ‘mere presence’ of a cell phone during a conversation was enough to alter communication. Pilot testing failed to demonstrate support for the ‘mere presence’ hypothesis and highlighted inadequacies in the chosen measure for nonverbal immediacy, prompting important changes for Study 1 and Study 2.

Second, because the ‘mere presence’ hypothesis failed to receive support in pilot testing, the focus of the present study shifted from phone presence to phone usage (i.e., phubbing). Study 1, therefore, explores the effects of phubbing on parent-child relationships in order to determine whether parental phubbing influences a child’s tendency to phubb within their own adult relationships. In this study, IPARTheory is introduced as a framework through which parent-
child phubbing behaviors may be explained. Parent-child relationships are important to consider because recollections of parent-child relationships have been shown to influence communicative choices beyond childhood (see Konok, Bunford, & Miklosi, 2020, as an example). Thus, Study 1 seeks to explain the effects of parental phubbing and to uncover potential antecedents to phubbing in adult relationships.

Third, the effects of phubbing within adult romantic relationships are explored using the framework of DIT. Specifically, Study 2 explores the effects of phubbing on communication within adult romantic relationships to determine how tendencies to phub influence communication effectiveness during face-to-face interactions. Study 2 specifically examines phubbing as a nonverbal cue and its relation to emotional communication. Thus, whereas Study 1 examines how remembrances of parental phubbing influences the participant’s own phubbing behaviors as an adult, Study 2 examines how phubbing influences communication within adult romantic relationships.

Finally, findings from testing of the ‘mere presence’ hypothesis, parental phubbing, and romantic partner phubbing are summarized. Findings re-affirm previous research and indicate that phubbing is connected to negative outcomes in both parent/child and romantic relationships. Although phones continue to offer important communicative benefits, individuals will enhance their benefits as they learn to use them appropriately and within appropriate circumstances.
Pilot Testing

The purpose of the current study is to understand and explain the influence of cell phones during face-to-face conversations. It was therefore important to conduct a pilot test to determine the level of manipulation needed in order to instigate significant changes in communication outcome variables. Specifically, the pilot test was used to determine if the mere presence of a phone during a conversation would be impactful enough to illicit changes in outcome variables or if a stronger manipulation was needed.

The “Mere Presence” Hypothesis

The ‘mere presence’ hypothesis suggests that the simple visibility of one’s cell phone during a face-to-face interaction reduces the quality of communication (Gergen, 2002). Although individuals may not cognitively notice the phone, a phone that is within line of sight during a conversation is thought to generate distraction, conscious or otherwise, that limits the connection between participants. This distraction might occur because the phone’s owner is anticipating potential communication with a distant other. It may also occur because the owner’s co-present conversation partner perceives the phone as a signal that the owner is not fully engaged in the conversation. Early research suggested that the presence of a nondescript phone during conversations between strangers led to decreased reports of relational satisfaction and feelings of empathy, particularly when conversations were considered more meaningful, even when the phone was not owned by either of the individuals involved (Przybylski & Weinstein, 2012).

Misra, Cheng, Genevie, and Yuan (2016) similarly argued that decreased levels of connectedness and empathy would occur during conversations among friends when either partner held their phone or placed it within view. Dwyer, Kushlev, and Dunn (2018) also noted that individuals who kept their phones out during a meal with friends reported higher levels of boredom than
those who stowed their phones out of sight. This increased boredom, they argued, occurred because visible phones reminded individuals of other, potentially more interesting, activities in which they might participate.

Recent research, however, has argued limitations to the ‘mere presence’ hypothesis. Specifically, Allred and Crowley (2017) suggested that phone presence has negative effects only on individuals for whom cell phones were salient during the conversation. Additionally, the ‘mere presence’ hypothesis has failed to replicate in populations consisting of individuals who grew up in homes where cell phone presence was common (Crowley, Allred, Follon, & Volkmer, 2018). It is therefore likely that individual or relational differences influence the degree to which phone presence affects communication.

In order to determine why the ‘mere presence’ hypothesis failed to replicate, further testing was necessary. It may be that individual and relational differences not measured in previous literature account for differences between the aforementioned studies (i.e., nonverbal skills, emotional expressivity, etc.). Just as likely, however, it may be that perceptions concerning the appropriateness of cell phone presence during face-to-face conversations have changed over recent years (Crowley, et al., 2018) such that cell phone presence is no longer seen as a violation of conversation expectations.

As the present study focuses only on cell phone behaviors that are considered harmful, it was important to test whether a manipulation related to the ‘mere presence’ hypothesis would be strong enough to induce negative communicative outcomes. That is, it was important to determine if cell phone presence alone constituted harmful behavior in terms of communication outcomes. Therefore, a pilot study tested the effects of cell phone presence on dyadic face-to-face conversations in order to determine whether the manipulation of phone presence alone
would be strong enough to influence outcome variables after controlling for individual and relational differences.

Importantly, of all the previous studies testing the ‘mere presence’ hypothesis, only Przybylski and Weinstein (2013) utilized a dyadic approach wherein both partners took part in the experiment and were measured simultaneously. Such an approach allows researchers to control for relational influences, making it easier to account for variance between dyads. Dyad testing also enables researchers to understand how manipulations influence relationships. Fuchs, Nussbeck, Meuwly, and Bodenmann (2017), noted that some individuals tend to react similar to their dyadic partners when introduced to external stimuli, particularly when the stimuli is first introduced, but others do not. Thus, dyadic measurements make it easier to parse out differences between reactions to the stimuli and reactions to partner behaviors. It was therefore also important to re-test the hypothesis using a dyadic approach. Thus, the present study tested the effects of cell phone presence on dyadic face-to-face conversations in order to determine if the lack of replication in previous work occurred due to dyadic differences or historical changes since the original study completed in 2013. Pilot testing began by assessing the basic assumption of the ‘mere presence’ hypothesis.

Pilot Hypothesis 1 (P-H1): Cell phone presence is negatively associated with conversation satisfaction.

Nonverbal Immediacy

Because cell phone usage during face-to-face communication is considered a nonverbal communicative cue (Crowley, et al., 2018), it is also important to consider how cell phone presence interacts with other nonverbal measures. One nonverbal variable that is important to consider is that of immediacy. Immediacy is a complex variable that is accurately praised for its
ability to improve communicative interactions (Andersen & Andersen, 2005), with research suggesting a rich relationship between immediacy and positive relational outcomes. Perceptions of immediacy have, for example, been associated with increased positive affect towards a message source (Martin & Mottet, 2011), improved satisfaction towards organizational leaders (Richmond & McCroskey, 2000), decreased student apprehension (Chesebro & McCroskey, 2001), and enhanced learning outcomes (Wilson & Locker, 2007).

With origins in psychology, immediacy is thought of as an approach behavior that communicates availability or attentiveness and generates positive affect (Mehrabian, 1971). The generally accepted definition within communication literature similarly suggests that immediacy includes behaviors that “signal availability, increase sensory stimulation, and decrease both the physical and psychological distance” between individuals (Andersen, Guerrero, Buller, & Jorgensen, 1998, p. 502; Andersen, 1985; Andersen & Andersen, 2005). In line with these definitions, three variables must take place in order for immediacy to occur: first, one individual must be attentive and/or available to the conversation, second, another individual must be present who perceives the first individual’s behaviors as attentive, and third, the interaction must result in decreased physical and psychological distance between the two individuals.

An alternative explanation for the different outcomes of the “mere presence” hypothesis may occur as a result of cell phone effects on immediacy. Because there are two ways in which environmental variables might influence immediacy, differences might occur as a result of the sender or the receiver. Previous research has focused primarily on how receivers interpret cell phone presence. As it is currently understood, the “mere presence” hypothesis suggests that receivers are negatively impacted by the sender’s cell phone, causing receivers to rate the
conversation less favorably (Allred & Crowley, 2017). However, another pathway through which phones might influence perceptions is through the sender.

Consistent with Gergen’s (2002) notion of absent presence (i.e., being physically present but mentally absent), it may be, instead of directly influencing the receiver, that the sender’s phone negatively impacts the sender’s mentality during the conversation. In this way, the cell phone inhibits the sender’s contribution to the conversation which, in turn, lowers the receiver’s perceptions on variables that are seemingly unrelated to the phone. Thus, variability may occur as a result of the sender’s experience with the phone, rather than the receiver’s. For example, just as cell phone presence distracts the sender from accomplishing complex tasks (Thornton, Faires, Robbins, & Rollins, 2014), cell phone presence is likely to inhibit sender attentiveness during conversations and therefore negatively influence their ability to express immediate behaviors. It may be, therefore, that individuals who have their phone out during conversations are less immediate. This, in turn, causes their partner to perceive less immediate behaviors and to be less satisfied with the conversation, not so much because they notice the phone but because they perceive that their partner is distracted.

It is important to note that immediacy has consistently been connected with measures of relational and conversation satisfaction (see Richmond & McCroskey, 2000, as an example). It is therefore hypothesized that individuals who rate their partners as being more immediate will also report higher levels of conversation satisfaction. Perceptions of immediacy, in turn, depend upon individuals being attentive during conversations (Andersen & Andersen, 2005). Because cell phone presence may distract individuals from fully engaging within the conversation, cell phone presence may reduce perceptions of immediacy. Thus, immediacy may act as a mediator
between phone presence and conversation satisfaction such that phone presence reduces perceptions of immediacy and perceptions of immediacy increase conversation satisfaction.

P-H2: Perceptions of partner immediacy mediate the relationship between cell phone presence and conversation satisfaction such that cell phone presence is negatively associated with immediacy and immediacy is positively associated with conversation satisfaction.

Affect Receiving Ability

Whereas the burden of immediacy often falls upon the sender, at least one aspect of immediacy depends upon the communicative skill of the receiver. Receivers must be able to accurately determine if the sender is attentive, because it is the correct assessment between actual and perceived attentiveness that leads to a shared psychological state. For example, Kring, Smith, and Neale (1994) found that individuals who are more emotionally expressive are rated as more immediate by their conversation partners because their emotional expressions make it easier for conversation partners to detect when they are attentive and interested in the conversation. Yet, individuals who are not emotionally expressive may still display nonverbal cues related to immediacy in ways that are more subtle, and their conversation partners must be adept to decode these subtle messages appropriately. Thus, an individual’s affective receiving ability (ARA), or their ability to recognize and interpret the emotions of others (Buck, 1976; Buck, Miller, & Powers, 2017), may also influence perceptions of immediacy.

Specifically, individuals who are better at recognizing the emotional expressions of their partner should also be better at recognizing nonverbal immediacy, even when such cues are not obvious to others. As romantic partners often communicate with one another more than they do with others, they tend to be better at recognizing their partner’s emotions than other people
would be (Sabatelli, Buck, & Dreyer, 1982). Conversely, individuals who are better at recognizing their partner’s emotional expressions should also be better at recognizing the absence of immediacy, even when others would not. It therefore makes sense that individuals with high ARA would be better attuned to immediacy cues when such cues are present and also better attuned to recognizing when such cues are not present.

Similarly, it is expected that the skill of recognizing the emotions of one’s partner would also influence the impact of potentially negative behaviors. Specifically, the relationship between cell phone presence and immediacy may be moderated by affect receiving ability because individuals who are good at detecting their partner’s emotions are quick to notice when their partner is distracted by their phone. Thus, the following hypothesis is proposed (Note: hypothesized relationships for pilot testing may be viewed in Figure 1):

P-H3: Affect receiving ability moderates the relationship between cell phone presence and perceptions of immediacy, such that the relationship between phone presence and immediacy is stronger when affect receiving ability is high.

**Pilot Methods**

**Design**

Hypotheses were tested using a pre-test/post-test experimental design wherein two groups were compared: the cell phone present experimental group, and the cell phone absent control group. Participants were randomly assigned into conditions. Participants first completed pre-test questionnaires, then participated in 10-minute conversations with their partner, and ended by completing post-test questionnaires.
Sample

After receiving approval from the Institutional Review Board, 74 undergraduate students (i.e., 37 dyads) were recruited from the COMM 1000 Introduction to Communication course at the University of Connecticut and offered minimal course credit for participation. Whereas findings from this population may not be generalizable, individuals in this age group are likely to own and use a cell phone regularly and their responses may be indicative of future attitudes of this generation towards technology. Participants were females (64.9%) and males (35.1%) from a largely white sample: white (74.1%), Asian/Pacific Islander (18.9%), Black/African American (1.4%), Hispanic (1.4%), Native American (1.4%), French Canadian (1.4%), or multi-racial (1.4%). Participants were between the ages of 18 and 22 ($M = 19.11, SD = 1.02$) and typically owned their first phone as early teenagers ($M = 13.68, SD = 1.65$). Participants were offered minimal course credit for participation.

Power Analysis. To match the original study (Przybylski & Weinstein, 2013), which utilized 74 participants and demonstrated a large effect of phone presence on conversation quality (i.e., $\beta = -.45$), this pilot test also utilized 74 participants. This sample size was enough to detect large effects ($P = .98$). However, a post-hoc dyadic power analysis using APIMpower (Kenny & Ackerman, 2019) indicated that this sample size only had a power of .47 to detect small effects and therefore may have missed smaller effects.

Procedure

Upon expressing interest, participants signed up for a time to bring either a romantic partner (4 dyads) or a close personal friend (33 dyads) to the interpersonal lab. Individuals were first provided key information concerning study procedures and asked to provide signed consent. Dyads were randomly assigned to either experimental (cell-phone presence; $N = 18$) or control
(cell-phone absence; \(N = 19\)) groups. Individuals in the experimental condition were also randomly assigned as either senders or receivers. That is, within the experimental condition, one individual was assigned to pull out their phone during the conversation (sender) whereas the other was not (receiver).

Couples were separated and escorted into two separate rooms to complete the pre-survey and to receive individual instructions. The pre-survey included materials for informed consent, the CARAT (see below), and the relationship satisfaction scale (used as a baseline measure). Participants were also asked to list three important topics that they would like to discuss with their partner.

Before bringing participants into the same room as their romantic partner, all individuals in the cell phone absence condition, as well as individuals assigned as receivers in the cell phone presence condition were given the following instructions:

You and your conversation partner will be given ten minutes to discuss an important topic of your choosing. Please compare your three topics with the three topics your partner chose and pick one topic that appears on both lists. If there are no repeated topics, choose one of the six topics that is most important to you as a couple. You may then discuss the topic for 10 minutes. After 10 minutes, a lab assistant will let you know that the time is up and will direct you to the next stage of the experiment.

Individuals assigned as senders in the cell-phone presence condition were given the same instructions along with this additional note:

Please provide the lab assistant with your cell-phone number. Before beginning your conversation, please place your phone on the coffee table where you can clearly see it. The lab assistant may, at some point during your conversation, text you with further
instructions (note: the lab assistant then mimicked saving the participant’s number in a phone, but the number was not actually saved).

Because previous research has suggested that the ‘mere presence’ hypothesis is more prevalent in meaningful conversations (Misra et al., 2016), dyads were each asked to choose one conversation topic from the lists they had created separately that they felt would lead to a meaningful conversation. They were then left alone to complete their conversations so that they would be comfortable discussing sensitive information. Participants assigned as senders in the experimental group were asked to provide phone numbers in order to create anticipation that their phone might go off during the conversation, similar to what individuals experience during “real-world” conversations. Upon completing their 10-minute conversation, couples were again separated into two rooms to complete post-survey questionnaires. Post-survey measures included conversation satisfaction, perceptions of partner immediacy, and demographics. Participants were then debriefed, informed of the true nature of the experiment, asked for post-hoc consent, and provided an opportunity to ask any questions they may have had about the study.

Measures

**Immediacy.** Perceptions of immediacy were measured using 11 items from Andersen & Andersen’s (1979) Behavioral Indicates of Immediacy scale adapted for a single conversation. These items assessed the individual’s perception of their partner’s immediacy behaviors during the conversation. This scale included items such as “My partner engaged in more eye contact with me than they usually do,” “My partner’s body was more tense than normal,” “My partner had a more relaxed body position than they have had in previous conversations,” “My partner engaged in less movement than normal,” “My partner touched me less than they usually do,” “My partner smiled more than normal,” “My partner seemed eager to spend time talking to me,”
“My partner was more vocally expressive than normal,” “My partner used gestures more than they usually do,” “My partner directed his/her body position more toward me than they usually do,” and “My partner seemed more distant than normal.” Initial reliability testing suggested that this scale failed to meet the minimal acceptance level ($\alpha = .46$). Items were tested individually, and the lowest loading item was dropped systematically in order to determine if removal of the item would improve reliability. Only after removing all of the reverse scored items (note: reverse scored items are noted in italics) did this scale reach an acceptable point of reliability ($\alpha = .78$). The modified 7-item scale was therefore used for analyses, which must now be interpreted in light of these changes.

**Conversation Satisfaction.** Conversation Satisfaction was measured using 9 items from Hecht’s (1978) Interpersonal Communication Satisfaction Inventory. Items were presented on a 7-point Likert-type scale (1 = strongly disagree, 4 = neither agree nor disagree, & 7 = strongly agree) and measured the individual’s level of satisfaction with the most recent conversation. The scale included items such as “I am very dissatisfied with our recent conversation,” “I feel that during our recent conversations, I was able to present myself as I wanted my partner to view me,” and “My conversation partner expressed a lot of interest in what I have to say.” The same scale was adapted to measure general communication satisfaction within the relationship (measured during pre-test). This scale was reliable at both pre- ($\alpha = .83$) and posttest ($\alpha = .80$).

