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FULL PAPER

Put down your smartphone – unless you integrate it into the conversation!

An experimental investigation of using smartphones during face to face communication

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Eine experimentelle Untersuchung zur Nutzung von Smartphones während Face-to-Face-Gesprächen

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Abstract: In times of permanent connectedness, smartphones are used in almost any situation, even during face to face (f2f) communications. Observational studies have shown that smartphone users can either phub their interaction partners or integrate the device into the ongoing co-present conversation. However, research in this field did not sufficiently distinguish between these types of use. Referring to the expectancy violations theory, this experiment (N = 402) investigated the effects of smartphone use more differentiated by manipulating the type of use on four levels (proactive, reactive, integrative, no use). Results indicated that interrupting a conversation proactively and reactively decreased the perceived attentiveness and politeness of the interaction partner as well as the conversational quality. In contrast, an integrative type of use did neither harm nor improve conversation outcomes and seemed to be in line with communicative expectations. Contrary to expectations, individuals' own phubbing behavior did not influence how they evaluated the smartphone use of their interaction partner.

Keywords: Smartphone, phubbing, divided attention, expectancy violations, joint attention.

Zusammenfassung: In Zeiten permanenter Verbundenheit werden Smartphones in nahezu allen Situationen genutzt – oft sogar während des Führens von Face-to-Face-Gesprächen. Beobachtungsstudien haben gezeigt, dass Smartphone-Nutzer*innen dabei entweder das Gespräch unterbrechen und ihr Gegenüber vor den Kopf stoßen (sog. phubbing) oder das Smartphone in die Unterhaltung integrieren können. Diese unterschiedlichen Nutzungsweisen wurden in der bisherigen Forschung jedoch noch nicht ausreichend differenziert. Unter Bezugnahme auf die Theorie der Erwartungsverletzung untersuchte diese Experimentalstudie (N = 402) daher die Auswirkungen der Smartphone-Nutzung differenzierter, indem die Nutzungsart auf vier Stufen manipuliert wurde (proaktive, reaktive, integrative und keine

Nutzung). Die Ergebnisse zeigen, dass das Unterbrechen einer Unterhaltung aufgrund von proaktiver und reaktiver Smartphone-Nutzung die Bewertung der Gesprächsqualität sowie der Aufmerksamkeit und Höflichkeit des Gegenübers verschlechterte. Im Gegensatz dazu hat die integrative Nutzung die Bewertung dieser Merkmale weder verschlechtert noch verbessert und scheint somit konform mit kommunikativen Erwartungen zu sein. Das eigene Phubbing-Verhalten hatte darüber hinaus keinen Einfluss darauf, wie die Smartphone-Nutzung des Gegenübers bewertet wurde.

Schlagwörter: Smartphone, phubbing, geteilte Aufmerksamkeit, Erwartungsverletzung, gemeinsame Nutzung.

1. Introduction

The use of smartphones for daily activities has become indispensable in today's world, enabling users to be permanently online and permanently connected (POPC; Vorderer, Hefner, Reinecke, & Klimmt, 2018). As smartphone users know that they can receive notifications anytime and anywhere, they constantly pay attention to their devices (Burchell, 2015). Following Klimmt, Hefner, Reinecke, Rieger, and Vorderer (2018), this cognitive state of online vigilance can even motivate users to interrupt their offline activities in order to monitor their online sphere. Consequently, the use of smartphones can also be observed in situations in which it was previously regarded as socially inappropriate, for instance, during face to face (f2f) communications (Vorderer, Krömer, & Schneider, 2016). According to Rainie and Zickuhr (2015), even 89 percent of smartphone owners stated that they use their mobile devices in the presence of others. This was also supported by observational data indicating that more than three-quarters of all friendship dyads used their smartphones during a five-minute interaction (Brown, Manago, & Trimble, 2016). Regarding the frequency and duration, Vanden Abeele, Hendrickson, Pollmann, and Ling (2019) have shown that smartphones were used on average 3.16 times, for a total duration of one and a half minutes in a ten-minute conversation.

In previous research (e.g., Chotpitayasunondh & Douglas, 2018; Misra, Cheng, Genevie, & Yuan, 2014; Vanden Abeele, Antheunis, & Schouten, 2016), this phenomenon has often been labeled "phubbing" – a composition of the terms "phone" and "snubbing" – which highlights the negative consequences that using a smartphone during f2f communication can have on different conversation outcomes (e.g., conversational quality). In these studies, the use of smartphones was operationalized as one person having access to the mobile device, keeping its content to him-/herself, and interrupting the conversation due to its use. Although Vanden Abeele et al. (2016) further distinguished between different reasons for this interruption – responding to incoming signals of a smartphone (i.e., reactive) or using a smartphone for no apparent reason (i.e., proactive) – the underlying assumption was that one interaction partner interrupts the conversation due to the smartphone use. However, phubbing is not the only way how smartphones are used during f2f communications. Different ethnographic studies indicated that smartphones can be integrated into conversations in terms of collective information

seeking or sharing activities, such as reading text messages aloud and showing images (e.g., Brown, McGregor, & McMillan, 2015; DiDomenico, Raclaw, & Robles, 2018; Ictech, 2019; Raclaw, Robles, & DiDomenico, 2016; Weilenmann & Larsson, 2001). Even though such sharing activities occur in one-third of all usage moments (Vanden Abeele et al., 2019), they have not yet been studied experimentally. Thus, it remains unclear what causal effects integrating a smartphone into f2f communication has – in comparison to other types of use – on communication outcomes. Therefore, the present study aims to investigate the potential effects of smartphone use in moments of physical co-presence in a more differentiated manner by asking: *To what extent do different types of smartphone use during f2f communication (proactive, reactive, and integrative) influence the perceived conversational quality as well as the attentiveness and politeness of the interaction partner?* All material and data that were used within this study are publicly available in the Open Science Framework (OSF, see: https://osf.io/sqhz3/).