**Affect Receiving Ability.** ARA was measured using Buck’s (2017) Communication of Affect Receiving Ability Test. In this measure, participants are tested on two different tasks: CARAT-S and CARAT SPR. In the CARAT-S, which measures emotional empathy, participants were shown 24 six second video clips of others who are experiencing different emotions. Participants determined if individuals in each clip were experiencing a positive, negative, or
neutral emotion. In the CARAT-SPR, which measures cognitive empathy, participants were shown 24 six second videos of others who were asked to respond to emotionally charged images spontaneously (i.e., spontaneous), to pose as if seeing an emotionally charged image when none was present (i.e., posed), or to mimic seeing an emotionally charged image while an image of the opposite valence was actually present (i.e., regulated). Participants then determined if each clip showed a spontaneous, posed, or regulated emotion. Participants received an ARA score based on the number of clips that they rated correctly. This form of analysis has shown significant correlation with other measures that demonstrate ability to recognize the emotions of another individual (Boone & Buck, 2004). Participants received a percent-score depending upon the number of items they accurately matched with the correct answer for the CARAT-S ($M = .95, SD = .07, Range = .54-1.00, \alpha = .69$) and the CARAT-SPR ($M = .42, SD = .12, Range = .15-.73, \alpha = .45$). Because the CARAT-SPR did not meet acceptable ranges, only the CARAT-S was used to calculate affective receiving ability within pilot testing.

**Manipulation Check.** Lab assistants manually checked for phone presence/absence at the beginning and end of each conversation and reported that participants appropriately followed instructions concerning phone placement. However, one additional item was utilized to determine whether participants noticed phone presence. Although the ‘mere presence’ hypothesis does not require individuals to cognitively recognize phone presence, it is interesting to see how many participants were able to accurately recall presence. Participants were asked to recall whether their partner’s cell phone was visible throughout the conversation (i.e., yes, no, & can’t recall). Because Allred and Crowley (2017) suggested that individual recollections of phone presence may be more important than actual presence, this new variable was effects coded (yes = 1, can’t recall = 0, no = -1) and used within post-hoc analysis. Although all assigned conditions
occurred according to the design, a number of participants recalled phone presence when a phone was not actually present \( (N = 16) \) and vice-versa \( (N = 15) \), again suggesting that individuals are not always accurate when recalling phone presence.

**Pilot Results**

In line with Kline (1998) all measures were first checked for skewness and kurtosis and were determined to fall within acceptable ranges \( (<3 \text{ and } < 10, \text{ respectively}) \). A number of variables were considered as potential covariates. Specifically, because older individuals are influenced by phone presence more than younger individuals (Forgays, Hyman, & Schreiber, 2014) and because overall relationship satisfaction (i.e., pre-test satisfaction) may account for variance in conversation satisfaction, both age and pre-test relationship satisfaction were tested as potential covariates (see Table 1). Age was correlated with perceptions of immediacy \( (r(74) = .24, p = .042) \) and with conversation satisfaction \( (r(74) = -.25, p = .029) \), and was therefore used as a covariate within each analysis. Pre-test relationship satisfaction, which was positively correlated with conversation satisfaction \( (r(74) = .524, p < .001) \), was also used as a covariate for models testing conversation satisfaction as an outcome variable.

**Hypothesis Testing**

Due to the dyadic nature of data, hypotheses were tested using Hierarchical Linear Modeling (HLM; Raudenbush & Bryk, 2002), which assumes nonindependence between dyad partners and allows for nested data. Before data were entered into HLM, an additional variable was created (i.e., dyad assignment) to indicate the connection between participants and their conversation partners. This variable is used within HLM to determine variance between level one and level two equations. Condition \( (1: \text{ phone present}, -1: \text{ phone absent}) \) was defined at level 2 (dyad level), whereas covariates (i.e., age, perceptions of immediacy, & pre-test satisfaction)
were defined at level 1 (person level). The intraclass correlation coefficient (ICC) was determined by testing unconditional models using conversations satisfaction as the outcome variable (ICC = .30, p = .002), which suggests that variance occurs both between dyads and between partners within dyads (note: an ICC of 1 would indicate variance between dyads but no variance between partners; Garson, 2013). Therefore, the general equation for level one was:

\[ OV_{ij} = \beta_{0j} + \beta_1X_{1ij} + \beta_2X_{2ij} + e_{ij} \]

where \( B_{0j} \) reflected the relational outcome, \( B_1 \) reflected the estimated population slope of age, \( B_2 \) reflected pre-test satisfaction, and \( e_{ij} \) represents level 1 error. The equation for level 2 was:

\[ \beta_{0j} = G_{oo} + G_{01}X_{1j} + u_{0j} \]

where \( G_{oo} \) reflected the person level intercept for an average person and \( G_{01} \) referred to the effect of the phone condition. In accordance to recommendations from Raudenbush and Bryk (2002), variables were standardized before analyses occurred.

Because the ‘mere presence’ hypothesis suggests that phone presence will influence conversations regardless of whether individuals recognize their presence (Przybylski & Weinstein, 2013), hypotheses were first tested using actual phone presence. P-H1 proposed a negative association between cell phone presence and conversation satisfaction. After controlling for interdependence between relational partners (\( \beta = .01, n.s. \)), age (\( \beta = -.20, p = .09 \)), and pre-test relationship satisfaction (\( \beta = .66, p < .001 \)), results suggested that cell phone presence had no significant effect on conversation satisfaction (\( \beta = -.12, n.s. \)). P-H1, therefore, was not supported.

P-H2 proposed a positive association between perceptions of immediacy and conversation satisfaction and that immediacy would mediate the association between cell phone presence and satisfaction. After controlling for interdependence between relational partners (\( \beta =
.01, n.s.), age (β = -0.23, p = .05), and pre-test relationship satisfaction (β = 0.69, p < .001), immediacy itself showed no direct association with relational satisfaction (β = 0.11, p = .07) or cell phone presence (β = -0.13, n.s.). Therefore, immediacy did not moderate the association between phone presence and conversation satisfaction. P-H2 was not supported.

P-H3 proposed a negative association between cell phone presence and perceptions of partner immediacy, moderated by affect receiving ability. After controlling for interdependence between relational partners (β = 0.07, n.s.) and age (β = 0.24, p = .040), results suggested that the assigned condition had no effect on perceptions of partner immediacy (β = 0.08, n.s.). Although affect receiving ability was associated with immediacy (β = -0.27, p = .019), it showed no association with cell phone presence (β = -0.02, n.s.). The interaction term (condition by affect receiving ability) also showed no significant association with immediacy (β = 0.17, n.s.). That is, individual ability to recognize affect had no moderating influence on the association between cell phone presence and immediacy. P-H3, therefore, also received no support.

**Post-hoc Testing.** Because previous research suggests that the recollection of cell phone presence, rather than presence itself, may influence conversation satisfaction (Allred & Crowley, 2017), it was important to test the hypothesis again using participant recollections of phone presence. However, findings from these subsequent tests produced no different results than those that came from testing actual phone presence. Therefore, findings suggest that cell phone presence, recalled or actual, had no significant effect on perceptions of immediacy or conversation satisfaction.

It was however, interesting to note that, after controlling for interdependence between relational partners (β = 0.00, n.s.) and age (β = 0.24, p = .035), individual affect receiving ability was negatively associated with immediacy (β = -0.27, p = .019) highlighting the association
between emotional recognition and immediacy. Importantly, this relationship was negative, suggesting that individuals with higher levels of affect receiving ability were more likely to report their partners as being less immediate during conversations of this nature.

**Limitations for Analyses**

It is important to note that findings of the present study must be considered in relation to the potential limitations of the study. For example, the sample consisted primarily of white college aged students, a population with high levels of cell phone addiction (see Allred & Atkin, 2020, as an example), who likely had other distractions even during the controlled experiment. Perhaps more importantly, research suggests that individuals in this population are likely to be outliers compared to other populations (Henrich, Heine, & Norenzayan, 2010). Findings, therefore, may not be generalizable to broader populations. Additionally, although the sample size and power in this pilot study matched those of earlier studies on the ‘mere presence’ hypothesis (i.e., Przybylski & Weinstein, 2013; Thornton et al., 2014; Allred & Crowley, 2017; Crowley et al., 2018), this sample size produces only enough statistical power to detect large effects. When Przybylski and Weinstein used a similar design in 2013, cell phones were more novel than they are today and may have had a larger influence on conversations. It may be that the influence of cell phone presence has now become small enough that it was not detected with such a small sample size.

More importantly, the measure for immediacy presents a number of complications. First, the full scale failed to achieve appropriate reliability. Second, the 4 items that were removed from analyses were those that were reverse coded. Immediacy, as measured in this study, was therefore only a reflection of positive behaviors that may have signified immediacy, and did not include important behaviors that may signal the lack of immediacy (i.e., tension in the body, the
lack of touch, etc.). Finally, items reflected deviations in immediacy, rather than immediacy itself. For example, rather than asking participants if their partner was nonverbally expressive, participants were asked if their partner was more/less expressive than normal. This form of questioning may have introduced an added level of variance in participant experience that is difficult to account for in model testing. The following discussion should therefore be considered in light of these limitations.

**Pilot Discussion**

Though the ‘mere presence’ hypothesis stoked an initial conversation concerning cell phones and communication (Przybylski & Weinstein, 2013), evidence of this study mirror other recent studies suggesting that presence alone may not be influential during face-to-face conversations (Crowley et al., 2018). However, despite the lack of significant findings in the present study, results highlight important implications for further understanding the role cell phones play in face-to-face conversations. Three important implications can be drawn from the present findings.

First, pilot testing suggested that manipulating cell phone presence alone was not enough to cause consistent changes in communication outcome variables. Consistent with Allred and Crowley’s (2017) study, perceptions of partner phone usage may be more important than simple phone presence. Therefore, future research should focus on perceptions of partner phone usage that causes their partner to feel snubbed, rather than those that merely indicate a phone was present during the conversation. For example, the phenomena known as phubbing (David & Roberts, 2017), which reflects phone *usage* rather than *presence* during face-to-face conversations, may be a better way to capture cell phone effects. In addition to measuring phone usage, researchers should also measure the way in which phone usage is perceived by
conversation partners. As noted by Miller-Ott and Kelly (2016), cell phone usage itself is not inherently problematic. Instead, it is the way in which the phone is used that causes phone usage to become problematic, specifically, when phone usage violates the expectations of one’s conversation partner. Therefore, Study 1 and Study 2 will focus on perceptions of partner phone usage that causes their partner to feel snubbed, rather than those that merely indicate a phone was present during the conversation.

Second, findings call into question the relationship between immediacy and conversation satisfaction. Although individual perceptions of immediacy varied, these perceptions were not predictive of overall conversation satisfaction. This suggests that the role of nonverbal immediacy may not be as important to overall conversation satisfaction as previously noted. It may be that younger generations care less about nonverbal cues that signal availability, favoring instead more digital reflections of connectivity (Downey & Gibbs, 2020). However, it is important to note that the measure used in pilot testing captured deviations in immediacy, rather than simply immediacy itself. It is very possible that individuals who were very immediate during the conversation were no more or less immediate than normal, causing their partners to rate them lower in terms of deviations in immediacy. This may explain why immediacy was not significantly correlated with conversation satisfaction. Study 2 will further explore this association. However, in order to do so, a newer, more reliable measure will be used.

Third, affect receiving ability did not moderate the relationship between phone presence and immediacy, but was negatively correlated with perceptions of immediacy. This finding suggests that individuals who are better at recognizing the emotions of others were more likely to report lower levels of immediate behaviors for their partners. This may occur because these individuals are hypersensitive to their partner’s emotions and recognize any inconsistencies that
may have occurred between spontaneous and symbolic messages. For example, individuals with high affect receiving ability may be reading negative cues that were meant to be hidden by their conversation partners, such as microaggressions. Conversely, individuals with lower levels of affect receiving ability may instead be focused on a more gestalt impression, missing out on the smaller details of their partner’s behavior. It may also be that individuals with high ARA have higher expectations for immediacy, perhaps because they care more about emotional expressivity. The ability to accurately detect and interpret the emotions of one’s conversation partner is therefore an important skill to consider when analyzing outcomes related to nonverbal messaging. Thus, although affect receiving ability did not moderate the effects of cell phone presence, it remains an important aspect of face-to-face communication and will be measured as a correlate of immediacy in Study 2.

These findings suggest that general expectations towards face-to-face conversations have shifted over recent years and highlight the need to shift from studying phone presence to studying phone usage during face-to-face conversations. It may be that individuals no longer expect immediate behaviors from their co-present partners because they are able to get needed social support by turning to their devices. It may also be that individuals are influenced by the presence of their partner’s phone to a lesser degree because they, themselves, are also accustomed to having their phones available while in the presence of friends and romantic partners. These findings concerning immediacy are suspect, due to the poor quality of measurement, but general findings highlight the importance of studying and restudying these phenomena as communication behaviors attempt to adapt along with ever-changing technological advancements.
Study 1: Phubbing in Parent-Child Relationships

Along with the “mere presence” hypothesis, recent research has also begun to investigate the act of using electronic devices during face-to-face interactions. For example, in the field of psychology, the term “technoference” has been coined to represent any disruption that occurs as a result of technology within interpersonal relationships (i.e., televisions, computers, tablets, etc.; McDaniel & Radesky, 2018). As a subsection of technoference, many scholars have looked specifically at phone usage during face-to-face conversations because phones themselves are now mobile and seemingly ever-present.

Phubbing, the act of snubbing a conversational partner by diverting attention towards one’s cell phone, occurs when individuals check and use their phone while in the presence of another individual (Roberts & Davids, 2016). Phubbing has become increasingly common during social interactions (Chotpitayasunondh & Douglas, 2016) and seems to influence conversations more consistently than the mere presence of a phone. For example, Hales et al. (2018) found that phubbing negatively influenced relational evaluations during both serious and casual conversations. It is therefore important to consider how phubbing may influence face-to-face communication.

There are two central differences between phubbing and the “mere presence” hypothesis. First, phubbing involves active engagement with one’s phone. For example, an individual may simply hold onto and even glance at their phone during a conversation without phubbing their partner. However, once any manipulation of the phone occurs (e.g., unlocking or increasing the phones brightness in order to view a message), phone presence crosses over into phubbing behavior. Subsequently, whereas simple phone presence may or may not cause an individual to
divert their attention from the conversation, phubbing inherently involves focused attention, however brief, upon one’s phone.

The act of phubbing may be harmful in at least two forms. First, phubbing is likely to communicate, at least nonverbally, a lack of interest in one’s conversation partner (Aagaard, 2019). Regardless of intent, the act of phubbing diverts attention away from co-present others. It is also likely to signal a closing of the relational frame, which Scheflen (1973) argued occurs when individuals nonverbally indicate that they do not want to be approached. Thus, even if only momentarily, phubbing may incite feelings of neglect, disinterest, or rejection. Second, phubbing is likely to limit an individual’s ability to create healthy relationships with co-present others. Ironically, many individuals report engaging in phubbing behaviors because of societal pressures to remain in constant connectivity with their peer group, yet these same individuals often report higher levels of social exclusion after participating in a conversation in which phubbing has occurred (David & Roberts, 2017).

Because young adults admit to phubbing their peers and romantic partners despite being aware of the potential negative consequences (Aagaard, 2019), Study 1 explores possible antecedents of phubbing. One potential reason adults choose to phub involves recollections of their own parents’ phone usage. For example, Xie, Chen, Zhu, & He (2019) found that children who witnessed their parents’ over-use of cell phones were more likely to become addicted to their own phones. It is likely that parental phubbing similarly influences a child’s behavior well into adulthood. Thus, parent-child relationships are important to consider because recollections of parent-child relationships have been shown to influence communicative choices beyond childhood (see also Rohner, 2016).
Study 1, therefore, examines participant remembrances of parental acceptance and rejection as well as their parents’ phubbing behaviors in order to determine whether parental phubbing influences a child’s tendency to phub within their own adult relationships. Findings from Study 1 will later be used in conjunction with findings from Study 2, which explores the effects of phubbing on communication within adult romantic relationships. Thus, Study 1 examines how remembrances of parental phubbing influences the participant’s own phubbing behaviors as an adult and Study 2 examines how phubbing influences communication within adult romantic relationships.

**Phubbing in Parent-Child Relationships**

Interpersonal acceptance-rejection theory (IPARTheory), which attempts to explain antecedents and effects of interpersonal acceptance and rejection (Rohner, 2016), provides a useful framework through which phubbing behaviors within parent-child relationships may be further explained. One major postulate of IPARTheory suggests that when children experience rejection from attachment figures, it “involves one or a combination of the following elements: emotional coldness, hostility, aggression, indifference, neglect, and/or withdrawal of behaviorally expressed affection” (Ibrahim, Rohner, Smith, & Flannery, 2015, p. 52). These rejection behaviors, in turn, influence the child’s perceptions of self in a way that is carried into their adult relationships. For example, individuals who feel that they experienced rejection as a child reported greater levels of depression and were more likely to exhibit self-silencing behaviors in romantic relationships (Harper, Dickson, & Welsh, 2006).

IPARTheory suggests that an individual’s remembrance of their relationship with a childhood caregiver instigates emotional reactions to behaviors that occur in the individual’s adult relationships. In contrast to attachment theory, which assigns individuals to one of four
different attachment styles depending upon their levels of security with self and others (Ainsworth et al., 1978), IPARTheory focuses on how the individual’s feelings and mood are connected to their perceptions of the relationship quality with a specific other person (Ripoll-Nunez & Carrillo, 2016). Though both theories similarly discuss attachment figures, internal working models, and life-long effects of caretaker-child relationship, IPARTheory is particularly useful in this context because of its focus on exclusionary behaviors that influence an individual’s pre-attunement to feeling rejected.

**Phubbing and IPARTheory.** As phubbing tends to influence feelings of exclusion (David & Roberts, 2017), it is likely that the phubbing behaviors of parents will be associated with decreased feelings of acceptance among their children and will therefore act as a rejection cue. For example, parental cell phone usage negatively affects parental responsiveness by reducing timeliness and quality of responses to a child’s needs (Abels et al., 2018), and time spent on one’s phone takes away from time spent with children (McDaniel, 2019). Hales et al. (2018) noted that phubbing acts as an exclusionary behavior that causes individuals to feel unwelcome in the conversation. Thus, adult children who recall being phubbed by their parents are likely to report lower levels of remembered acceptance.

However, the child’s attitude towards their parents’ general phone usage is likely to play an important role in the connection between actual phubbing and recalled acceptance/rejection. For example, the influence of cell phone usage during a given interaction has previously been mediated by expectations for phone usage during the interaction (Miller-Ott & Kelly, 2015; Kelly, Miller-Ott, & Duran, 2017), such that phone usage is negative only when it causes one’s partner to feel that their expectations have been violated. Similarly, children who recall that their parents often spent time on a phone when they were together are likely to report lower levels of
satisfaction with their parents’ phone usage. This, in turn, is likely to cause them to report lower levels of acceptance.

H1a-b: Remembrances of (a) maternal and (b) paternal phubbing are negatively associated with remembrances of parental acceptance. However, this relationship is mediated by the level of the child’s satisfaction with their parents’ phone usage such that higher levels of recalled phubbing are associated with reduced levels of satisfaction with parental phone usage and reduced satisfaction with parental phone usage is negatively associated with remembrances of parental acceptance.

**Rejection Sensitivity.** Another important aspect of IPARTheory is rejection sensitivity, which is defined by a “hypervigilance and hypersensitivity to rejection by significant others” (Ibrahim, et al., 2015, p. 52). Individuals with high levels of rejection sensitivity are more likely to prescribe rejection as a motive to the behaviors of others (whether or not it was intended), be overly anxious about the possibility of being rejected, and overreact to either real or unintended rejection (Downey & Feldman, 1996).

Individuals who remember feeling accepted by their parents tend to report lower levels of rejection sensitivity, whereas those who remember feeling rejected by their parents report higher levels of rejection sensitivity (Ibrahim, et al., 2015). This likely occurs because individuals use relationships with their parents as a baseline through which they compare their role in future relationships. IPARTheory postulates that recollections of parental acceptance/rejection play an important role in adult relationships because they influence the individual’s awareness of and attunement towards rejection (Rohner, 2016). Specifically, IPARTheory asserts that remembrances of parental acceptance are negatively associated with reports of rejection sensitivity.
H2a-b: Remembrances of (a) maternal and (b) paternal acceptance are negatively associated with rejection sensitivity.

Although no known study has tested the relationship between satisfaction with parental phone usage and rejection sensitivity, the way an individual feels about their parents’ phone usage may also be related to reports of rejection sensitivity, even if only indirectly. Because cell phones play an integral part in modern communication, the degree to which an individual is satisfied with phone usage is a strong indicator of their general satisfaction levels (Miller-Ott, Kelly, & Duran, 2012). Individuals who are not satisfied with their parents’ phone usage, are therefore less likely to be satisfied with their relationship, generally. Thus, children who recall being dissatisfied with parental phone usage might report higher levels of rejection sensitivity. However, this association has not been tested previously, and it is unknown if this connection will be direct or only occur as it is mediated by recalled parental acceptance. Thus, this potential association is proposed as a research question:

RQ 1a-b: Are satisfaction levels with (a) maternal and (b) paternal phone usage associated with rejection sensitivity?

Problematic Cell Phone Usage. Furthermore, parental acceptance has shown a modest negative association with general cell phone addiction—commonly referred to as problematic cell phone usage (PCPU; Zhu et al., 2019). It is likely that children who were phubbed by their parents will be more likely to engage in PCPU as an adult. Specifically, Xie, Chen, Zhu, and He (2019) found a direct connection between parental phubbing and PCPU, indicating parental phone usage plays an important role in the child’s phone usage. A major premise of Xie et al.’s (2019) study suggested that parental phubbing acts as an exclusionary behavior, causing children to feel neglected. This feeling exacerbates the child’s own cell phone usage, and, in a cyclical
pattern, adult children who recall being phubbed by their parents tend to engage in similar behavior within their romantic relationships.

Similarly, McDaniel and Radesky (2018) found that children raised by parents who misused or were addicted to technology were more likely to also misuse their devices. PCPU is therefore likely to be connected directly to actual parental phone usage as children mimic their parents’ behaviors. However, as noted previously, the child’s attitude towards their parents’ phone usage may also play an important role. It may also be that children, who are displeased with their parents’ phone usage, turn to their own devices as a form of rebellion or in order to seek comfort they felt was lacking in their parent-child relationships. Additionally, because children who perceived being rejected by their parents have also reported higher levels of PCPU (Zhu et al., 2019), it is expected that lower levels of recalled parental acceptance will be negatively associated with PCPU, such that individuals who felt rejected by their parents are more likely to engage in PCPU. Although previous work has investigated parental phone usage and PCPU, none have separated maternal and paternal differences. These differences may be important, given that individuals recall different emotions depending upon whether or not they consider maternal or paternal caregivers (Ibrahim, et al., 2015). Given these likely interactions, the following hypotheses are proposed.

H3a-b: Remembrances of (a) maternal and (b) paternal acceptance are negatively associated with PCPU.

H4a-b: Remembrances of (a) maternal and (b) paternal phubbing are positively associated with the child’s PCPU.

H5a-b: Satisfaction levels with (a) maternal and (b) paternal cell phone usage are negatively associated with PCPU.
Another predictor of PCPU may be an individual’s own sensitivity to rejection. Demircioğlu and Köse (2018) found that rejection sensitivity was positively associated with addiction to social media usage. In another study, this association was significant even though social media usage was more stressful for individuals with higher levels of rejection sensitivity (Borae, 2017). This connection likely occurs because individuals who are sensitive to rejection prefer mediated communication over face-to-face interaction because it is quicker, easier, and less threatening (Bardi & Brady, 2010), even though it may still be more stressful than it is for individuals with lower levels of rejection sensitivity. Thus, in a similar manner, individuals with higher levels of rejection sensitivity are more likely to become addicted to their cell phone as they attempt to access tools for mediated communication.

H6: Rejection sensitivity is positively associated with PCPU.

**Phubbing Behaviors Among Children.** Problematic cell phone usage, in turn, is likely to influence communication in other ways. For example, PCPU is positively associated with phubbing behaviors (Chotpitayasunondh & Douglas, 2016). That is, individuals who are addicted to their phones are more likely to phubb others during face-to-face conversations. Thus, parental phone usage may, directly and indirectly, lead to reciprocal phubbing behaviors. Directly, as parental phubbing and satisfaction with parental phone usage may directly impact the child’s own phubbing behavior because the child mimics their parents’ phubbing behaviors. Indirectly, as children experience greater levels of rejection sensitivity, begin to use their own phones problematically, and phubb others because of their constant phone usage. The following associations are therefore hypothesized:

H7: PCPU is positively associated with a tendency to phubb others.
H8a-b: Remembrances of (a) maternal and (b) paternal phubbing are positively associated with the child’s own tendency to phubb as an adult.

H9a-b: Satisfaction levels for (a) maternal and (b) paternal phone usage are negatively associated with the child’s own tendency to phubb as an adult.

**Study 1 Methods**

**Sample**

After receiving approval from the institution’s Internal Review Board (IRB), participants were recruited from an Introduction to Communication Course at the University of Connecticut in the United States as part of a larger study investigating phubbing in both parent-child and romantic relationships. Recruitment targeted students in an introductory communication course and offered research course credit for participation (i.e., participation took 10-20 minutes and equated to 10 points of course credit). This sampling technique provided a mixed sample of individuals who reported being single (N = 262) or in a current romantic relationship (N = 139). Due to the length of the combined questionnaire, and in order to reduce participant burnout, participants who reported being single answered only those questions which pertained to parent-child relationships (i.e., Study 1), whereas those who reported being in a romantic relationship answered only questions related to their romantic relationship (see Study 2).

Study 1, therefore, utilized only those participants who reported being single. Within this sub-sample, participants identified as female (50.0%) and male (50.0%) with some diversity in terms of ethnicity: white (66.8%), Asian/Pacific Islander (14.1%), Black/African American (8.4%), Latinx (7.3%), and Biracial (3.4%). Participants were required to be over the age of 18 (M = 19.38, SD = 1.32).
It is also important to understand participant relationships with their female (i.e., maternal) and male (i.e., paternal) primary caregivers. In terms of maternal caregivers, participants reported having been primarily raised by their mothers ($N = 255, 97.3\%$), grandmothers ($N = 3, 1.1\%$), an equal combination of the two ($N = 1, .4\%$), or having no maternal caregiver ($N = 3, 1.1\%$). In terms of paternal caregivers, participants reported having been primarily raised by their fathers ($N = 243, 92.7\%$), step-fathers ($N = 4, 1.5\%$), grandfathers ($N = 1, .4\%$), some other family member ($N = 1, .4\%$), or having no paternal caregiver ($N = 13, 5.0\%$).

G*Power was initially used to determine the sample size needed to achieve appropriate power based on previously determined and predicted effect sizes. The smallest effect size of phubbing previously noted was .15 (Wang et al., 2017), and it was expected that this would be the smallest effect size of the current study. Thus, to achieve power of .95 with an Alpha of .05 using a one-tailed test and up to five predictors, the suggested sample size was 204 participants to detect medium to small effects. A post-hoc power analysis found that the actual sample size of 262 participants was adequate to achieve power of .98 for detecting small to medium effects (i.e., $f^2 = .10$) with up to 5 predictors.

**Procedure**

This study utilized a cross-sectional survey administered to participants through Qualtrics. Interested students from an introductory communication course received either a digital link to the survey or an alternative assignment, depending upon their willingness to participate in the study. Those who chose to complete the alternative assignment did so on their own under the direction of their course instructor and no data was collected in conjunction with this study.
Participants who followed the link to the survey were first presented with a digital consent form (i.e., an IRB-Approved Information Sheet) discussing the purpose of the study, known risks and benefits of participation, and study procedures. A waiver of signed consent was obtained from IRB because of the minimal risk associated with this online survey, thus, those who agreed to provide consent did so by clicking “next” and were directed to questions concerning general demographic information. Participants who did not report being in a current romantic relationship responded to questions related to the present study (i.e., perceptions of parental phubbing, parental acceptance, rejection sensitivity, child phubbing, and PCPU).

An attention check was employed to increase the quality of data. Participants were provided with a simple definition of phubbing (i.e., the act of snubbing conversation partners by focusing on one’s cell phone rather than the conversation; Robert & Davids, 2017). Participants were then provided two scenarios (i.e., ‘You and your friend are in the middle of an important conversation when your friend becomes distracted by their phone and stops talking to you, focusing instead on their phone’ and ‘You are telling your friend a story and they put their phone into their pocket in order to pay attention to what you are saying’) and asked to identify which scenario represented phubbing behavior. Seven individuals were disqualified from participation due to incorrectly answering this question.

Upon completing the survey, all participants were thanked for their responses and redirected to a separate Qualtrics survey hosted by the instructor of the introductory communication course where they received research credit. This final step was taken to ensure that participant identities would not be linked to survey responses. Participants completed surveys on their own time and using their own computers/personal devices.
Measures

**Perceptions of Parental Phubbing.** Parental phubbing was measured using an adapted version of Roberts and David’s (2016) 9-item phubbing scale for each parent individually. Participants were asked to recall and report the cell phone behaviors of both their female and male primary caregivers on a scale of 1-7 where 1 = ‘Almost Never’ and 7 = ‘Almost Always.’ For example, items for female caregivers included: “During a typical mealtime that my primary FEMALE caregiver and I spent together growing up, she pulled out and checked her phone,” “My primary FEMALE caregiver placed her cell phone where she could see it when we were together,” “Growing up, my primary FEMALE caregiver kept her cell phone in her hand when she was with me,” “When my primary FEMALE caregiver’s cell phone would ring or beep, she pulled it out even if we were in the middle of a conversation,” “My primary FEMALE caregiver glanced at her phone when talking to me,” “During leisure time that my primary FEMALE caregiver and I were able to spend together growing up, she used her phone,” “My primary FEMALE caregiver did not use her phone when we were talking,” “My primary FEMALE caregiver used her cell phone when we were out together,” and “If there was a lull in our conversation, my primary FEMALE caregiver would check her cell phone.” After reverse scoring items indicated in italics, scores were averaged such that they ranged from 1-7 with higher scores representing greater degrees of phubbing. This scale was reliable for both primary female caregivers ($\alpha = .90, M = 2.67, SD = 1.20$) and primary male caregivers ($\alpha = .93, M = 2.70, SD = 1.37$).

**Cell Phone Satisfaction.** Satisfaction with parental cell phone usage (CPS) was measured using Miller-Ott et al.’s (2012) 7-item cell phone satisfaction scale. Participants were asked to report their satisfaction with their primary caregiver’s (male and female) cell phone
behaviors on a scale of 1-7 with 1 = Disagree Completely and 7 = Agree Completely. For example, items included: “I am happy with the way my FEMALE caregiver used her cell phone when we were together,” “My FEMALE caregiver's use of phones was fine,” “Cell phones are a source of conflict in our relationship,” “We had arguments of how my FEMALE caregiver used her cell phone when she was around me,” “I am satisfied with the way my FEMALE caregiver used cell phones in our relationship,” “A lot of our relationship arguments were about my FEMALE caregiver's use of her cell phone,” and “I'd like to change some things about the way my FEMALE caregiver used her cell phone when she was with me.” After reverse scoring items indicated in italics, scores were averaged with higher scores representing greater levels of satisfaction with the use of cell phones in the relationship. This scale was reliable for female (α = .91, M = 5.96, SD = 1.14) and male (α = .89, M = 5.88, SD = 1.35) primary caregivers.

**Parental Acceptance.** Perceptions of parental acceptance were measured using the Mother and Father short versions of the Adult Parental Acceptance-Rejection Questionnaire (PARQ; Rohner, 2002; 2004). Each version asks participants to report on childhood experiences of maternal or paternal acceptance and rejection. Each version consists of 24-items (7 warmth/affection, 6 hostility/aggression, 6 indifference/neglect, 4 undifferentiated rejection) concerning the parent’s behaviors and attitudes toward the child from the child’s perspective. Participants were asked to report the degree to which each item is true of their own experiences on a 4-point scale where 1 = ‘Almost Never True,’ 2 = ‘Rarely True,’ 3 = ‘Sometimes True,’ and 4 = ‘Almost Always True.’ Items included: My primary female (or male) caregiver: “Said nice things about me,” “Paid no attention to me,” “Made it easy for me to tell her things that were important to me,” “Hit me, even when I did not deserve it,” “Saw me as a big nuisance,” “Punished me severely when she was angry,” “Was too busy to answer my questions,” “Seemed
to dislike me,” “Was really interested in what I did,” “Said many unkind things to me,” “Paid no attention when I asked for help,” “Made me feel wanted and needed,” “Paid a lot of attention to me,” “Went out of her way to hurt my feelings,” “Forgot important things I thought she should remember,” “Made me feel unloved if I misbehaved,” “Made me feel what I did was important,” “Frightened or threatened me when I did something wrong,” “Cared about what I thought, and liked me to talk about it,” “Felt other children were better that I was no matter what I did,” “Let me know I was not wanted,” “Let me know she loved me,” “Paid no attention to me as long as I did nothing to bother her,” & “Treated me gently and with kindness.” After reverse scoring items indicated in italics, scores were summed, ranging from 24 to 96, with lower scores representing greater remembrances of parental acceptance. Both measures have shown consistent reliabilities (α = .89) across contexts and cultures (Khaleque & Rohner, 2002; Rohner, 2005). Within the present study, the PARQ was reliable for female (α = .95, M = 35.34, SD = 12.12) and male (α = .96, M = 38.64, SD = 14.23) primary caregivers.

**Rejection Sensitivity.** Rejection sensitivity was measured using the 13-item Interpersonal Rejection Sensitivity Scale (IRSS; Rohner, Molaver, & Ali, 2018). Participants were asked to report the degree to which each item was true of their own experiences on a 4-point scale where 1 = ‘Not at All True,’ 2 = ‘Not Very True,’ 3 = ‘Somewhat True,’ and 4 = ‘Very True.’ Items included: “I am sensitive to criticism from others,” “If my friends are in a bad mood, I tend to wonder if it is about me,” “I worry very little about what people may think of me,” “When I talk to people I do not know, I worry about what they might think of me,” “Disapproval by others has a negative effect on me emotionally,” “I worry about the kind of impression I have on people,” “I get upset if someone is critical of me,” “I find myself being watchful for possible signs of rejection in my interactions with people,” “I worry about what
people think of me even when I know it is unimportant,” “I am often afraid that people will find fault with me,” “When I cannot hear what people are talking about, I worry that they might be saying something negative about me,” “I am rarely concerned about the impression I make on people,” “I become tense if I think I am being judged by someone.” After reverse scoring items indicated in italics, scores were summed, ranging from 13 to 52, with higher scores representing greater levels of rejection sensitivity. This scale was reliable (α = .91, M = 35.22, SD = 7.36).