2. Theoretical background

2.1 Communicative expectations and their violation

According to several media etiquettes studies, using smartphones in social situations is perceived as "inappropriate," "rude," "impolite," "annoying," "distracting," and "disrespectful" (e.g., Forgays, Hyman, & Schreiber, 2014; Harrison, Bealing, & Salley, 2015; Ictech, 2019; Kelly, Miller-Ott, & Duran, 2019; Moser, Schoenebeck, & Reinecke, 2016; Rainie & Zickuhr, 2015). Thus, even in today's POPC culture, there seems to be a normative expectation that interpersonal communication should not involve the use of mobile devices. Consequently, using smartphones during f2f communications has often been described as a violation of communicative expectations (e.g., Kadylak, 2020; Kelly, Miller-Ott, & Duran, 2017; Miller-Ott & Kelly, 2015, 2017). The effects of this violation can be explained using Burgoon's (1993) expectancy violations theory (EVT). This theory postulates that violations of interpersonal expectations are perceived as being highly arousing and disturbing. To overcome this unpleasant state, individuals try to interpret and evaluate the enacted behavior. Burgoon (1993) introduced the term "positive violation" to describe situations in which the enacted behavior is evaluated more positively than the expected one. In contrast, a "negative violation" describes an enacted behavior that is evaluated more negatively than the expected one. According to EVT, individuals pay increased attention to the characteristics of the violator (e.g., his/her nonverbal acts) during this interpretation process. Consequently, whether violations are rated either positively or negatively strongly depends on how they interpret the violator's nonverbal behavior. Therefore, when smartphone users violate the communicative expectations of their interaction partners, it must be considered which nonverbal behavior their proactive, reactive, or integrative usage behavior entails. Within EVT, the consequences of violating communicative expectations are described relative to confirmed expectations: Positive violations are theorized as more beneficial for communication outcomes, whereas negative violations are theorized as more detrimental (Bur-

goon, 1993). Following this comparative logic, the following chapters postulate how the respective violation (i.e., different types of smartphone use) may affect perceived attentiveness, politeness, and conversational quality compared to confirmed expectations (i.e., not using smartphones during f2f communication).

2.2 Interrupting f2f conversations (proactively or reactively)

Empirical evidence has shown that the presence and use of a smartphone diminish attention resources (Hyman, Boss, Wise, McKenzie, & Caggiano, 2010; Thornton, Faires, Robbins, & Rollins, 2014). As the human brain has to perform task-switching in "multitasking" situations (e.g., Lien, Ruthruff, & Johnston, 2006; Srivastava, 2013), smartphone users have to divide their attention between their smartphone and the f2f conversation. Consequently, individuals who phub during f2f conversations – no matter whether they phub proactively of reactively – cannot pay the full amount of attention to their interaction partners. Previous studies found that this lack of attention led to cognitive pauses in f2f communications (Oulasvirta, Tamminen, Roto, & Kuorelathi, 2005) and the risk of mishearing statements (Newman & Smith, 2006). This is also reflected in users' nonverbal behavior as they turn their gaze away from the interaction partner when looking at their smartphones. Research has shown that a reduced eye contact due to phubbing is perceived as a lack of commitment (Halpern & Katz, 2017) and results in feelings of social exclusion (Gonzales & Wu, 2016; Hales, Dvir, Wesselmann, Kruger, & Finkenauer, 2018). Given that phubbing breaks the rule of mutual attention (Ictech, 2019) and results in an aversive nonverbal behavior, this violation should be rated negatively and might affect communication outcomes adversely (Burgoon, 1993).

In line with this assumption, several experiments revealed that using a smartphone during f2f communications has a negative impact on three aspects: Firstly, phubbing negatively affects the evaluation of the f2f conversation, for example, resulting in a poorer conversational quality (Brown et al., 2016; Chotpitayasunondh & Douglas, 2018). Secondly, the users themselves are rated more negatively, for instance, as less trustworthy (Krishnan, Kurtzberg, & Naquin, 2014), empathic (Misra et al., 2014), attentive (Vanden Abeele et al., 2016), and civil (Cameron, Barki, & Plante, 2012). Thirdly, phubbing also impairs the relationship between the interaction partners in terms of a reduced partner closeness, less interpersonal connectedness, or a poorer affiliate disposition (Przybylski & Weinstein, 2013; Vanden Abeele & Postma-Nilsenova, 2018). This supports the underlying assumption that phubbing violates the rule of mutual attention and is rated as a negative expectancy violation (Burgoon, 1993). As both proactive and reactive smartphone use interrupt f2f communications, these types of use should adversely affect communication outcomes. Thus, the following was assumed:

> *H1: Conversations in which a smartphone is used by one conversational partner (proactively or reactively) lead to a more negative appraisal of a) the user's attentiveness, b) politeness, and c) the overall conversational quality, compared to those where no smartphone is used.*

In addition, these two reasons for interrupting a f2f conversation should be differentiated. Vanden Abeele et al. (2016) found that using a smartphone for no apparent reason (i.e., proactive) was perceived as a more severe expectancy violation than responding to incoming signals of a smartphone (i.e., reactive). Given the normative expectation of permanent availability that exists in POPC times (e.g., Forgays et al., 2014; Hefner & Vorderer, 2017; Ling, 2012, 2016), interaction partners seem to be more tolerant toward reactive use as they understand the users' obligation of having to respond immediately. In contrast, proactive use may be interpreted as a lack of interest in interacting with the interaction partner. Referring to the EVT (Burgoon, 1993), different reasons for using a smartphone should be associated with varying degrees of the perceived violation: Proactive smartphone use might be interpreted as a more severe threat to communicative expectations as the violation is initiated by the interaction partner. In contrast, in the case of reactive use, the source of this violation is a third person to whom the interaction partner is merely reacting. Given that negative violations are theorized as detrimental for communicative outcomes (Burgoon, 1993), this adverse effect should increase with the degree of the negative violation. Therefore, proactive and reactive use should not only lead to differences in perceived attentiveness and politeness (Vanden Abeele et al., 2016) but also affect the overall conversational quality differently:

> *H2: Conversations that are interrupted in a proactive way lead to a more negative appraisal of the interaction partner's a) attentiveness, b) politeness, and c) the overall conversational quality, compared to those where a smartphone is used reactively.*

2.3 Integrating smartphones into f2f conversations

Observational studies identified different ways by which smartphones can be integrated into f2f conversations. For example, there are minimal forms of sharing activities where the smartphone itself remains in the hands of one interaction partner, but the content retrieved is incorporated into the conversation. This can occur when reading text messages aloud, when providing visual access to the images on the smartphone screen, or when collectively searching the internet for information via one device (Brown et al., 2015; DiDomenico et al., 2018; Kelly et al., 2017; Raclaw et al., 2016; Weilenmann & Larsson, 2001). Even though the other interaction partners do not hold the device in their hands, they are not excluded from the activity with the smartphone. There are also other, more intense forms of integration, for example, taking pictures together (Ictech, 2019) or physically passing the smartphone to the other interaction partner (Weilenmann & Larsson, 2001).

As smartphones are tools for collaborative interaction, Raclaw et al. (2016) replaced the concept of *divided attention* with that of *joint attention* (Moore & Dunham, 1995). Thus, when a smartphone is integrated into f2f conversations, the user's attention does not have to be divided between the f2f conversation and the activity with the smartphone. Rather, both interaction partners turn their full

attention to one mobile device and its shared contents. Moreover, embedding smartphones into social interactions provides the interaction partners access to information that would otherwise not be available (Raclaw et al., 2016). As this can enrich the conversational quality, the interaction partners might be more likely to tolerate this usage behavior (Drago, 2015).

However, research on media etiquettes did not identify which specific type of smartphone use is perceived as socially (in)appropriate. Instead, they investigated whether using smartphones during f2f conversation is "generally okay or not" (Rainie & Zickuhr, 2015). In line with these findings, this paper argues that the use of smartphones during f2f communications is perceived as a violation of communicative expectations per se (e.g., Kadylak, 2020; Kelly et al., 2017; Miller-Ott & Kelly, 2015, 2017). As each usage episode is initiated by one person reaching out for its device, this should – at least in the first step – arouse negative associations and violate communicative expectations. Following Burgoon (1993), individuals should especially pay attention to the nonverbal behavior of a violator and interpret the violation when trying to overcome this unpleasant state. When the smartphone user starts to perform the above-mentioned sharing activities and displays joint attention, the interaction partner realizes that the smartphone is used functionally and in line with the goals of the ongoing f2f interaction. In terms of the EVT (Burgoon, 1993), this is a situation in which the enacted behavior (i.e., integrating a smartphone) is evaluated more positively than the expected one (i.e., using no smartphone). Consequently, this initially perceived violation should be rated positively in the second step. As Burgoon (1993) theorized positive violations as more beneficial for interaction patterns and outcomes than expectancy confirmations, the following was assumed:

> *H3: Integrating a smartphone into f2f communications leads to a more positive appraisal of the interaction partner's a) attentiveness, b) politeness, and c) the overall conversational quality, compared to conversations where no smartphone is used.*

2.4 Phubbing behavior as a predictor of communicative expectations

According to EVT (Burgoon, 1993), social expectations are not universally valid. Thus, the underlying assumption that using smartphones during f2f communication is interpreted as a violation of communicative expectations needs to be considered in a more nuanced manner. Although this assumption was based on recent media etiquette studies (e.g., Harrison et al., 2015; Ictech, 2019; Kelly et al., 2019; Moser et al., 2016), empirical evidence has shown that communicative expectations vary by person. Burgoon (1993) assumed that expectations derive from communicator characteristics which are defined as "salient features of individual actors that lead one communicator to anticipate how another will communicate" (p. 32). One important communicator characteristic in the context of this study is an individual's own smartphone usage behavior. Recent research revealed that intense phubbing behavior is associated with the perception that using smartphones in moments of physical co-presence is normatively appropriate (e.g.,