**Problematic Cell Phone Usage.** PCPU was measured using the Mobile Phone Problem Use Scale (Bianchi & Phillips, 2005). This measure included 5 items that were rated on a scale of 1-7 where 1 = ‘Strongly Disagree,’ and 7 = ‘Strongly Agree.’ Items reflected the degree to which participants felt addicted to their phone and included “I spend time on my phone when I should be doing other things, which causes problems,” “I have tried to spend less time on my phone but have been unable to do so,” “I have tried to hide from others the amount of time I spend on my phone,” “Cell phone use has taken away hours of my sleep,” and “My performance has suffered due to the time I have spent on the phone.” Participant scores were averaged with higher scores representing a larger degree of problematic phone usage. This scale was reliable (α = .81, M = 3.95, SD = 1.26).

**Child Phubbing.** Child phubbing (i.e., the participant’s own phubbing behaviors) was measured using an adaptation of the Roberts and David’s (2016) 9-item phubbing scale. Participants were asked to recall and report their own cell phone behaviors on a scale of 1-7 where 1 = ‘Almost Never’ and 7 = ‘Almost Always.’ Items included: “During a typical mealtime that I spend with other people, I pull out and check my phone,” “I place my cell phone where I can see it when I am with other people,” “I keep my cell phone in my hand when I am with other people,” “When my cell phone rings or beeps, I pull it out even if I am in the middle of a
conversation,” “I glance at my phone when talking to other people,” “During leisure time that I am able to spend with other people, I use my phone,” “I do not use my phone when I am talking to other people,” “I use my cell phone when I am out with other people,” and “If there is a lull in a conversation, I will check my cell phone.” After reverse scoring items indicated in italics, scores were averaged with higher scores representing greater amounts of remembered phubbing within the relationship. This scale was reliable ($\alpha = .86, M = 4.06, SD = 1.15$).

**Study 1 Results**

Data were first checked for normal distributions to ensure appropriateness in terms of skewness and kurtosis (< 3 and < 10, respectively; Kline, 1998). Because each measure fell within acceptable ranges, and no evidence of multicollinearity emerged between key study variables (see Table 2), scales were used as proposed. Scores for each scale were calculated by averaging or summing scale items such that each participant received a single composite score for each measure.

Although missing data were minimal, it was important to consider how to account for missing scores within analyses. Following the proposed steps for missing data (i.e., to determine first, whether missing data was minimal, and second, whether missing data was connected consistently to the same few participants or if it was randomly spread through the data), means and intercepts were utilized to account for missing data. Because missing data were not extensive, combining multiple imputations with maximum likelihood estimation was not necessary.

Previous literature suggests that at least some variance in outcome variables may occur because of the influence of demographic variables. For example, Ibrahim et al., (2015) noted that females and males reported differences in parental acceptance and Gauzzini, Durandoni, Capelli,
and Meringolo (2019) noted that older participants were less likely to phubb and less likely to report being phubbed by others. This may suggest that older participants and participants with older parents might be less likely to have experienced phubbing in parent-child relationships. Demographic variables were therefore checked against study variables for consideration as covariates. Linear correlations were utilized to determine if sex, age, age at which the individual owned their first phone, or age of primary caregivers were significantly correlated with any outcome variable. Any demographic with significant correlation was tested as a potential covariate within the respective model.

Sex was positively correlated with reports of maternal phubbing ($r(259) = .12, p = .049$), such that female participants were more likely to report being phubbed by their female primary caregiver. Additionally, female participants reported higher levels of rejection sensitivity ($r(262) = .24, p < .001$) and were more likely to engage in phubbing behaviors themselves ($r(262) = .18, p = .003$).

Age of participant was also significantly correlated with key study variables. Specifically, age was negatively correlated with reports of both maternal and paternal phubbing, suggesting that older participants were less likely to report having been phubbed by their primary female caregiver ($r(259) = -.12, p = .050$) and their primary male caregiver ($r(249) = -.21, p = .001$). The age at which participants owned their first phone was also significantly correlated with study variables, suggesting that participants who were older when they first owned their own phone were less likely to report having been phubbed by their primary female caregiver ($r(255) = -.19, p = .003$) and their primary male caregiver ($r(245) = -.14, p = .033$). Finally, the age of the primary female caregiver was negatively correlated with the female caregiver’s phubbing.
behaviors \((r(254) = -.17, p = .007)\) and the age of the primary male caregiver was negatively correlated with the male caregiver’s phubbing behaviors \((r(243) = -.28, p < .001)\).

**Model Testing**

In order to test relationships holistically, Hypotheses and Research Questions were analyzed using path modeling with maximum likelihood estimation in AMOS 22.0 software. Continuous variables (i.e., phubbing, phone satisfaction, parental acceptance/rejection, rejection sensitivity, problematic cell phone usage) were standardized to improve interpretability, whereas sex was effect coded (i.e., male = -1, female = 1).

For each model, the model chi-square, comparative fit index (CFI), and root mean squared error of approximation (RMSEA) were used to test for goodness of fit. A priori criteria were set as \(\chi^2/df < 3.00\), CFI > .90, and RMSEA < .05 (Browne & Cudeck, 1993; Kline, 1998). Fully saturated models were tested before analyzing hypothesized models. All non-significant non-predicted paths were then removed and models were tested as hypothesized. For hypothesized models that met a priori criteria for goodness of fit, individual paths were assessed for significance and effects levels. Bootstrap analysis using 5,000 bootstrap resamples was used to determine indirect effects within the model. If the 95% confidence interval did not include zero, it was assumed that the indirect effect was significant \((p < .05; Preacher & Hayes, 2004)\).

In total, six models were tested: the first tested paths for female caregivers using all participants, the second tested paths for female caregivers using only female participants, the third tested paths for female caregivers using only male participants, the fourth tested paths for male caregivers using all participants, the fifth tested paths for male caregivers using only female participants, the sixth tested paths for male caregivers using only male participants. Each model tested the predicted associations detailed in Hypotheses 1-9 and Research Question 1: (H1) a
negative association between parental phubbing and parental acceptance that is mediated by satisfaction with parental phone usage, (H2) a negative association between parental acceptance and rejection sensitivity, (H3) a negative association between parental acceptance and PCPU, (H4) a positive association between parental phubbing and PCPU, (H5) a negative association between satisfaction with parental phone usage and PCPU, (H6) a positive association between rejection sensitivity and PCPU, (H7) a positive association between PCPU and a child’s tendency to phubb, (H8) a positive association between parental phubbing and the child’s tendency to phubb, (H9) a negative association between satisfaction with parental phone usage and the child’s tendency to phubb, (RQ1) and a potential association between satisfaction with parental phone usage and rejection sensitivity.

**Female Primary Caregivers.** The first model tested these associations for female primary caregivers. Model fit for the hypothesized model was acceptable ($\chi^2$/df = .656, CFI = 1.00, and RMSEA < .001), therefore individual paths were assessed for significance as shown in Figure 3. Because previous work on IPARTheory has demonstrated differences based on gender (Ramírez-Uclés, González-Calderón, del Barrio-Gándara, & Carrasco, 2018), and gender differences occurred between many of the study variables in the present study (see Table 3), the model was tested again using, first, only female participants, and second, only male participants. Both of these additional models demonstrated appropriate goodness of fit indices: daughters, $\chi^2$/df = .621, CFI = 1.00, and RMSEA < .001 (see Figure 4) and sons, $\chi^2$/df = .809, CFI = 1.00, and RMSEA < .001 (see Figure 5).

**Male Primary Caregivers.** The next model tested these associations for male primary caregivers. Model fit for the hypothesized model was acceptable ($\chi^2$/df = 1.34, CFI = .98, and RMSEA = .028), therefore individual paths were assessed for significance as shown in Figure 6.
To detect differences between daughters and sons, it was again important to test this model using first, only female participants, and second, only male participants. These additional models demonstrated appropriate goodness of fit indices: daughters, $\chi^2/df = 1.12$, CFI = .98, and RMSEA = .023 (see Figure 7) and sons, $\chi^2/df = 1.29$, CFI = .96, and RMSEA = .038 (see Figure 8).

**Hypotheses Testing.** Findings from the combination of these models suggest that study hypotheses and research questions were met with mixed results. Findings for each model may be found in Figures 3-8. Additionally, each figure is divided into two parts: part A shows results with the inclusion of covariates and part B shows a simpler version excluding covariates.

H1 proposed a negative relationship between phubbing and remembrances of parental acceptance that would be mediated by satisfaction with parental phone usage. As predicted, phubbing was negatively associated with satisfaction with parental phone usage for maternal ($\beta = -.59, p < .001$) and paternal ($\beta = -.54, p < .001$) relationships (see Figures 3 & 6). In turn, satisfaction with parental phone usage was positively associated with parental acceptance for maternal ($\beta = .44, p < .001$) and paternal ($\beta = .48, p < .001$) relationships. A direct effect between phubbing and parental acceptance appeared for maternal ($\beta = .28, p < .001$) and paternal ($\beta = .20, p = .002$) relationships, however, these effects disappeared after introducing levels of satisfaction with phone usage into the model. This suggests that satisfaction with phone usage fully mediates the relationship between parental phubbing and parental acceptance for maternal (95% CI = [.161, .362], $p < .001; \beta = -.26$) and paternal (95% CI = [.196, .374], $p < .001; \beta = -.26$) relationships. Thus, H1 was supported.

H2 proposed that remembrances of maternal and paternal acceptance would be negatively associated with rejection sensitivity. This association was not significant for maternal ($\beta = -.08,$
n.s.) relationships, but was significant for paternal ($\beta = -.18, p = .01$) relationships (see Figures 3 & 6). After testing daughters and sons separately, findings suggest that paternal acceptance was associated with rejection sensitivity for sons ($\beta = -.26, p = .009$; Figure 8) but not for daughters ($\beta = -.12, n.s.$; Figure 7). Thus, H2 received partial support, indicating that parental acceptance is associated with rejection sensitivity only within paternal/son relationships.

RQ1 sought to determine whether satisfaction levels for parental cell phone usage are associated with rejection sensitivity. This association was not significant for maternal ($\beta = .10, n.s.$) relationships, but approached significance for paternal ($\beta = .13, p = .057$) relationships (Figures 3 & 6). However, after testing daughters and sons separately, findings suggest that satisfaction with paternal phone usage was not associated with rejection sensitivity for daughters ($\beta = .19, n.s.$; Figure 7) or sons ($\beta = .10, n.s.$; Figure 8). Thus, findings from RQ1 suggest that there is no significant relationship between satisfaction levels for parental cell phone usage and rejection sensitivity.

H3 proposed that remembrances of parental acceptance would be negatively associated with the child’s PCPU. This association was not significant for maternal ($\beta = -.09, n.s.$) or paternal ($\beta = -.11, n.s.$) relationships (Figures 3 & 6). However, after testing daughters and sons separately, findings suggest that this relationship was significant for paternal/daughter relationships ($\beta = .24, p = .012$; Figure 7). Thus, H4 received partial support, indicating that remembrances of parental acceptance are associated with PCPU, but only within paternal/daughter relationships.

H4 proposed that remembrances of parental phubbing would be positively associated with the child’s problematic cell phone usage (PCPU). This association was not significant for maternal ($\beta = .07, n.s.$) relationships, but was significant for paternal ($\beta = .19, p = .007$)
relationships (Figures 3 & 6). After testing daughters and sons separately, findings suggest that paternal phubbing was associated with rejection sensitivity for daughters ($\beta = .26, p = .009$; Figure 7) but not for sons ($\beta = .10, n.s.;$ Figure 8). Thus, H3 received partial support, indicated that parental phubbing is positively associated with PCPU, but only within paternal/daughter relationships.

H5 proposed that satisfaction with parental cell phone usage would be negatively associated with PCPU. This association was not significant for maternal ($\beta = .08, n.s.$) relationships, but was significant for paternal ($\beta = .17, p = .032$) relationships (Figures 3 & 6). After testing daughters and sons separately, findings suggest that satisfaction with paternal phone usage was associated with rejection sensitivity for daughters ($\beta = .27, p = .015$; Figure 7) but not for sons ($\beta = .07, n.s.;$ Figure 8). Thus, H5 received partial support, indicated that satisfaction levels for parental cell phone usage are associated with rejection sensitivity only within paternal/daughter relationships. However, this relationship was positive, rather than negative as hypothesized, indicating potential suppression (see below).

H6 proposed that rejection sensitivity would be positively associated with PCPU. This association was significant within both maternal ($\beta = .31, p < .001$) and paternal ($\beta = .30, p < .001$) models (Figures 3 & 6). Thus, H6 was supported, suggesting that rejection sensitivity is positively associated with PCPU even after controlling for the behaviors of maternal and paternal caregivers.

H7 proposed that PCPU would be associated with an individual’s tendency to phubb others. This association was significant within both maternal ($\beta = .41, p < .001$) and paternal ($\beta = .41, p < .001$) models (Figures 3 & 6). Thus, H7 was supported, suggesting that PCPU is
positively associated with a tendency to phubb even after controlling for the behaviors of maternal and paternal caregivers.

H8 proposed that remembrances of parental phubbing would be positively associated with the child’s own phubbing behavior. This association was significant for maternal ($\beta = .24, p < .001$) relationships but not for paternal ($\beta = .13, n.s.$) relationships (Figures 3 & 6). However, when broken down into separate models based on the gender of the child, this association was only significant for maternal/son relationships ($\beta = .46, p < .001$; Figure 5). Thus, H8 received partial support, indicating that remembrances of parental phubbing were associated with the child’s tendency to phubb, but only in maternal/son relationships.

H9 proposed that satisfaction levels with parental cell phone usage would be negatively associated with the child’s own phubbing behavior as an adult. This association was significant for maternal ($\beta = .16, p = .018$) relationships but not for paternal ($\beta = .02, n.s.$) relationships (Figures 3 & 6). However, when broken down into separate models based on the gender of the child, this association was only significant for maternal/son relationships ($\beta = .18, p = .033$; Figure 5). Thus, H9 received partial support, indicating that satisfaction levels for parental phone usage were associated with the child’s tendency to phubb, but only in maternal/son relationships. This association was positive, rather than negative as hypothesized, again suggesting potential suppression.

**Suppression.** Before discussing these findings more generally, it is important to discuss suppression and its potential influence on each model. Occasionally, when analyzing mediated associations between variables, the introduction of one variable may enhance, eliminate, or reverse the association between other variables in a way that confounds their predictive capabilities (MacKinnon, Fairchild, & Fritz, 2007). In cases where mediation occurs, but the
mediating variable reverses or enhances the association between the predictor and the outcome variable, suppression may have occurred (Kenny, 2018). This occurs because the mediating variable increases the predictive validity of the other variables within the model (Mackinnon, Krull, & Lockwood, 2000).

To ease the interpretation of the aforementioned findings, it may be useful to consider satisfaction with parental phone usage as a suppressor variable. For example, the association between maternal phubbing and satisfaction with maternal phone usage was negative, as predicted. However, both maternal phubbing and satisfaction with maternal phone usage were positively associated with the son’s own tendency to phubb, even though we would expect the connection between satisfaction with maternal phone usage and child phubbing to be negative. Indeed, when tested alone, satisfaction with maternal phone usage had no effect on the son’s tendency to phubb ($\beta = -.09, n.s.$). In the case of those models listed above (see Figure 5), the effect of satisfaction with maternal phone usage on child phubbing ($\beta = .18$) is cancelled out by the effect of maternal phubbing on child phubbing ($\beta = .46$). This phenomenon may also explain the surprising positive associations observed between satisfaction with paternal phone usage, paternal satisfaction, and PCPU for daughters.

**Limitation of Data Analysis**

One important limitation should also be considered when interpreting results of Study 1 analyses. Specifically, this study utilized only those participants who reported being single. Research suggests that individuals who have had negative experiences with their caregivers have a difficult time creating and maintain relationships as an adult (Rohner & Lansford, 2017), thus, using only participants who were single may have sampled a population that is disproportionally sensitive to rejection.
Study 1 Discussion

Parents, and other primary caregivers, have always played a crucial role in child development because parent/child relationships create a foundation from which individuals compare and create future relationships. Findings from the present study confirm research suggesting that parental phone usage may influence not only the child’s own phone usage (Xie et al., 2019), but also the degree to which they feel accepted or rejected by their parents. Findings also confirm important proponents of interpersonal acceptance-rejection theory (Rohner, 2016). At least four implications can be drawn from recent findings.

First, as shown in previous research (Roberts & David, 2016), phubbing, or using one’s phone during face-to-face communication, is associated with a variety of negative relational outcomes. Perhaps most notable is that children who remember being phubbed by their parents also report lower levels of parental acceptance. This association may indicate that children interpret parental phone usage during face-to-face conversations as a sign of rejection. Although parents who phubb may not intend to communicate rejection, the more time parents spend on their devices while with their children decreases the likelihood that children will feel accepted. Parents should therefore be aware of the message that they may be sending, intentionally or otherwise, in order to improve communication within their relationship.

The connection between phubbing and acceptance, however, was mediated by satisfaction with parental phone usage. Importantly, this mediated effect suggests that phubbing itself might influence relationships differently depending upon individual attitudes and expectations for phone usage (Miller-Ott, Kelly, & Duran, 2017). Whereas previous work on phubbing has considered only the behavior itself, it may be that some individuals are less effected by phubbing directly, particularly if they are more satisfied with parental phone usage.
generally. Although it is important to continue to measure simple phone usage in order to
determine how behaviors affect large populations, it is also important to measure attitudes
toward phone usage to account for and explain individual idiosyncrasies.

Second, consistent with IPARTheory (Ibrahim et al., 2015), remembrances of parental
acceptance/rejection were indicative of children’s own sensitivity to rejection, at least within
father/son relationships. One major postulate of IPARTheory suggests that the warmth
dimension of parenting consists of behaviors that signal acceptance (e.g., kisses, hugs, and
compliments) or rejection (i.e., ignoring, showing indifference, or simply the lack of hugs and
kisses; Rohner, Khaleque, & Cournoyer, 2012). When children experience more rejection than
acceptance, they often develop a sensitivity to rejection, such that they begin to interpret the
behaviors of others as rejection even when those behaviors are not intended as such (Downey &
Feldman, 1996). Thus, at least in some cases, parental acceptance/rejection influences the child’s
future relationships by changing the way in which they communicate with others.

One reason this association was not present among father/daughter or mother/child
relationships may be due to the fact that only individuals who reported being single were
included in the present analysis. It may also be that sons are influenced by parental acceptance
more than daughters. For example, Ibrahim et al. (2015) noted stronger associations between
parental acceptance and rejection sensitivity among sons than among daughters. However,
because previous research has consistently shown strong association between parental
acceptance and rejection sensitivity for maternal/child and paternal/child relationships, future
research should examine these associations using a sample with more variance in terms of
recalled acceptance.
Third, rejection sensitivity plays a crucial role in the effect of parental behaviors on the child’s behaviors as an adult. Rosenbach and Renneberg (2014) noted that rejection sensitivity acts as a mediator between rejections that individuals experience as children and their actions/personalities as adults. Similarly, the present study showed that rejection sensitivity was the strongest predictor of the child’s problematic cell phone usage, which in turn predicted the child’s own tendency to phub others as an adult.

These associations suggest that individuals who are sensitive to rejection are more likely to use their cell phones in unhealthy ways. It may be that they do so because mediated communication offers more control and is less threatening than face-to-face communication (Bardi & Brady, 2010). This added control makes it easier for individuals to frame and interpret communication encounters in ways that signify acceptance, rather than rejection. Digital communication also makes it easier for individuals to access social groups that share similar values and ideologies. Thus, cell phones may offer rejection sensitives with a portal through which they may interact with accepting, rather than rejecting, conversation partners. However, such benefits may come at a risk to important face-to-face interactions.

Finally, individuals with high levels of PCPU are more likely to phubb conversation partners. This, alone, is an obvious result – the more an individual is addicted to their phone, the more likely they are to use their phone even when they shouldn’t. However, the potential relationship between parental phone usage and child phone usage again highlights the importance of proper cell phone usage among parents. Although previous work has uncovered a connection between parental phone addiction and child phone addiction (Konok, Bunford, & Miklosi, 2020), it was interesting to note that maternal phone usage was associated with son’s phubbing and that paternal phone usage was associated with daughter’s PCPU.
Taken together, findings highlight the critical influence of parental phone behavior on child development. As in other relationships, phubbing acts as a communication disruptor, particularly when conversation partners are dissatisfied with the way phones are used. Thus, even parents attempting to signal acceptance to their children might unintentionally be showing signs of rejection. This behavior, in turn, may also increase the likelihood that children will engage in harmful cell phone habits, causing them to miss out on other important benefits of cell phone technology.
Study 2: Partner Phubbing in Romantic Relationships

As indicated in Study 1, adult children who recall being phubbed by their parents are likely to engage in phubbing behaviors within their own adult relationships. It is therefore important to understand how phubbing acts as a nonverbal communicative cue to influence important romantic relationships. Thus, whereas, Study 1 examined how remembrances of parental phubbing influences the participant’s own phubbing behaviors as an adult, Study 2 examines how phubbing influences communication within adult romantic relationships. Specifically, this study will utilize developmental interactionist theory to examine phubbing as a nonverbal cue and its relation to emotional communication.

Developmental Interactionist Theory

Developmental interactionist theory (DIT; Buck, 1984, 1989, 1994) provides a useful framework for analyzing the effects of phubbing as a nonverbal communication behavior. DIT suggests that messages shared between individuals range from those that are entirely spontaneous to those that are primarily symbolic. Although all communication is spontaneous to some degree, not all communication is symbolic (see Figure 9). Symbolic communication depends upon meaning that has been socially constructed, whereas spontaneous communication relies upon innate biological reactions and interpretations of these reactions. DIT, therefore, considers communication to be an interaction between symbolic and spontaneous communication as individuals attempt to gain, create, and share meaning.

According to the theory, successful communication depends on individuals’ accuracy in sending (encoding) and receiving (decoding) both spontaneous and symbolic messages. DIT is particularly useful in explaining the way in which individuals utilize nonverbal cues (i.e., eye contact, smiling, frowning, etc.) to connect and create shared meaning with co-present others.
For the most part, the ability to send and receive nonverbal messages is developed innately through “biologically-based tendencies to ‘know’ directly the ‘meaning’ of displays,” known within the theory as “preattunements” (Buck, 1994, p. 267). However, individuals also, through the education of attention, develop individual tendencies to focus on some cues while ignoring others.

For example, DIT argues that spontaneous communication involves the use of facial and gestural displays, and preattunements to those displays, in order to create shared meaning between individuals (Buck, 1995). These facial displays can be intuitive (e.g., smiling when one is happy) or developed through social interaction (e.g., learning not to smile when something bad has happened to a friend even when the thing itself may appear humorous). Whereas spontaneous cues are innate, individuals can develop pseudospontaneous learned social responses that are developed over time (i.e., a child learning not to get frustrated when things do not go their way).

Important to this process is an individual’s ability to accurately decode both the spontaneous and symbolic messages received from communication partners. Even in controlled environments, this process can be difficult for a variety of reasons. One reason, pertinent to the present conversation, is the fact that individuals enter conversations with different attitudes, opinions, and life experiences, which in turn influence the individual’s focus during the conversation and may modify the way in which affective displays are attended to and therefore interpreted.

Perhaps because it is more readily manipulated, much of communication research focuses on symbolic communication. Yet, although spontaneous communication occurs naturally and is often subconscious, it is not inconsequential (Buck & VanLear, 2002). For example, an
individual may impulsively reach for their phone during a conversation even though they fully intended to continue listening to their conversation partner. Though they may be symbolically communicating that they are listening (e.g., verbal “uh-huh’s”, “yeah’s”, head nods, etc.) they could simultaneously be spontaneously communicating disinterest (e.g., pulling their phone closer or adjusting the phone in order to better see the screen). This spontaneous message, though unintended, is likely to have as great an impact upon the conversation as the intended symbolic messages.

Phubbing, the act of using one’s phone while with a conversation partner (Roberts & David, 2016), is itself a nonverbal cue that is likely to interfere with the encoding and decoding of other spontaneous signals. Within romantic relationships, phubbing has been connected to increased avoidance and separation (Zonash, Saghir, Ahsan, & Murtaza, 2020). Similarly, phone usage during dinner conversation has shown connection with higher reports of distraction and lower reports of intimacy between conversation partners (Abeele, Hendrickson, Pollmann, & Ling, 2019). Thus, phubbing is likely to disrupt the process of sending and receiving spontaneous cues, reducing conversationalists’ ability to connect with one another emotionally. This is particularly important for those within romantic relationships because the ability to successfully send and receive emotional messages has been linked to overall relationship satisfaction (Sabatelli, Buck, & Dreyer, 1982). Utilizing this framework set forth by DIT, Study 2 will therefore explore phubbing’s influence on relational satisfaction, nonverbal immediacy, and affect receiving ability (i.e., the ability to accurately decode nonverbal messages of emotion).

Relational Satisfaction. The negative association between phubbing and relational satisfaction has been well documented (Miller-Ott, Kelly, & Duran, 2012; Hall, Baym,
Miltner, 2014; Brown, Manago, & Trimble, 2016; McDaniel & Coyne, 2016; Roberts & David, 2016; Kelly, Miller-Ott, & Duran, 2017; Rotondi, Stanca, & Tomasuolo, 2017; Halpern & Katz, 2017). However, the influence of phubbing on communicative outcomes may vary depending upon individual and relational differences. Phubbing, for example, seems to be particularly harmful for individuals who hold negative perceptions of their own self-worth (Roberts & David, 2016), likely because these individuals have learned to look for and focus their attention upon behaviors that re-affirm their self-identity.

Similarly, Allred and Crowley (2017) found that individuals who were annoyed by the presence of a phone were also more likely to report that their partner’s phone was displayed during a conversation even when it was not and that phones impacted individual satisfaction levels differently depending upon the degree to which they found phone presence annoying. These differences likely occur because individuals have different attitudes concerning the appropriateness of cell phone usage (Miller-Ott, Kelly, & Duran, 2014). These findings suggest that the influence of a phone may depend upon the attitudes of the individual as much as upon the way in which it is used. Whereas some individuals find phone usage during face-to-face communication to be inappropriate, others may not. Thus, beyond simply measuring the way in which phones are used during face-to-face conversations (i.e., phubbing), it is important to also measure the degree to which individuals are satisfied with their partner’s phone usage (i.e., satisfaction with partner phone usage).

One purpose of phubbing research is to determine if specific phone behaviors consistently inhibit communication across relationships and contexts. For example, it has been suggested that consistently using a phone during face-to-face conversations leads to negative relational outcomes (Robert & Davids, 2016). Because phone usage during face-to-face
conversations incites feelings of neglect (Xie et al., 2019), it is likely that individuals who recall being phubbed by their partner will also be less likely to report being satisfied with the way in which their partner uses their phone generally. In turn, Miller-Ott et al. (2012), noted that satisfaction with partner phone usage is strongly associated with overall relationship satisfaction. It may be, therefore, that satisfaction towards partner cell phone usage mediates the association between actual phone usage (i.e., phubbing) and relational satisfaction.

H10: The association between perceptions of partner phubbing and relationship satisfaction is mediated by satisfaction with partner phone usage such that increases in partner phubbing are negatively associated with satisfaction with partner phone usage and satisfaction with partner phone usage is positively associated with relationship satisfaction.

Individuals also tend to differ in the degree to which they notice and are aware of phone usage. Abeele et al. (2019) noted that only about 75% of participants accurately recalled whether or not their conversation partners had a phone with them during a conversation that had taken place only moments before. To understand this phenomenon, we again draw from interpersonal acceptance-rejection theory (IPARTheory). Specifically, variance in rejection sensitivity, “hypervigilance and hypersensitivity to rejection by significant others” (Ibrahim, Rohner, Smith, & Flannery, 2015, p. 52), may explain why some individuals are more likely to recognize being phubbed.

Rejection sensitivity, for example, has been connected to feeling victimized (Gao, Assink, Liu, Ling Chan, & Ip, 2019) because individuals with high levels of rejection sensitivity have a tendency to attribute rejection as the intent to otherwise benign behaviors. As noted previously, DIT similarly suggests that individuals develop tendencies to focus on, or ignore,
certain messages during any given exchange through the education of their attention (Buck, 1994). Thus, one individual’s life experience may cause them to focus their attention fully on one aspect of a conversation whereas another individual may focus on an entirely different aspect. Again, this suggests that individuals who are more sensitive to rejection are more likely to recognize and focus on behaviors that validate their feelings of rejection.

It makes sense that individuals with higher levels of rejection sensitivity are more likely to recognize their partner’s phone usage as a nonverbal signal of rejection. Rejection sensitivity might therefore moderate the effects of phubbing on the degree to which an individual is satisfied with their partner’s phone usage. For example, individuals with more secure feelings about their relationships seem to be better able to frame phubbing in such a way that allows them to avoid truly feeling snubbed (e.g., ‘My partner phubbed me because they needed to answer an important phone call from their mother, not because they dislike me personally’; Roberts & David, 2016). Thus, because individuals with higher levels of rejection sensitivity are more likely to focus on exclusionary behaviors of others (i.e., hypervigilance) and to experience stronger reactions when rejection is perceived (i.e., hypersensitivity), it may be that rejection sensitivity intensifies the negative effects of phubbing.

H11: The mediated association between perceptions of partner phubbing, satisfaction with partner phone usage, and relationship satisfaction predicted in H10 is moderated by rejection sensitivity such that both the negative association between phubbing and satisfaction with partner phone usage and the negative association between phubbing and relationship satisfaction become stronger as rejection sensitivity increases.

Nonverbal Immediacy. Another individual variable that may influence the effects of phubbing within romantic relationships is that of immediacy. Immediacy is considered a central
component of successful communication (Andersen & Andersen, 2005), and is characterized by approach behaviors that signify that an individual is available and attentive during a conversation (Mehrabian, 1971). Specifically, immediacy is defined by behaviors that “signal availability, increase sensory stimulation, and decrease both the physical and psychological distance” between conversation partners (Andersen, Guerrero, Buller, & Jorgensen, 1998, p. 502; Andersen, 1985; Andersen & Andersen, 2005). Immediacy is often measured through observable nonverbal cues such as eye contact, hand gestures, body lean, head movement, and touch (Guerrero, 2005), as well as those behaviors that involve closing the physical distance between individuals (Argyle & Dean, 1965).

Importantly, immediacy behaviors lead to intimacy within interpersonal relationships (Argyle & Dean, 1965). Individuals use nonverbal immediacy cues in order to create, display, and maintain their desired level of intimacy, good or bad, within any given relationship. Once the desired level of intimacy has been achieved, individuals often compensate nonverbal behaviors to maintain equilibrium. For example, during conversations in which eye contact is not possible, individuals may increase their vocal expressiveness so that levels of intimacy remain at the desired level. Thus, intimacy is a function of immediacy such that desired levels of intimacy are obtained as immediacy cues are optimized or minimized strategically.

Because phubbing has been connected to avoidance behaviors (Panova & Lleras, 2016), it is important to consider how phubbing relates to perceptions of immediacy. The act of phubbing is likely to negatively impact perceptions of immediacy because individuals using a phone direct their eyes and hands towards the device, limiting their ability to look at, gesture towards, and touch conversation partners. Unless individuals compensate for this behavior by enhancing other immediacy cues, perceptions of immediacy are likely to drop, as evidenced by
the fact that individuals who use their cell phones during social interactions have been rated as less attentive (Seo, Park, Kim, & Park, 2016). It is therefore likely that partner phubbing will reduce perceptions of immediacy. However, because this study will focus only on perceptions of phubbing and immediacy, rather than actual phubbing and immediacy, it is important to also consider how satisfaction levels for partner phone usage influence immediacy. As noted previously, phubbing is likely to be negatively associated with satisfaction for partner phone usage because the invasive phubbing behavior contradicts expectations for attentiveness. In turn, satisfaction for partner phone usage may also be associated with perceptions of phubbing. This association is likely because the effects of cell phone usage seem to occur when individuals are dissatisfied with their partner’s phone usage, rather than simply because their partner was using a phone (Miller-Ott, et al., 2012). Individuals who recall being dissatisfied with their partners phone behaviors during a conversation are also likely to recall lower levels of immediacy. Thus, satisfaction levels for partner phone usage may mediate phubbing’s effect on immediacy.

H12: The association between perceptions of partner phubbing and immediacy is mediated by satisfaction with partner phone usage such that increases in partner phubbing are negatively associated with satisfaction with partner phone usage and satisfaction with partner phone usage is positively associated with perceptions of immediacy.

Importantly, previous research demonstrates a strong connection between perceptions of immediacy and satisfaction within a given relationship (Goodboy & McCroskey, 2008; Hinkle, 1999). However, the pilot study failed to replicate these findings. Failure to replicate in this case may have occurred simply because the pilot study was not sufficiently powered to detect an otherwise present relationship. Alternatively, the measure used within pilot testing may not have been reliable enough to accurately portray immediacy behaviors. Still, it may be that changes in
social norms that have accompanied the availability of cell phone technology have also changed individual expectations for nonverbal immediacy during conversations. That is, the connection between immediacy and satisfaction may have decreased as individual expectations for undivided attention have been reduced. Conversely, it may suggest that the way in which individuals communicate attentiveness during a face-to-face conversation has changed such that traditional measures of immediacy no longer reflect behaviors that are important to satisfaction. The following relationships are therefore proposed as research questions:

RQ2: Are perceptions of immediacy positively associated with relational satisfaction?

RQ3: Do perceptions of immediacy mediate the connection between satisfaction with partner phone usage and relational satisfaction?

Affect Receiving Ability. Whereas the burden of immediacy often falls upon the sender, at least one aspect of immediacy depends upon the communicative skill of the receiver. As postulated by DIC, receivers must be able to accurately determine if the sender is attentive because it is the correct assessment between actual and perceived attentiveness that allows individuals to enjoy a shared psychological state. As noted previously, those who are emotionally expressive make it easier for their conversation partners to empathize and experience similar emotions (Kring, Smith, & Neale, 1994). Yet, individuals who are not emotionally expressive may also display nonverbal cues related to immediacy, but in ways that are more subtle. For these individuals, conversation partners must be better adept at decoding these subtle messages appropriately. Thus, an individual’s affective receiving ability, or their ability to recognize and interpret the emotions of others (Buck, 1976; Buck, Miller, & Powers, 2017), may also influence perceptions of immediacy.
Affect receiving ability (ARA) is often divided into two sub-categories (see Buck, Graham, Allred, & Hancock, 2020). The first involves simply an individual’s ability to accurately interpret another’s nonverbal expressions in order to determine which emotion the other is experiencing (i.e., emotional empathy). The second is more complex, and requires the ability to know whether the other is displaying spontaneous or manipulated emotion (i.e., cognitive empathy). Manipulated emotions may be posed (i.e., displaying nonverbal cues connected to an emotion without feeling the emotion itself) or regulated (i.e., experiencing an emotion, but intentionally changing one’s nonverbal cues in order to mask the presence of the emotion). Both emotional and cognitive empathy allow individuals to more successfully navigate face-to-face interactions.