Chotpitayasunondh & Douglas, 2016; Schneider & Hitzfeld, 2019). In terms of EVT (Burgoon, 1993), it seems plausible that individuals who frequently phub during f2f conversations do not perceive the smartphone use of their interaction partners as a violation of expectations and thus evaluate the conversation outcomes more positively than those who seldom phub. Therefore, individuals' own phubbing behavior should be considered as a predictor of conversation outcomes, independent of the interaction partners' (proactive, reactive, and integrative) usage behavior. This led to the following hypothesis:

> *H4: The more often individuals use their smartphones during f2f conversations, the less negatively they evaluate the a) attentiveness and b) politeness of a smartphone-using interaction partner, as well as c) the overall conversational quality.*

3. Method

3.1 Design and manipulation

To test the above-mentioned hypotheses, a between-subjects experiment was conducted in which the independent variable – type of smartphone use – was manipulated on four levels: integrative, proactive, reactive, and no use. This enabled to test whether the dependent variables (conversational quality, attentiveness, and politeness) were perceived differently, depending on whether a smartphone was used in an integrative way or whether it interrupted the conversation (proactively or reactively), compared to not being used at all. The manipulation was conducted using text vignettes (see file "stimulus material" on OSF for the original German version and their English translation) that describe a conversation of a befriended same-sex dyad in a coffee shop. In the story, the two friends plan a summer vacation they want to spend together. During the conversation, they try to find a compromise on how to combine their contrary ideas regarding its nature (city sightseeing versus beach holiday). The process of reaching this agreement varies depending on the experimental condition: In the integrative usage group, the interaction partner uses his/her smartphone to search for potential holiday destinations and then incorporates the retrieved information into the conversation. He/she reads the information obtained from a website aloud and shares a picture by physically passing the smartphone to the first-person narrator, thus representing a functionally beneficial smartphone usage. In the case of reactive and proactive uses, the friends agree on a destination without this additional information. Instead, they are interrupted once because the interaction partner types something into his/her smartphone (reactive: in response to a notification; proactive: for no apparent reason). In the control condition, the whole conversation takes place without using a smartphone. Consequently, although all four versions of the conversation lead to the same outcome (i.e., finding a compromise regarding the destination), the different forms of smartphone use either facilitate (i.e., integrative use) or hinder (i.e., proactive and reactive use) the process of finding this compromise.

The vignettes were used to guarantee a balance between internal and external validity (Aguinis & Bradley, 2014). As a major advantage in terms of internal validity, they allowed to control for various third variables (e.g., number, length, and duration of interruptions) and thus avoided confounding effects. As reading narratives requires constant mental simulation and is theorized as being more transporting than being exposed to video messages (Brock & Green, 2005), the vignettes were presented in text format. In line with this argument, a meta-analysis found that written stimuli have greater effects on transportation and identification than videos (Tukachinsky, 2014). To increase the participants' degree of involvement with the scenario introduced by the vignettes, the conversation was illustrated very vividly by using literal speech and reached an average length of 49 sentences. Furthermore, the stories were written from a first-person perspective and the participants were given the option of choosing a name for the imagined conversation partner. Before data collection, a pretest (N = 21) was conducted to validate the effectiveness of these vignettes. Based on the answers regarding the attention and manipulation checks (see section "Measures"), the minimum reading time to notice the different types of smartphone use described in the story was set at 49 seconds. As all participants with a reading time of at least 49 seconds answered those checks correctly and showed a high degree of involvement (M = 4.30, SD = 0.78; on a 5-point scale), the vignettes were used without further modifications – except for correcting spelling mistakes – in the main study.

3.2 Procedure

Data were collected using an online survey in the time period from April 12th to May 2nd, 2017. As the vignettes could not be formulated as universally suitable for all ages, this survey addressed a homogeneous student sample to increase the ability of being involved in the conversation. Therefore, the link was distributed via e-mail to undergraduate students at a midsize German university and posted in student Facebook groups with members from different geographical regions of Germany. Moreover, several students shared the link in their personal networks. The aim of the study was described as "communication in friendships" to guarantee that the participants were truly blind about its topic. After entering the welcome page, socio-demographic variables were measured to determine whether one should imagine a male or a female interaction partner. Subsequently, the participants were instructed to read the following story as if they were part of the conversation. To facilitate imagination, participants were asked to provide a name for the imagined interaction partner. Then they were randomly assigned to one of the four experimental conditions and exposed to the vignettes that contained the previously entered name. To directly refer to the scenario described in the vignettes, this name was also used throughout the questionnaire (cf. placeholder *Name* in section "Measures"). As some participants in the pretest were concerned that their everyday perception of *Name* might influence their answer patterns, the participants in the main study were instructed to only refer to the behavior of *Name* in the previously read situation and not to their general perception of *Name* in their answers. On the next two pages, the three dependent

variables and the participants' phubbing behavior were measured. The questionnaire ended with stimulus-related questions (attention check, manipulation check, and an involvement measure).

3.3 Measures

Attentiveness. Participants rated to what extent they perceived their interaction partner as attentive on a 7-point scale, ranging from 1 (*completely disagree*) to 7 (*completely agree*). The four items ("*Name* seemed involved in the conversation," "*Name* behaved animatedly during the conversation," "*Name* seemed to listen carefully", and "*Name* seemed interested in the emotions and needs of others") were taken from Norton's (1978) communicator style measure and adapted to fit the context of the vignettes. The scale showed a good internal consistency (α = .83, M = 5.40, SD = 1.14).