Specifically, individuals who are better at recognizing the emotional expressions of their partner should also be better at recognizing nonverbal immediacy, even when such cues are not obvious to others. As noted previously, romantic partners tend to be better at recognizing their partner’s emotions than other people would be (Sabatelli, Buck, & Dreyer, 1982). It makes sense, then, that individuals with high ARA would be better attuned to immediacy cues when such cues are present and also better attuned to recognizing when such cues are not present. It is therefore likely that ARA moderates the relationship between phubbing and immediacy such that the negative relationship becomes stronger when ARA is high.

It is important to note that, whereas the pilot test found a significant negative relationship between ARA and immediacy, ARA did not moderate the effects of cell phone presence on immediacy. However, this may simply be because the mere presence of a phone simply had no effect on immediacy. Phubbing, a much more invasive nonverbal cue, is likely to impact perceptions of immediacy enough to allow for additional moderation tests. Thus, ARA is
proposed as a potential moderator of the effects of phubbing on perceptions of immediacy (Note: hypothesized paths for Study 2 may be viewed on Figure 10).

H13a, b: The relationship between phubbing and perceptions of immediacy is moderated by (a) emotional empathy and (b) cognitive empathy, such that the negative relationship between phubbing and immediacy is stronger when empathic ability is higher.

**Study 2 Methods**

**Sample**

After receiving approval from the Institutional Review Board (IRB), participants were recruited from a large Northeastern university in the United States as part of a larger study investigating phubbing in both parent-child and romantic relationships. Recruitment for this study also targeted students in an introductory communication course and offered research course credit for participation (i.e., participation took between 10-20 minutes and equated to 10 points of course credit). However, participants who took part in the larger study, but were not in a current romantic relationship (N = 262) were not used within the present study.

The present study, therefore, consisted of only those participants who reported being in a current romantic relationship (N = 139). Consistent with this process, this sample also included a mix of female (58.3%) and male (41.7%) participants, with some diversity in terms of race: white (65.5%), Asian/Pacific Islander (18.7%), Latinx (8.6%), Black/African American (5.0%), Native American (.7%), Hindu (.7%), and Biracial (.7%). Participants were required to be over the age of 18 (M = 19.34, SD = 1.34).

G*Power was used to determine the sample size needed to achieve appropriate power based on previously determined and predicted effect sizes. The smallest effect size of phubbing previously noted was .15 (Wang et al., 2017), and it was expected that this would be the smallest
effect size of the current study. Thus, to achieve power of .95 with an Alpha of .05 using a one-tailed test and up to five predictors, the suggested sample size is 204 participants to detect medium to small effects. Because recruiting techniques failed to achieve the desired sample, a post-hoc power analysis was run. This post-hoc analysis found that the actual sample size of 139 participants was adequate to achieve power of .81 for detecting small to medium effects (i.e., $f^2 = .10$) with up to 5 predictors.

**Procedure**

The procedure for this study mirrored the procedure found in Study 1: a cross-sectional survey administered via Qualtrics to interested individuals. Participants were first asked to report their relationships status and, if in a current romantic relationship, were then asked questions related to partner phubbing, satisfaction with phone usage, partner immediacy, rejection sensitivity, relationship satisfaction, and affect receiving ability. Upon completing the survey, participants were thanked for their responses and redirected to a separate Qualtrics survey hosted by the instructor of the introductory communication course where they were provided research credit.

The same manipulation check was again employed to increase the quality of data. Participants were provided with a simple definition of phubbing (i.e., the act of snubbing conversation partners by focusing on one’s cell phone rather than the conversation; Robert & Davids, 2017). Participants were then provided two scenarios (i.e., ‘You and your friend are in the middle of an important conversation when your friend becomes distracted by their phone and stops talking to you, focusing instead on their phone’ and ‘You are telling your friend a story and they put their phone into their pocket in order to pay attention to what you are saying’) and asked
to identify which scenario represented phubbing behavior. Nineteen individuals were disqualified from participation due to incorrectly answering this question.

**Measures**

**Perceptions of Partner Phubbing.** Partner phubbing was measured using Roberts and David’s (2016) 9-item phubbing scale. Participants were asked to report partners’ cell phone behaviors on a scale of 1-7 where 1 = ‘Almost Never’ and 7 = ‘Almost Always.’ Items included: “During a typical mealtime that my partner and I spend together, my partner pulls out and checks his/her phone,” “My partner places his or her cell phone where they can see it when we are together,” “My partner keeps his or her cell phone in their hand when he or she is with me,” “When my partner’s cell phone rings or beeps, he/she pulls it out even if we are in the middle of a conversation,” “My partner glances at his/her phone when talking to me,” “During leisure time that my partner and I are able to spend together, my partner uses his/her phone,” “My partner does not use his or her phone when we are talking,” “My partner uses his or her cell phone when we are out together,” and “If there is a lull in our conversation, my partner will check his or her cell phone.” After reverse scoring items indicated in italics, scores were averaged such that they ranged from 1-7 with higher scores representing greater degrees of phubbing. This scale was reliable (α = .87, M = 3.35, SD = 1.10).

**Satisfaction with Partner Phone Usage.** Satisfaction with partner cell phone usage was measured using Miller-Ott et al.’s (2012) 7-item cell phone satisfaction scale. Participants were asked to report their satisfaction with partners’ cell phone behaviors on a scale of 1-7 with 1 = Disagree Completely and 7 = Agree Completely. Items included: “I am happy with the use of cell phones in our relationship,” “Our use of phones is fine,” “Cell phones are a source of conflict in our relationship,” “We have arguments over how we use the cell phone,” “I am
satisfied with the way my partner and I use cell phones in our relationship,” “A lot of our relationship arguments are about the use of our cell phones,” and “I’d like to change some things about our use of cell phones with each other.” After reverse scoring items indicated in italics, scores were averaged with higher scores representing greater levels of satisfaction with the use of cell phones in the relationship. This scale was reliable ($\alpha = .90$, $M = 4.54$, $SD = .90$).

**Perceptions of Immediacy.** Because the 11-item Andersen and Andersen (1979) Behavioral Indicate of Immediacy scale used in pilot testing did not measure immediacy as expected, it was important to find a newer measure of immediacy that would more accurately measure perceptions of actual immediacy rather than deviations in immediacy. Perceptions of immediacy were therefore measured using 13 items adapted from Richmond, McCroskey, and Johnson’s (2003) scale. This scale has shown consistent reliability ($\alpha \geq .80$; Richmond et al., 2003). Participants were asked to report partners’ immediacy behaviors on a scale of 1-7 where 1 = ‘Almost Never’ and 7 = ‘Very Often.’ Items included: “My partner uses their hands and arms to gesture while talking to me,” “My partner touches me on the shoulder or arm while talking to me,” “My partner uses a monotone or dull voice while talking to me,” “My partner looks over or away from me while talking to me,” “My partner moves away from me when I touch them while we are talking,” “My partner has a relaxed body position when she/he talks to me,” “My partner smiles when talking to me,” “My partner avoids eye contact when talking to me,” “My partner has a tense body position when talking to me,” “My partner sits close or stands close to me while talking to me,” “My partner uses a variety of vocal expressions when talking to me,” “My partner is animated when he/she talks to me,” and “My partner leans toward me when talking to me.” After reverse scoring items indicated in italics, scores were averaged with higher scores
representing stronger reports of immediacy. This scale was reliable \((\alpha = .82, M = 5.82, SD = .70)\).

**Relational Satisfaction.** Relational satisfaction was measured using Hendrick’s (1988) 7-item scale. Participants were asked to report their satisfaction with their relationship on a scale of 1-7 with 1 = ‘Not At All’ and 7 = ‘Very Much.’ Items included: “How well does your partner meet your needs?,” “In general, how satisfied are you with your relationship?,” “How often do you wish you hadn’t gotten into this relationship?,” “How good is your relationship compared to most?,” “To what extent has your relationship met your original expectations?,” “How much do you love your partner?,” and “How many problems are there in your relationship?.” This measure was chosen because it has consistently been used in previous research connecting PCPU to relational satisfaction (Hall, Baym, & Miltner, 2014; Miller-Ott, Kelly, & Duran, 2012). After reverse scoring items indicated in italics, scores were averaged with higher scores representing greater levels of relationship satisfaction. This scale was acceptably reliable \((\alpha = .79, M = 5.97, SD = .78)\).

**Affect Receiving Ability/Empathy.** Affect receiving ability, for both emotional and cognitive empathy, was measured using Buck’s (2017) Communication of Affect Receiving Ability Test. In this measure, participants were tested on two different tasks: CARAT-S and CARAT SPR. In the CARAT-S, which measures emotional empathy, participants were shown 24 six second video clips of others who are experiencing different emotions. Participants were asked to determine if individuals in each clip were experiencing a positive, negative, or neutral emotion. In the CARAT-SPR, which measures cognitive empathy, participants were shown 26 six second videos of others who were asked to respond to emotionally charged images spontaneously (i.e., spontaneous), to pose as if seeing an emotionally charged image when none
is present (i.e., planned), or to pose as if seeing an emotionally charged image while an image of the opposite valence was actually present (i.e., regulated). Participants were then asked to determine if each clip showed a spontaneous, planned, or regulated emotion. Participants received a score based on the number of clips that they rated correctly. This form of analysis has shown significant correlation with other measures that demonstrate ability to recognize the emotions of another individual (Boone & Buck, 2004). Participants received a percentage score depending upon the number of items they accurately match with the appropriate answer. That is, each item has a single correct answer and participants received 1 point for each correct answer. For emotional empathy, scores ranged from .63 to 1.0 (i.e., 63%-100% correct; M = .94, SD = .08, α = .51). For cognitive empathy, scores ranged from .19 to .77 (M = .45, SD = .11, α = .67). For each measure, higher scores represented higher levels of affect receiving ability. Although reliability fell below generally accepted levels, such reliabilities are not uncommon for measures of emotion recognition, perhaps because the ability to read one type of emotion may not reflect the ability to read another type of emotion. Additionally, because this measure did not use Likert-type items, but instead used indexes with right or wrong answers (Crossman, 2019), Cronbach’s alpha may not be representative of the relative value of the measure. 

**Rejection Sensitivity.** Rejection sensitivity was measured using the 13-item Interpersonal Rejection Sensitivity Scale (IRSS; Rohner, Molaver, & Ali, 2018). This measure was used as it is described earlier within Study 1, and was again reliable (α = .91, M = 2.76, SD = .56).

**Study 2 Results**

Data were first checked for normal distributions to ensure appropriateness in terms of skewness and kurtosis (< 3 and < 10, respectively; Kline, 1998). Because each measure fell within
acceptable ranges, and no evidence of multicollinearity emerged between key study variables (see Table 4), scales were used as proposed. Scores for each scale were calculated by averaging or summing scale items such that each participant received a single composite score for each measure.

Because this data set contained no missing data, demographic variables were then checked against study variables for consideration as covariates. As noted in Study 1, sex and age have been shown to influence the effects of phubbing on relational outcomes (Ibrahim et al., 2015; Guazzini et al, 2019). Linear correlations were utilized to determine if sex, age, or age at which the individual owned their first phone were significantly correlated with any outcome variable. Any demographic with significant correlation was tested as a potential covariate within the respective model.

Sex was positively correlated with rejection sensitivity \((r(139) = .24, p = .005)\), such that female participants reported higher levels of rejection sensitivity. Age of participant was positively correlated with partner phubbing \((r(139) = .24, p = .005)\), such that older participants reported higher levels of partner phubbing. Age of participant was also negatively correlated with satisfaction with partner phone usage \((r(139) = -.32, p < .001)\), such that older participants were also less likely to be satisfied with their partner’s phone usage. The age at which participants owned their first phone was not significantly correlated with any outcome variable.

**Hypothesis Testing.** The following hypothesis were tested using Hayes’ (2013) Process Macro for SPSS. This analysis utilizes a 95% bias corrected confidence interval (CI) and 5000 bootstrapped resamples. Hypotheses testing mediation was completed using Model 4. Hypotheses testing moderation was completed using Model 1.

H10 proposed a negative association between perceptions of partner phubbing and relationship satisfaction that is mediated by satisfaction with partner phone usage. Within the
model, partner phubbing was entered as the independent variable, relationship satisfaction was entered as the dependent variable, and satisfaction with partner phone usage was entered as the mediating variable. Findings indicate that the indirect effect was significant (95% CI = [-.42, -.21], \( p < .001; \beta = -.31, SE = .08 \)). The total effect was also significant (95% CI = [-.38, -.06], \( p = .008; \beta = -.22, SE = .08 \)), but the direct effect was not (95% CI = [-.09, .26], n.s.). The significant indirect effect, along with the non-significant direct effect, suggests that satisfaction with partner phone usage fully mediates the association between partner phubbing and relationship satisfaction. H10 was therefore supported (for complete model output, see Table 6).

H11 proposed that the mediated path proposed in H10 would be moderated by rejection sensitivity. Within the model, partner phubbing was entered as the independent variable, relationship satisfaction was entered as the dependent variable, satisfaction with partner phone usage was entered as the mediating variable, and rejection sensitivity was entered as the moderating variable. Findings indicate that the interaction effect between phubbing and rejection sensitivity was not significant for satisfaction with partner phone usage (95% CI = [-.14, .12], \( \beta = -.01, n.s. \)) or relationship satisfaction (95% CI = [-.18, .128, \( \beta = -.001, n.s. \))), therefore rejection sensitivity did not moderate the effect of partner phubbing on satisfaction with partner phone usage. H11 was not supported (see Table 7).

H12 proposed a negative association between perceptions of partner phubbing and immediacy that is mediated by satisfaction levels for partner phone usage. Partner phubbing was entered as the independent variable, immediacy was entered as the dependent variable, and satisfaction with partner phone usage was entered as the mediating variable. Findings indicate that the indirect effect was significant (95% CI = [-.43, -.22], \( p < .001; \beta = -.32, SE = .06 \)). The total effect was also significant (95% CI = [-.40, -.07], \( p = .006; \beta = -.23, SE = .08 \)), but the
direct effect was not (95% CI = [-.08, .26], n.s.). These findings suggest that satisfaction with partner phone usage fully mediates the negative relationship between partner phubbing and partner immediacy. H12 was therefore supported (see Table 8).

RQ2 explored the potential positive association between partner immediacy and relationship satisfaction, was tested using linear regression. Results indicate that partner immediacy significantly predicted change in relationship satisfaction ($F(1,137) = 57.67, < .001$), suggesting a positive association ($\beta = .54, t(138) = 7.59, SE = .07$). Partner immediacy explains a significant proportion of the variance in relationship satisfaction ($R^2 = .30$). Findings from RQ2 contradict findings from pilot testing, but reaffirm previously literature suggesting that immediacy is positively associated with relationship satisfaction.

RQ3 explored immediacy as a potential mediator between satisfaction with partner phone usage and relationship satisfaction. Satisfaction with partner phone usage was entered as the independent variable, relationship satisfaction was entered as the dependent variable, and immediacy was entered as the mediating variable. Findings indicate that the indirect effect (95% CI = [.11, .31], $p < .001; \beta = .20, SE = .05$), the total effect (95% CI = [.36, .65], $p < .001; \beta = .50, SE = .07$), and the direct effect (95% CI = [.13, .46], $p < .001; \beta = .23, SE = .08$) were all significant. Findings from RQ3 suggest that perceptions of partner immediacy partially mediate the relationship between satisfaction with partner phone usage and relationship satisfaction.

H13a proposed that the negative association between partner phubbing and immediacy is moderated by emotional empathy. Partner phubbing was entered as the independent variable, immediacy was entered as the dependent variable, and emotional empathy was entered as the moderating variable. Findings indicate that the interaction effect was not significant (95% CI = [-}
.08, .24], β = .08, n.s.), therefore emotional empathy did not moderate the effect of partner phubbing on perceptions of partner immediacy. H13a was not supported (see Table 9).

H13b proposed that the negative association between partner phubbing and immediacy is moderated by cognitive empathy. Partner phubbing was entered as the independent variable, immediacy was entered as the dependent variable, and cognitive empathy was entered as the moderating variable. Findings indicate that the interaction effect was not significant (95% CI = [-.10, .24], n.s.), therefore cognitive empathy did not moderate the effect of partner phubbing on perceptions of partner immediacy. H13b was not supported (see Table 10).

**Post-hoc Model Testing.** Because moderating variables did not interact as predicted, but were still associated with other key variables, it was important to explore other potential relationships. For example, it seemed appropriate to test the association between rejection sensitivity and partner phubbing in case the relationship may be explained by the fact that those who are more sensitive to rejection are simply more likely to report being phubbed. Additionally, affect receiving ability (both emotional and cognitive empathy) showed strong positive correlations with satisfaction with partner phone usage, and including these relationships may account for variance within the overall model.

Thus, to test these relationships holistically, a single model was tested using path modeling with maximum likelihood estimation in AMOS 22.0 software. Continuous variables (i.e., rejection sensitivity, partner phubbing, satisfaction with partner phone usage, immediacy, relationship satisfaction, emotional empathy, and cognitive empathy) were standardized to improve interpretability, whereas sex was effects coded (i.e., male = -1, female = 1).

The model chi-square, comparative fit index (CFI), and root mean squared error of approximation (RMSEA) were used to test for goodness of fit. A priori criteria were set as χ2/df
< 3.00, CFI > .90, and RMSEA < .05 (Browne & Cudeck, 1993; Kline, 1998). A fully saturated model was tested before analyzing hypothesized models. All non-significant non-predicted paths were then removed and the model was tested as hypothesized. Based on findings from hypothesis testing above, the proposed relationships were as follows: (1) rejection sensitivity would be positively associated with partner phubbing, (2) partner phubbing would be negatively associated with satisfaction with partner phone usage, (3) satisfaction with partner phone usage would be positively associated with both relationship satisfaction and partner immediacy, (4) immediacy would be positively associated with relationship satisfaction, and (5) both emotional and cognitive empathy would be associated with satisfaction with partner phone usage.