Politeness. Politeness was measured using the three items "*Name* behaved inappropriately," "*Name* behaved politely," and "*Name* seems like a decent person" (Trees & Manusov, 1998; Vanden Abeele et al., 2016). Participants responded to these items on a scale from 1 (*completely disagree*) to 7 (*completely agree*) that showed a good level of internal consistency (α = .80, M = 5.44, SD = 1.26).

Conversational quality. Seven items measuring perceived conversational quality were also taken from Vanden Abeele et al. (2016) and based on existing scales (Lowry, Roberts, Romano, Cheney, & Hightower, 2006; Swaab, Postmes, Neijens, Kiers, & Dumay, 2002). The items – such as "*Name* and I have chosen the right options" and "The conversation was useful" – were ranged from 1 (*completely disagree*) to 7 (*completely agree*) and reached an excellent internal consistency (α = .90, M = 5.41, SD = 1.13).

Phubbing behavior. Information about how the participants use their own smartphone during f2f conversations was collected using the phubbing scale (Karadağ et al., 2015), ranging from 1 (*never*) to 7 (*often*). It consists of two subscales, measuring (1) how often participants disturb f2f communications by using their smartphone and (2) how often they feel strongly involved with their mobile device. For the purpose of this study, only the first subdimension consisting of five items (e.g., "My eyes start wandering on my phone when I'm together with others"; α = .61, M = 3.26, SD = 0.92) was relevant.

Attention check. To test whether the participants read the vignettes carefully, a question regarding the topic of the conversation was used. The participants could choose between three different answers, of which only one was correct.

Manipulation check. Moreover, it was checked whether the participants noticed the different types of smartphone use. Thus, they were asked whether the interaction partner used his/her smartphone and, if used, for what reason it had been used. This question had three possible answers, of which one was correct for each group (proactive: "The reason was not mentioned," reactive: "Because the smartphone rang," integrative: "To retrieve information about the destination").

Involvement in the vignettes. Additionally, participants were asked how well they could imagine the situation described in the vignettes. They responded to this single item on a scale ranging from 1 (*not at all*) to 5 (*very good*).

3.4 Participants

In total, 473 participants completed the questionnaire. In the process of data cleaning, those who spent less than 49 seconds reading the vignette (i.e., the minimum reading time defined within the pretest; see section "Design and Manipulation") and/or who answered the stimulus-related attention and manipulation check incorrectly were excluded from data analysis (n = 71). This led to a final sample of N = 402 ($n_{\text{integrative}}$ = 110, $n_{\text{proactive}}$ = 84, n_{reactive} = 98, n_{control} = 110)[1] that consisted of 78% female (n = 315) and 22% male (n = 87) student smartphone users. On average, they were 23.04 (SD = 2.84) years old. The participants spent about two minutes (M = 119.46 seconds) reading the vignettes and showed a high degree of involvement (M = 4.30, SD = 0.89) with the described scenario.

4. Results

Data were analyzed using the statistics software R (see files "dataset," "codebook," "syntax," and "output" on OSF). For testing H1a–c, H2a–c, and H3a–c, a multivariate analysis of variance was performed which indicated a statistically significant effect of the experimental manipulation on all three dependent variables, $F(9, 963.91) = 15.20$, $p < .001$; *Wilk's* $\Lambda = .72$, $\eta^2 = .10$. Univariate tests indicated that the type of smartphone use significantly affected perceived attentiveness, Welch's $F(3, 211.09) = 40.91$, $p < .001$, $\eta_p^2 = .37$, politeness, Welch's $F(3, 207.17) = 26.08$, $p < .001$, $\eta_p^2 = .27$, and conversational quality, $F(3, 398) = 14.87$, $p < .001$, $\eta_p^2 = .10$. Thus, the effects of using a smartphone during f2f communication differed depending on the way the device was used (see appendix, Table 1 and Figure 1 for group-specific descriptives). To determine whether these differences were in line with expectations, planned contrasts were performed afterward (see appendix, Table 2).

For testing H1a–c, the control condition (contrast coefficient: –1) was contrasted with the reactive (contrast coefficient: 0.5) and the proactive (contrast coefficient: 0.5) conditions. This contrast revealed significant differences for attentiveness, Welch's $t(271.29) = -9.98$, $p < .001$, $r = -.52$, politeness, Welch's $t(279.97) = -8.29$, $p < .001$, $r = -.44$, and conversational quality, $t(398) = -5.50$, $p < .001$, $r = .27$. The differences in mean values were in line with H1a–c: When an interaction partner interrupted the f2f conversation by pro- and reactively us-

1 The unequal group sizes indicate that the exclusion rate was disproportionately higher for the proactive (n = 32) and the reactive (n = 22) condition than for the control (n = 11) and the integrative (n = 6) condition. As many cases were excluded based on a combination of both criteria (incorrect attention/manipulation checks and < 49 seconds reading time), this might be explained in two ways: Firstly, the high exclusion rate in these two conditions could indicate the difficulty in remembering whether the smartphone was used pro- or reactively. Whereas participants easily remembered whether the smartphone was integrated into the f2f conversation or not used at all, different reasons for an interruption were more difficult to remember. Secondly, the participants in these two conditions might be unmotivated to expose themselves to a conversation in which their interaction partner negatively violated their communicative expectations and did not enjoy reading the story until the end. Importantly, these unequal group sizes did not limit the robustness of the statistical tests performed given the calculation of Welch's adjusted F ratio for variables with variance heterogeneity.

ing the smartphone, his/her attentiveness and politeness as well as the conversational quality were rated more negatively compared to conversations where no smartphone was used.