The hypothesized model demonstrated appropriate goodness of fit ($\chi^2$/df = 1.01, CFI = .999, and RMSEA = .007), and individual paths were assessed for significance and effects levels (see figure 11). Findings suggested that rejection sensitivity was positively associated with partner phubbing ($\beta = .25$, $p = .002$), after controlling for the influence of age on phubbing ($\beta = .23$, $p = .004$). Partner phubbing was negatively associated with satisfaction with partner phone usage ($\beta = -.52$, $p < .001$), after controlling for the influence of age ($\beta = -.18$, $p = .008$), emotional empathy ($\beta = .17$, $p = .011$), and cognitive empathy ($\beta = .19$, $p = .004$). Satisfaction with partner phone usage was positively associated with partner immediacy ($\beta = .52$, $p < .001$). Finally, immediacy was positively associated with relationship satisfaction ($\beta = .29$, $p < .001$) after controlling for satisfaction with partner phone usage ($\beta = .30$, $p < .001$).

Because sex differences for rejection sensitivity emerged (see Table 5), two additional models were analyzed, and important differences again appeared between female and male participants. The first model utilized only responses from female participants and achieved appropriate overall goodness of fit (see Figure 12; $\chi^2$/df = .74, CFI = 1.00, and RMSEA < .001).
For female participants, rejection sensitivity was not associated with partner phubbing ($\beta = .21, p = .057$). Partner phubbing was negatively associated with satisfaction with partner phone usage ($\beta = -.56, p < .001$), after controlling for the influence of age ($\beta = -.09, n.s.$), emotional empathy ($\beta = .08, n.s.$), and cognitive empathy ($\beta = .21, p = .018$). Satisfaction with partner phone usage was positively associated with partner immediacy ($\beta = .56, p < .001$). Finally, immediacy was positively associated with relationship satisfaction ($\beta = .36, p < .001$) after controlling for satisfaction with partner phone usage ($\beta = .37, p < .001$).

The final model utilized only responses from male participants and achieved appropriate overall goodness of fit (see Figure 13; $\chi^2$/df = 1.13, CFI = .97, and RMSEA = .048). For male participants, rejection sensitivity was positively associated with partner phubbing ($\beta = .32, p = .004$). Partner phubbing was negatively associated with satisfaction with partner phone usage ($\beta = -.45, p < .001$), after controlling for the influence of age ($\beta = -.25, p = .018$), emotional empathy ($\beta = .28, p = .004$), and cognitive empathy ($\beta = .20, p = .042$). Satisfaction with partner phone usage was positively associated with partner immediacy ($\beta = .48, p < .001$). Finally, immediacy was positively associated with relationship satisfaction ($\beta = .44, p < .001$), but satisfaction with partner phone usage was not associated with relationship satisfaction ($\beta = .22, n.s.$).

**Limitation of the Analyses**

One quick limitation that is important to consider here is that sampling from this study may not reflect general populations. Specifically, romantic relationships among college students tend to vary from those that exist in the general public. For example, Kamp Dush, Taylor, and Kroeger (2008) noted that relationship satisfaction varies across life stages, even for individuals who stay with a consistent partner. However, relationships in the present study may still reflect
the experiences of a large number of adults who are or will be college students in the United States.

**Study 2 Discussion**

Communication is the tool through which relationships are developed, but face-to-face communication is often stifled by internal and external distractions that limit participants’ ability to send and receive accurate messages. Phubbing is particularly detrimental to romantic relationships because it introduces both internal and external distractions. Findings from the present study show at least one pathway through which phubbing inhibits relational development.

First, individuals who report having partners that use phones during face-to-face conversations report significantly lower levels of relational satisfaction. One reason this occurs may be that phubbing incites jealousy (Krosnova, Abramova, Notter, & Baumann, 2016), which in turn decreases relationship cohesion. Phubbing causes partners to feel snubbed and ignored in a way that reduces their relational connection. However, research also suggests that individuals who phubb conversation partners are likely to be phubbed but their partners and individuals eventually begin to perceive phubbing as normative (Chotpitayasunondh & Douglas, 2016). Thus, phubbing is likely reciprocated within romantic relationships as individuals spiral in retaliatory behaviors, leading to lower levels of overall satisfaction.

Perceptions of immediacy may also help to explain why inappropriate phone usage leads to negative relational outcomes. Specifically, individuals who phubb their partners are less capable at utilizing nonverbal cues of immediacy, which are important for face-to-face communication. This association is again mediated by satisfaction with partner phone usage, suggesting that individual attitudes toward phone usage play an important role in how phones
influence relationships. Immediacy, in turn, partially mediates the association between phone satisfaction and relationship satisfaction for women, and fully mediates the association for men. This finding reaffirms previous literature suggesting the importance of nonverbal immediacy and suggests that contrary findings from pilot testing are likely due to measurement error. Immediacy, itself, remains a useful tool for relational communication because it increases the ability to relate to and understand conversation partners (Frymier, Goldman, & Claus, 2019). Individuals seeking to develop and adopt new technologies (i.e., cell phones, smart watches, etc.), should also consider their appropriate usages in order to successfully adopt behaviors that enhance communication while avoiding behaviors that detract from relational development.

Another important finding suggests that individuals who are highly sensitive to rejection are also more likely to report having been phubbed by their partner. This association may be explained in two ways. Perhaps because rejection sensitive individuals are hypervigilant in their efforts to detect signs of rejection (Ibrahim et al., 2015), these individuals may be better at recognizing when they are phubbed or they may recall being phubbed even when phubbing did not occur. For example, Allred and Crowley (2017) noted that individuals who reported general annoyance with cell phone technology were also more likely to report that a phone was present during a conversation even when it was not. Rejection sensitivity may similarly influence recollections of phubbing within romantic relationships such that increased rejection sensitivity coincides with increased recollections of phubbing.

Conversely, it may be that constant partner phubbing, which signals some form of rejection, caused romantic partners to develop greater sensitivity to being rejected. Similar to the association observed between childhood experiences of rejection and rejection sensitivity (Rosenbach & Renneberg, 2014), it may be that adults internalize being rejected by their partners
in a way that increases their attunement towards being rejected. Likely, the association between rejection sensitivity and partner phubbing is reciprocal, but directionality must be tested using experimental and/or longitudinal approaches.

Interestingly, the connection between rejection sensitivity and partner phubbing was stronger for male participants. Ivanova et al., (2020) also noted sex differences with phubbing behavior, specifically showing that the connection between depression and phubbing was stronger for male participants, arguing that men were more obsessive causing the effects to be stronger. However, many studies have not tested for gender effects, and those that have did not show significant effects (i.e., Karadağ et al., 2015; Chotpitayasunondh & Douglas, 2016). Further testing is needed to explain how and why phone usage effects women and men differently.

Finally, affect receiving ability played a smaller role within the overall model than expected. Still, that emotional and cognitive empathy were positively associated with satisfaction with partner phone usage suggests that the ability to recognize the emotions of others provides individuals with the capacity to understand what others are experiencing. Individuals who are better at understanding the emotions of others are more likely to be forgiving of partners’ offensive behavior (Cornish, Guyll, Wade, Lannin, Madon, & Chason, 2018). In the same way, empathic partners may be more satisfied with their partners’ phone usage because they understand their partners’ emotions to a greater degree. Individuals may also recognize that they, themselves, are not perfect in their application of phone usage, and are therefore more satisfied with the way in which their partner uses a phone.

Overall, findings support the assumption that using cell phones during conversations with a romantic partner is inadvisable. In relation to DIT, findings suggest that, although technology
is changing nonverbal behaviors, nonverbal signaling remains an important aspect of relationship development. Phubbing sends a nonverbal signal of rejection and inhibits the transfer of other important nonverbal cues. Individuals should be cautious with their cell phone usage, particularly while interacting with co-present others.
General Discussion & Conclusion

Cell phones have influenced nearly every aspect of human communication, including face-to-face conversations. One recent study noted that addiction to one’s cell phone may cause an individual to experience greater levels of anxiety, which in turn decreases their desire to communicate face-to-face (Allred & Atkin, 2020). Similarly, the overarching goal of this study was to better understand additional ways in which cell phones influence face-to-face communication. Specifically, pilot testing explored the influence of simply having a phone visible during a single, experimental, conversation. Conversely, Study 1 and Study 2 sought to understand why individuals phubb within their parent/child and romantic relationships and how phubbing affects perceptions within these relationships. Studies 1 and 2, importantly, reflect perceptions of phubbing across the span of the relationship, rather than during a single conversation. This difference is important to note because such perceptions may be influenced by a variety of unmeasured variables. For example, individuals who feel that their partner does not promptly respond to text messages may report feeling less satisfied with their partner’s phone usage. Emotions caused by this connection may, in turn, influence their gestalt impression of their partner’s phone usage such that they are more likely report being phubbed. Still, taken together, pilot testing and Studies 1 and 2 offer important insight concerning the influence of cell phone usage on communication.

Pilot testing, which did not support the ‘mere presence’ hypothesis (Przybylski & Weinstein, 2013), confirmed other more recent studies indicating that cell phone presence alone had no impact on conversation satisfaction (Crowley et al., 2018). Perhaps because of the increased access to cell phones, general expectations towards cell phone presence during conversations have likely changed over recent years such that phone presence is normative and
no longer seen as offensive. Many individuals have begun to view their phones as an extension of themselves (Park & Kaye, 2018), to the degree that it is unimaginable to go anywhere without it. Given these perceptions, younger individuals are likely to expect phone presence, rather than phone absence, and are therefore not disappointed when conversation partners also have their phones readily available. Additionally, individuals seem more aware of social demands for constant availability, making absent-presence (Gergen, 2002) a more common experience. Therefore, the ‘mere presence’ hypothesis, which previously claimed that phone presence has a negative impact on communication, no longer accurately portrays human experience. However, the constant presence of cell phones makes it increasingly likely that individuals will be tempted to use them, even during important conversations with family and friends.

Pilot testing highlighted one additional aspect concerning cell phones – that individuals are not good a recalling whether or not a cell phone was present during even those conversations which took place only moments before. Because both Study 1 and Study 2 utilized participant recollections of phone usage during conversations with their parents or romantic partners, it is likely that participant recollections vary from their actual experiences. This highlights the importance of perception during face-to-face conversations. For example, DIT suggests that successful communication occurs as individuals interpret the spontaneous and symbolic messages portrayed by their conversation partners. Interpretation of these messages is influenced by the perceptions, attitudes, and previous experiences of the decoder which cause them to focus on different encoded messages (Buck, 1995). As noted in the present study, individuals with higher levels of rejection sensitivity are more likely to focus on and interpret behaviors as being intentionally rejection oriented. It is possible that many other individual variables change the individual’s focus during face-to-face interactions. Thus, an individual, who for whatever reason
dislikes phone usage. may be more likely to recall being phubbed even when they were not as evidenced by the fact that individuals with high rejection sensitivity were more likely to report being phubbed by their partner in Study 2. Thus, despite their partner’s attempts to be attentive during the conversation, the success of the encounter may depend upon factors outside of the control of the partner.

However, despite individual differences and even though phone presence and usage during conversations are now seen as normative (Aagaard, 2019), phubbing is generally considered to be inappropriate (Schneider & Hitzfeld, 2019). In study 2, phubbing was shown to indirectly reduce perceptions of immediacy, perhaps causing conversation partners to feel that they are less important. Findings from the study 1 suggest parental phubbing may have particularly negative effects on child development, causing children to feel less accepted by their parents and increasing the likelihood that the children will also engage in unhealthy phone behaviors. Phubbing, therefore, acts as an indication of rejection and, when repeatedly done in relationships causes relational partners to feel excluded from the relationship. Because children rely on their relationships with primary caregivers to gain a sense of self and to understand their relationships with others (Konok, Bunford, & Miklosi, 2020), parental phubbing is likely to have long-lasting effects.

For example, parental phone behaviors seem to be predictive of children’s own phone usage. Parents who phubb their children may be increasing the likelihood that their children develop addictions to cell phones. Such addictions not only lead to phubbing in adult relationships in Study 1, but have also shown positive associations with anxiety and depression (Vahedi & Saiphoo, 2018). Parental phubbers may be instigating unhealthy patterns that their children follow, reducing the otherwise positive effects of such technological advances.
Specifically, males seemed to be influenced by the phone behaviors of their maternal caregiver and females seemed to be influenced by the phone behaviors of their paternal caregiver, suggesting that females and males differ in their experiences with and reactions to being phubbed, at least in relation to childhood caregivers.

This may also indicate differences in the ways that female and male participants interpret interactions with technology. For example, T’ng, Ho, and Low (2018) found that slight differences in the Big Five personality traits between female and male participants lead to different effects in terms of phubbing. Future research that explains why these differences emerged will better help individuals to prepare for interactions in parent/child and romantic relationships.

Findings from Study 1 do suggest that there may be limitations to the basic assumptions of IPARTheory. The theory suggests that recollections of parental acceptance lead to reduced levels of rejection sensitivity. However, findings suggested that this association was only true for paternal/daughter relationships. This is an interesting finding, considering that Ibrahim et al, (2015) noted that the connection between parental acceptance was stronger for the participants same-sex parental figure (note; Ibrahim et al. used the full version of the PARQ, whereas the present study used the shortened version). Such differences suggest that there may be important unmeasured interaction variables that influence the association between parental acceptance and rejection sensitivity. As these variables are discovered and included within the theory, IPARTheory will be better able to explain when and why parental acceptance affects rejection sensitivity.

Although parental phone usage had no impact on rejection sensitivity, it is clear that rejection sensitivity is highly associated with problematic cell phone usage. This may occur
because rejection sensitive individuals seek out mediated communication, rather than face-to-face communication, because it is less intimidating and offers more control over their communicative choices (Bardi & Brady, 2010). It is possible that these individuals unintentionally phubb co-present others because of their addiction to their devices. It may also be that they care less about face-to-face communication and cognitively choose to focus instead on improving digital relationships. However, this finding was only found in a sample entirely comprised of single participants. It would be interesting to see how these associations carry over to romantic relationships.

Within romantic relationships, immediacy played an important role in how phone usage influenced overall satisfaction. Indeed, for female participants, perceptions of immediacy partially mediated the association between satisfaction with partner phone usage and relationship satisfaction. For male participants, immediacy fully mediated this association. In line with previous research (Richmond & McCroskey, 2000), immediacy was positively associated with relationship satisfaction. Findings from the present study, though, indicate that satisfaction for partner phone usage, and therefore phone usage itself, may influence perceptions of immediacy.

Thus, phone usage seems to inhibit nonverbal signals of availability. Again, this has important implications for DIT, which argues the importance of being able to send uninhibited nonverbal signals. If cell phones distract individuals from cognitive awareness during conversations, they are more likely to send unintended nonverbal signals (i.e., glancing at a message without realizing that they are signaling decreased interest in co-present conversation partners). Future research on DIT, must therefore account for technological changes in order to better explain how individuals send and receive messages in a world that simultaneously includes both face-to-face and mediated communication. For example, the theory has yet to
explain what happens when two co-present individuals send mediated messages to one another. In this way, they may be communicating digitally, without needing to look up, allowing them to send symbolic messages but missing out on spontaneous messages.

Despite the limited range in terms of age, findings also mirror previous literature that suggests older individuals are likely to have different experiences with phubbing than their younger counterparts (Forgays, 2014). In Study 1, older participants were less likely to report being phubbed by their parents, perhaps because their parents were also older and, as Forgays (2014) noted, older generations were less likely to use phones in social settings. In Study 2, older participants were more likely to report being phubbed by their romantic partner. Here, the difference likely occurred because older participants feel more disrespected when phubbed (Kadylak, 2020). Age, itself, is likely not as important as previous experiences, norms, and expectations concerning phone usage, which expectations, Miller-Ott (2014) argued, play an important role in whether or not phone usage has a negative effect on relational outcomes.

Taken together, findings suggest that using a cell phone while in the presence of children and/or romantic partners has negative effects on relational outcomes. Specifically, parental phubbing was negatively connected indirectly to parental acceptance and partner phubbing was negatively connected indirectly to relationship satisfaction. Each of these associations were moderated by satisfaction with phone usage within the relationship, suggesting that individual differences may change the effect of phubbing. However, individuals who were phubbed also generally reported lower levels of satisfaction for phone usage. Individuals should therefore be aware of how they are influencing communication, consciously or otherwise, by using their phones during face-to-face conversations.
General Limitations & Future Directions

Aside from those analytical limitation discussed previously; a number of additional limitations must be considered. One important limitation to consider is that this study relies on cross-sectional data, which may not accurately portray directionality or causation between study variables. For example, it may be that partner phubbing leads to rejection sensitivity because continual phubbing from a partner may cause the individual to begin focusing on signs of rejection. This might be less likely, because rejection sensitivity acts more like a trait variable developed through childhood relationships, but it is not improbable. Just as likely, many of the proposed relationships may occur reciprocally such that variables push one another simultaneously. Therefore, associations proposed in the present study ought to be tested experimentally. Whereas cross-sectional data identifies interesting connections, experimental data would better indicate causality.