When directly comparing the proactive (contrast coefficient: –1) and the reactive condition (contrast coefficient: 1), there was a significant effect for conversational quality, $t(398) = 2.44$, $p = .023$, $r = .12$. In line with H2c, proactive smartphone use ($M = 4.83$, $SD = 1.13$) led to a more negative appraisal of the overall conversational quality than reactive use ($M = 5.23$, $SD = 1.13$). As there were no significant differences for attentiveness, Welch's $t(169.92) = 1.10$, $p = .408$, $r = .08$, and politeness, Welch's $t(170.94) = –0.93$, $p = .403$, $r = –.07$, H2a and H2b need to be rejected.

To test whether integrating a smartphone in conversations led to more positive outcomes than conversations where no smartphone was used, the integrative (contrast coefficient: 1) and the control condition (contrast coefficient: –1) were compared. Contrary to H3a–c, there were no significant differences, neither for attentiveness, Welch's $t(206.27) = 0.13$, $p = .898$, $r = .01$, nor for politeness, Welch's $t(202.94) = –0.84$, $p = .403$, $r = –.06$, or conversational quality, $t(398) = –0.43$, $p = .667$, $r = –.02$.

In H4a–c, it was postulated that the frequency of individuals' own phubbing behavior influences how they evaluate the attentiveness and politeness of a smartphone-using interaction partner as well as the overall conversational quality. To test this assumption, linear regression analyses were calculated to predict each of the dependent variables based on phubbing behavior (see appendix, Table 3). Within these analyses, participants' gender, age, and involvement in the vignette served as control variables. Participants in the control condition ($n = 110$) were excluded from these analyses, as they read a vignette in which the interaction partner did not use a smartphone. As none of these regression equations yielded statistical significance (attentiveness: $b = –0.03$, $p = .735$; politeness: $b = –0.01$, $p = .949$; conversational quality: $b = 0.02$, $p = .809$), H4a–c had to be rejected.

In the previous analyses, perceived attentiveness, politeness, and conversational quality were predicted by two different variables: the type of smartphone use an interaction partner performs (H1, H2, and H3) and someone's own phubbing behavior (H4). Instead of being conceptualized as independent predictors, it could be that users' own phubbing behavior moderates the effects of an interaction partners (proactive, reactive, or integrative) smartphone use on the respective outcome variables. To test this assumption, two additional predictors – type of smartphone use and the interaction of phubbing behavior and type of smartphone use – were integrated into the above-mentioned regression analyses (see appendix, Table 4). The same patterns were found in all three analyses: Whereas the type of smartphone use significantly predicted attentiveness ($b = 0.72$, $p = .020$), politeness ($b = 0.76$, $p = .038$), and conversational quality ($b = 0.69$, $p = .023$), neither phubbing behavior (attentiveness: $b = 0.06$, $p = .844$; politeness: $b = 0.28$, $p = .408$; conversational quality: $b = 0.27$, $p = .330$) nor the interaction term (attentiveness: $b = –0.03$, $p = .763$; politeness: $b = –0.09$, $p = .383$; conversational quality: $b = –0.08$, $p = .346$) reached statistical significance.

5. Discussion

Given the distinction between the different types of smartphone use, this paper is among the first that investigated the effects of using a smartphone during f2f communication in a nuanced manner. Instead of only focusing on conversations in which smartphone users phub their interaction partners, a rather understudied form of usage behavior was additionally considered. As the integration of smartphones in everyday conversations has been increasingly observed (e.g., DiDomenico et al., 2018; Ictech, 2019; Raclaw et al., 2016; Vanden Abeele et al., 2019), this study offers deeper insights into the effects of co-present smartphone use. Moreover, it contributes to previous research on mobile etiquettes, as it explained the consequences of different usage types based on the EVT (Burgoon, 1993).

Supporting H1a–c, reactive and proactive smartphone use by one interaction partner decreased the perceived attentiveness, politeness, and conversational quality. Thus, consistent with previous findings (e.g., Chotpitayasunondh & Douglas, 2018; Kelly et al., 2017; Vanden Abeele & Postma-Nilsenova, 2018), interrupting a f2f communication due to smartphone use was interpreted as a violation of communicative expectations and had a negative impact on communication outcomes. In line with H2c, whether the nature of this interruption was proactive or reactive made a difference: Results showed that the proactive smartphone use led to a more negative appraisal of the overall conversational quality than a reactive one. This greater tolerance toward responsive usage behavior might indicate that participants understood the interaction partner's social obligation of having to reply immediately to incoming signals of a smartphone. Thus, it would be interesting to examine to what extent the internalized expectation of permanent availability moderates the influence of proactive or reactive smartphone use on perceived conversational quality.

Contrary to H2a and H2b, proactive and reactive smartphone users were not perceived as differently attentive and polite. However, all participants who incorrectly answered the attention check question regarding the reason for interruption were excluded from data analysis. Therefore, these lacking differences cannot be traced back to the vignettes' inability to portray such fine gradations in the type of smartphone usage. The explanation could rather be as follows: While Vanden Abeele et al. (2016) found significant differences between proactive and reactive smartphone use when the conversation was interrupted three times, the vignettes used in this study introduced merely one interruption. In line with this argumentation, interrupting a conversation three times (Vanden Abeele et al., 2016) resulted in larger mean value differences and effect sizes than the vignettes used in this study. Importantly, this single interruption still caused differences in perceived politeness, attentiveness, and conversational quality between conversations in which a smartphone was used (proactively or reactively) and those where no smartphone was used (see H1a–c). Consequently, proactively and reactively using a smartphone was interpreted as a violation of communicative expectations. The non-significant findings regarding H2a and H2b demonstrate that the perceived extent of this negative violation did not differ depending on whether this interruption occurred pro- or reactively. Considering the differences between

these two reasons for an interruption, it could be that the perceived attentiveness and politeness of an interaction partner is only affected by the repeated use of smartphones when the positive/negative interpretation of several violated expectations overlap. Further research is needed to check this assumption by systematically varying the number of interruptions.

Furthermore, it should be discussed why integrating a smartphone into f2f communication did not increase the perceived interaction partner's attentiveness, politeness, and the overall conversational quality (H3a–c). Instead, it resulted in the same communication outcomes as if the interaction partner behaved in line with expectations and did not use a smartphone. Compared to expectancy confirmations, violating communicative norms is theorized as being either more beneficial or more detrimental for communication outcomes – depending on whether the violation is evaluated positively or negatively (Burgoon, 1993). Consequently, if integrating a smartphone into a f2f communication was interpreted as an expectancy violation, it would not have led to the same outcomes as conversations in which no smartphone was used. It seems that using smartphones during f2f communication is not perceived as a violation of communicative expectations per se. Thus, the rejection of H3a–c provides deeper insights into the nature of communicative expectations: Likely, using smartphones during f2f communication is only interpreted as a violation when it entails divided attention of the interaction partner and therefore hinders the reciprocal communication process. This is only the case if a smartphone user pro- or reactively interrupts the f2f conversation and keeps the device and its content to him-/herself. However, as integrative use is associated with joint attention, it seems to be in line with communicative expectations. To test this assumption, future research on media etiquettes should investigate which type of smartphone use is perceived as socially (in)appropriate instead of using unspecific questions such as "Do you think it is generally okay or not okay for people to use their cellphones?" (Rainie & Zickuhr, 2015).

Moreover, results raise the question of why participants' phubbing behavior did neither predict nor moderate the perceived attentiveness (H4a) and politeness (H4b) of their smartphone-using interaction partner or the overall conversational quality (H4c). In these hypotheses, phubbing behavior was theorized as an indicator of communicative expectations which should influence the interpretation process of the violated expectation. However, results showed that the smartphone-using interaction partner and the conversational quality were rated equally, independent of the frequency of individuals' own phubbing behavior. Thus, heavy phubbers might have also perceived the smartphone use of their interaction partner as a violation of communicative expectations and evaluated the conversation outcomes as negatively as those who rarely phub. Even though self-reported data revealed that individuals who often phub their interaction partners perceive the use of smartphones as normatively appropriate (Chotpitayasunondh & Douglas, 2016; Schneider & Hitzfeld, 2019), they might still feel subconsciously offended when they are phubbed by someone else. This could indicate that frequent phubbing does not increase the tolerance toward others' smartphone usage behavior. However, this study did not directly test whether the frequency of phubbing behavior is a valid indicator of communicative expectations. Moreover, expectancy

violations were only implicitly inferred from perceived attentiveness, politeness, and conversational quality. Future research should therefore measure communicative expectations and their violation directly to examine how individuals' (descriptive and injunctive) norms influence the evaluation process of an interaction partner's smartphone use during f2f communication.

Finally, some methodological limitations that negatively affect the generalizability of the findings should be discussed. Firstly, the presented results are based on a non-representative/convenience sample that is limited to students. As both intensity of smartphone use (Rosen, Whaling, Carrier, Cheever, & Rokkum, 2013) and media etiquettes vary according to age (Forgays et al. 2014), future research should cover a broader age spectrum. Secondly, as this study focused on conversations between close friends, more research is needed to examine the effects of integrative smartphone use in other types of relationships (e.g., romantic relationships, family relationships, and between acquaintances). Thirdly, to avoid confounding effects, this study only investigated conversations in same-sex dyads. Thus, it would be interesting to vary gender composition and compare the effects for same- and cross-sex dyads. Fourthly, despite the advantages that using vignettes can provide in terms of internal validity (i.e., easily controlling for third variables and minimizing confounding effects), their external validity needs to be discussed: On the one side, the vignettes used in this study simulated a conversation taking place in a natural setting and were – especially due to the free choice of name for the interaction partner – more externally valid than studies conducted in laboratory settings. On the other side, compared to field experiments, these vignettes lack in external validity as participants only judged a fictional conversation in which they did not actively participate. Even though recent studies in this field have often used vignettes (e.g., Chotpitayasunondh & Douglas, 2018, Vanden Abeele & Postma-Nilsenova, 2018), this study should be replicated by simulating "real" f2f conversations between the participants and a confederate.