Sampling differences between Study 1 and Study 2, which focused on individuals in specific relational stages (i.e., single vs in a romantic relationship), may have also skewed findings. Because individuals who have felt rejected by their parents often develop maladaptive social behaviors, they may have a more difficult time forming romantic relationships (Rohner, 2016). Thus, a study comprised entirely of single participants is likely to have included more rejection sensitive individuals than are found in the general population. A single study which utilizes both parental and romantic partner phubbing may help explain the long-term effects of parental phubbing more fully. Ideally, a longitudinal study would show not only the long-term effects of parental phone usage, but would also uncover reciprocal relationships. Because phubbing is likely to have reciprocal associations with other variables (e.g., parents phubbing their children causes children to engage in phubbing behaviors which then causes children to
begin phubbing their parents), it would be interesting to see how child phubbing influences parental behaviors. For example, children who phubb their parents may instigate stricter parental controls, which in-turn also influence perceptions of parental acceptance.

Another important limitation is that of sampling college students. Although college-based sampling provides a useful means of gaining information quickly, and may still be generalizable within certain populations, it also misses out on important smaller populations. Specifically, it is not known how phones affect families and relationships among individuals who may not be able to afford college or attend for a number of other reasons. It is also not known how phones affect different cultures, which are likely to have differing norms and expectations when it comes to cell phone usage. For example, Pew Research (2015) reported racial and ethnic differences in how individuals use their phones, which likely influence norms and expectations such that phone usage may influence cultures differently. Thus, associations should be tested among a more heterogeneous population, in order to account for cultural nuances as well as underprivileged populations. It would be interesting to uncover differences among individuals with varying socio-economic, cultural, and generational backgrounds.

Similarly, as cell phone norms and expectations have been shown to vary across generations (Forgays, 2014), findings from the present study are likely to reflect only young adults. The effects of phubbing may differ within different generations and when conversation partners belong to different generations themselves. For example, Kadylak (2020) recently noted that older individuals were more likely to feel disrespected after being phubbed than younger individuals. As no known study has tested the experience of phubbing among young children, other than recollections of past childhood experience, it is unclear how phubbing may be influencing the youth of today.
As noted previously, both pilot testing and testing in Study 2 suffered from variables with poor reliability. Specifically, the measure of immediacy utilized in pilot testing was more reflective of deviations from normal immediacy, rather than of actual immediacy behaviors during the conversations. Furthermore, items did not load properly, requiring every reversed-scored item to be removed from analysis. Such limitation, along with the findings concerning immediacy within Study 2, suggest that pilot test findings on immediacy are not reflective of real-world experience. However, this limitation was resolved in Study 2, improving the overall takeaway on immediacy. Similarly, measures of emotional and cognitive empathy within Study 2 did not reach appropriate alpha levels. Thus, the reason moderation effects for affect receiving ability were not present, may have been because they were not measured appropriately.

Finally, because differences emerged between Ibrahim et al. (2015) and the present study, future research should test the association between parental acceptance and rejection sensitivity along with other potential interaction variables. For example, the influence of early childhood abuse seems to be moderated by emotional resilience (Kim, Kim, Park, Choi, Oh, & Seok, 2018). This, along with other variables, may help to better explain when and why parental acceptance leads to rejection sensitivity.

Conclusion

The purpose of this study was to determine why individuals phubb and how phubbing influences parent/child and romantic relationships. It is important to note, however, that findings from this study are not meant as an attack on cell phones. Indeed, cell phones provide a number of significant life affordances and enhance communication in a variety of ways. However, in order to best utilize cell phones and reap their many benefits, individuals must know how and when cell phone usage is appropriate. At least currently, cell phone usage during face-to-face
conversations is likely to cause conversation partners to feel snubbed and rejected. As suggested by IPARTheory, such behavior by parents is likely to have negative impacts on the development of their children. And, as noted with DIT, phubbing is likely to disrupt the process of sending and receiving nonverbal signaling that would otherwise serve to enhance relationships. Individuals will benefit from understanding the unintentional messages that they send to co-present others when they phubb. As we continue to learn about these harmful effects, we are better able to utilize cell phone technology in ways that improve, rather than inhibit, communication and relational development.
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Appendix A: Tables

Table 1 - *Pilot Study: Correlations between Variables for Cell Phone Presence*

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*p < .05, **p < .01, ***p < .001
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<td>-.155*</td>
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*p < .05, **p < .01, ***p < .001
Table 3 – *Study 1: Gender Differences in Major Variables for Parent-Child Relationships*

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*p < .05, **p < .01, ***p < .001
Table 4 - *Study 2: Correlations between Variables for Phubbing in Romantic Relationships*

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<td>-.233**</td>
<td>.527**</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>6. Relationship Satisfaction</td>
<td>-.106</td>
<td>.050</td>
<td>-.222**</td>
<td>.502**</td>
<td>.544**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Rejection Sensitivity</td>
<td>.239**</td>
<td>.031</td>
<td>.255**</td>
<td>-.046</td>
<td>.090</td>
<td>.004</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Emotional Empathy (CARAT-S)</td>
<td>.027</td>
<td>-.118</td>
<td>-.064</td>
<td>.235**</td>
<td>.140</td>
<td>.198*</td>
<td>.039</td>
<td></td>
</tr>
<tr>
<td>9. Cognitive Empathy (CARAT-SPR)</td>
<td>.066</td>
<td>.021</td>
<td>.052</td>
<td>.168*</td>
<td>.120</td>
<td>.067</td>
<td>.010</td>
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*p < .05, **p < .01, ***p < .001
Table 5 – *Study 2: Gender Differences in Major Variables for Romantic Relationships*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Possible Range</th>
<th>Female (N = 131)</th>
<th>Male (N = 131)</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Partner Phubbing</td>
<td>1-7</td>
<td>3.32 1.17</td>
<td>3.28 .94</td>
<td>-.23</td>
</tr>
<tr>
<td>2. Satisfaction with partner phone usage</td>
<td>1-7</td>
<td>4.61 .88</td>
<td>4.54 .92</td>
<td>-.48</td>
</tr>
<tr>
<td>3. Rejection Sensitivity</td>
<td>13-52</td>
<td>37.35 7.79</td>
<td>33.81 6.11</td>
<td>-2.88**</td>
</tr>
<tr>
<td>4. Immediacy</td>
<td>1-7</td>
<td>5.88 .71</td>
<td>5.79 .67</td>
<td>-.77</td>
</tr>
<tr>
<td>5. Relationship Satisfaction</td>
<td>1-7</td>
<td>5.91 .76</td>
<td>6.07 .78</td>
<td>1.25</td>
</tr>
<tr>
<td>6. Emotional Empathy</td>
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<td>.94 .08</td>
<td>.94 .08</td>
<td>-3.12</td>
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<td>7. Cognitive Empathy</td>
<td>0-1</td>
<td>.45 .12</td>
<td>.43 .10</td>
<td>-.78</td>
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</tbody>
</table>

*p < .05, **p < .01, ***p < .001
Table 6 – Study 2: Mediation Model for Hypothesis 10

<table>
<thead>
<tr>
<th>Antecedents</th>
<th>Mediator</th>
<th>Dependent Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Satisfaction w/ Partner Phone Usage</td>
<td>Relationship Satisfaction</td>
</tr>
<tr>
<td></td>
<td>β</td>
<td>SE</td>
</tr>
<tr>
<td>Constant</td>
<td>.00</td>
<td>.07</td>
</tr>
<tr>
<td>Satisfaction for partner phone usage</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Direct effect of Partner Phubbing</td>
<td>-.56***</td>
<td>.07</td>
</tr>
<tr>
<td>Indirect effect of Partner Phubbing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total effect of Partner Phubbing</td>
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</tbody>
</table>

LLCI: bias corrected lower limit confidence interval; ULCI: bias corrected upper limit confidence interval
Note: Standardized regression coefficients are shown; bootstrap sample size = 5000; *p < .05, **p < .01, ***p < .001
### Study 2: Moderated Mediation Model for Hypothesis 11

<table>
<thead>
<tr>
<th>Antecedents</th>
<th>β</th>
<th>SE</th>
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<th>$R^2$</th>
<th>LLCI</th>
<th>ULCI</th>
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<tr>
<td>Satisfaction w/ Partner Phone Usage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
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<td>.07</td>
<td>.04</td>
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<td>.14</td>
<td></td>
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<tr>
<td>Partner Phubbing</td>
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<td>.07</td>
<td>-7.99</td>
<td>-.73</td>
<td>-.44</td>
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<tr>
<td>Rejection Sensitivity</td>
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<td>.07</td>
<td>1.41</td>
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<tr>
<td>Interaction between Partner Phubbing and Rejection Sensitivity</td>
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<td>.06</td>
<td>-.16</td>
<td>-.14</td>
<td>.12</td>
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</tr>
<tr>
<td><strong>Relationship Satisfaction</strong></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Constant</td>
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<td>.08</td>
<td>.002</td>
<td>-.15</td>
<td>.15</td>
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</tr>
<tr>
<td>Partner Phubbing</td>
<td>.08</td>
<td>.10</td>
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<td>Satisfaction for Partner Phone Usage</td>
<td>.55***</td>
<td>.08</td>
<td>6.65</td>
<td>.385</td>
<td>.71</td>
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</tr>
<tr>
<td>Rejection Sensitivity</td>
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<td>.07</td>
<td>.126</td>
<td>-.13</td>
<td>.15</td>
<td></td>
</tr>
<tr>
<td>Interaction between Partner Phubbing and Rejection Sensitivity</td>
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<td>.09</td>
<td>-.01</td>
<td>-.18</td>
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**Mediation Effects**

<table>
<thead>
<tr>
<th></th>
<th>β</th>
<th>SE</th>
<th>t</th>
<th>LLCI</th>
<th>ULCI</th>
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</thead>
<tbody>
<tr>
<td>Indirect effect of Partner Phubbing</td>
<td>-.32***</td>
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<td>-.46</td>
<td>-.21</td>
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<tr>
<td>Conditional Direct Effect of Phubbing</td>
<td>.08</td>
<td>.10</td>
<td>-.11</td>
<td>.27</td>
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</table>

LLCI: bias corrected lower limit confidence interval; ULCI: bias corrected upper limit confidence interval.
Note: Standardized regression coefficients are shown; bootstrap sample size = 5000; *p < .05, **p < .01, ***p < .001
### Table 8 – Study 2: Mediation Model for Hypothesis 12

<table>
<thead>
<tr>
<th>Antecedents</th>
<th>Mediator</th>
<th>Dependent Variable</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Satisfaction w/ Partner Phone Usage</td>
<td>Immediacy</td>
<td></td>
</tr>
<tr>
<td><strong>Coefficient</strong></td>
<td><strong>SE</strong></td>
<td><strong>t</strong></td>
<td><strong>R²</strong></td>
</tr>
<tr>
<td>Constant</td>
<td>.00</td>
<td>.07</td>
<td>.00</td>
</tr>
<tr>
<td>Satisfaction for partner phone usage</td>
<td>-</td>
<td>-</td>
<td>.58***</td>
</tr>
<tr>
<td>Direct effect of Partner Phubbing</td>
<td>-.56***</td>
<td>.07</td>
<td>-7.91</td>
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</table>

**Indirect effect of Partner Phubbing**

<table>
<thead>
<tr>
<th><strong>Coefficient</strong></th>
<th><strong>SE</strong></th>
<th><strong>LLCI</strong></th>
<th><strong>ULCI</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>-.32***</td>
<td>.06</td>
<td>-.43</td>
<td>-.22</td>
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</tbody>
</table>

**Total effect of Partner Phubbing**

<table>
<thead>
<tr>
<th><strong>Coefficient</strong></th>
<th><strong>SE</strong></th>
<th><strong>LLCI</strong></th>
<th><strong>ULCI</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>-.23**</td>
<td>.08</td>
<td>-.40</td>
<td>-.07</td>
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</table>

LLCI: bias corrected lower limit confidence interval; ULCI: bias corrected upper limit confidence interval

Note: Standardized regression coefficients are shown; bootstrap sample size = 5000; *p < .05, **p < .01, ***p < .001

### Table 9 – Study 2: Moderation Model for Hypothesis 13a

<table>
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<th>Antecedents</th>
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<tbody>
<tr>
<td></td>
<td>Immediacy</td>
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</tr>
<tr>
<td><strong>Coefficient</strong></td>
<td><strong>SE</strong></td>
<td><strong>t</strong></td>
</tr>
<tr>
<td>Constant</td>
<td>.01</td>
<td>.08</td>
</tr>
<tr>
<td>Partner Phubbing</td>
<td>-.23**</td>
<td>.08</td>
</tr>
<tr>
<td>Emotional Empathy</td>
<td>.10</td>
<td>.08</td>
</tr>
<tr>
<td>Interaction between Partner Phubbing and Emotional Empathy</td>
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<td>.08</td>
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</table>

LLCI: bias corrected lower limit confidence interval; ULCI: bias corrected upper limit confidence interval

Note: Standardized regression coefficients are shown; bootstrap sample size = 5000; *p < .05, **p < .01, ***p < .001
Table 10 – Study 2: Moderation Model for Hypothesis 13b

<table>
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<tr>
<th>Antecedents</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>β</td>
<td>SE</td>
<td>t</td>
<td>R²</td>
</tr>
<tr>
<td>Constant</td>
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<td>.08</td>
<td>-.04</td>
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<td>Partner Phubbing</td>
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<td>.08</td>
<td>2.97</td>
<td>-.41</td>
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<tr>
<td>Cognitive Empathy</td>
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<td>Interaction between Partner Phubbing and Cognitive Empathy</td>
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<td>.79</td>
<td>-.10</td>
</tr>
</tbody>
</table>

LLCI: bias corrected lower limit confidence interval; ULCI: bias corrected upper limit confidence interval

Note: Standardized regression coefficients are shown; bootstrap sample size = 5000; *p < .05, **p < .01, ***p < .001
Appendix B: Figures

Figure 1 – Pilot Study: Hypothesized Model for Cell Phone Presence
Figure 2 – *Study 1: Hypothesized Model for Parent/Child Phubbing*

Note. This Model was proposed and tested for remembrances of both parents’ acceptance/rejection.
Figure 3a – Study 1: Maternal Phubbing with Daughters and Sons Including Covariates
Model Fit Indices: \( \chi^2/df = .862 \), CFI = 1.00, and RMSEA < .001
Figure 3b – Study 1: Maternal Phubbing with Daughters and Sons Excluding Covariates

Maternal Phubbing

- .59***

Satisfaction w/ Maternal Phone Usage

- .44***

- .10, n.s.

- .08, n.s.

- .08, n.s.

Maternal Acceptance

- .08, n.s.

- .09, n.s.

Rejection Sensitivity

- .14*

.07, n.s.

Problematic Cell Phone Usage

- 31***

Child’s Tendency to Phubb

- .41***

Model Fit Indices: $\chi^2$/df = 852, CFI = 1.00, and RMSEA < .001
Figure 4a – Study 1: Maternal Phubbing with Daughters Only Including Covariates

![Diagram]

Model Fit Indices: χ²/df = .658, CFI = 1.00, and RMSEA < .001
Figure 4b – Study 1: Maternal Phubbing with Daughters Only Excluding Covariates

Model Fit Indices: $\chi^2/df = .658$, CFI = 1.00, and RMSEA < .001
Figure 5a – Study 1: Maternal Phubbing with Sons Only Including Covariates

Model Fit Indices: $\chi^2$/df = .809, CFI = 1.00, and RMSEA < .001
Figure 5b – Study 1: Maternal Phubbing with Sons Only Excluding Covariates

Model Fit Indices: $\chi^2$/df = .809, CFI = 1.00, and RMSEA < .001
Figure 6a – Study 1: Paternal Phubbing with Daughters and Sons Including Covariates

Model Fit Indices: χ²/df = 1.35, CFI = .98, and RMSEA = .029
Figure 6b – Study 1: Paternal Phubbing with Daughters and Sons Excluding Covariates

Model Fit Indices: \( \chi^2/df = 1.35 \), CFI = .98, and RMSEA = .029
Figure 7a – Study 1: Paternal Phubbing with Daughters Only Including Covariates

Model Fit Indices: $\chi^2/df = 1.04$, CFI = .995, and RMSEA = .014
Figure 7b – Study 1: Paternal Phubbing with Daughters Only Excluding Covariates

Model Fit Indices: $\chi^2$/df = 1.04, CFI = .995, and RMSEA = .014
Figure 8a – Study 1: Paternal Phubbing with Sons Only Including Covariates
Model Fit Indices: $\chi^2$/df = 1.29, CFI = .96, and RMSEA = .038
Figure 8b – Study 1: Paternal Phubbing with Sons Only Excluding Covariates

Model Fit Indices: $\chi^2$/df = 1.29, CFI = .96, and RMSEA = .038
Figure 9 - Study 2: Spontaneous and Symbolic Communication

The Affect/Reason Continuum

Relative Influence

SYMBOLIC COMMUNICATION

SPONTANEOUS COMMUNICATION
Figure 10 - Study 2: Hypothesized Model for Phubbing in Romantic Relationships

- Rejection Sensitivity
- Partner Phubbing
- Emotional Empathy
- Cognitive Empathy
- Satisfaction w/ Partner Phone Usage
- Partner Immediacy
- Relationship Satisfaction
Figure 11a – Study 2: Phubbing within Romantic Relationships

Model Fit Indices: $\chi^2$/df = 1.01, CFI = .999, and RMSEA = .007
Figure 12 – Study 2: Phubbing within Romantic Relationships for Females Only

Model Fit Indices: χ²/df = .74, CFI = 1.00, and RMSEA < .001
Figure 13 – Study 2: Phubbing within Romantic Relationships for Males Only

Model Fit Indices: $\chi^2/df = 1.13$, CFI = .972, and RMSEA = .048