Lastly, this study only focused on two factors that might influence how copresent smartphone use can be interpreted – the type of smartphone use and someone's own phubbing behavior. This extended previous research on smartphone use and communicative expectations and provided important insights into the causal effects of different usage types on conversation outcomes. However, these two factors only represent one small component in the complex process of evaluating violated expectations. When addressing the question of smartphones' beneficial or detrimental effects, other additional cues could be important: For instance, how long and how often an interruption occurs, whether the interaction partner apologizes for using his/her smartphone, how many cognitive resources the respective activity with the smartphone requires, and whether it is used for social (e.g., chatting with a friend) or non-social (e.g., looking for train connections) purposes. Consequently, many open issues have not been addressed in this paper, which emphasizes that phubbing is an important communicative phenomenon that needs to be further investigated.

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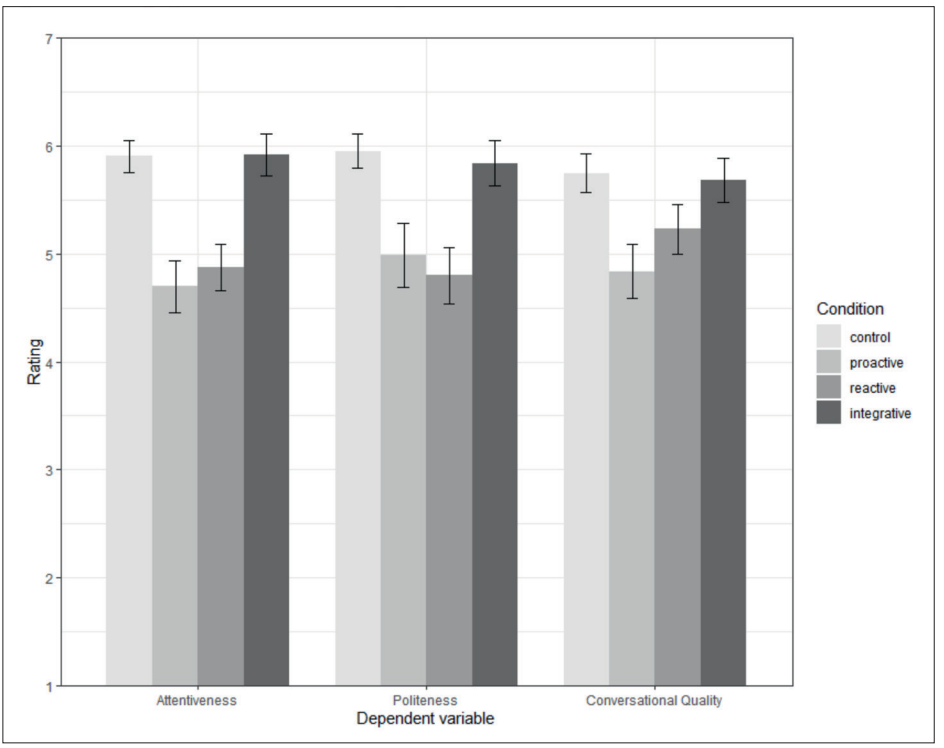
Appendix

A1. Figures

Figure 1. *Group-specific means for all dependent variables with 95% CIs*



A2. Tables

Table 1. Group-specific means, standard deviations, and range

DV	Type of use	*M*	*SD*	Range
Attentiveness	No	5.90	0.81	3.75
	Proactive	4.70	1.12	5.50
	Reactive	4.88	1.06	4.75
	Integrative	5.92	1.02	6.00
	Total	5.40	1.14	6.00
Politeness	No	5.95	0.85	4.00
	Proactive	4.98	1.37	5.33
	Reactive	4.80	1.29	5.67
	Integrative	5.84	1.12	5.67
	Total	5.44	1.26	5.67
Conversational Quality	No	5.75	0.97	4.43
	Proactive	4.84	1.13	5.00
	Reactive	5.23	1.13	5.00
	Integrative	5.69	1.08	6.00
	Total	5.41	1.13	6.00

Note. DV = Dependent variable.

Table 2. Planned contrasts for type of smartphone use

	Contrast 1						Contrast 2						Contrast 3					
DV	Voc	*SE*	*t*	*df*	*p*	*r*	Voc	*SE*	*t*	*Df*	*p*	*r*	Voc	*SE*	*t*	*df*	*p*	*r*
Attentiveness[b]	–1.12	.11	–9.98	271.29	< .001	–.52	0.18	.16	1.10	169.92	.408	.08	0.02	.12	0.13	206.27	.898	.01
Politeness[b]	–1.06	.13	–8.29	279.97	< .001	–.44	–0.19	.20	–0.93	170.94	.403	–.07	–0.11	0.13	–0.84	202.94	.403	–.06
Conversational-Quality[a]	–0.71	.13	–5.50	398	< .001	.27	0.39	.16	2.44	398	.023	.12	–0.06	0.15	–0.43	398	.667	–.02

Note. DV = Dependent variable/ Voc = Value of contrast.
Contrast 1 = no use (–1) vs. proactive use (0.5) vs. reactive use (0.5) vs. integrative use (0).
Contrast 2 = no use (0) vs. proactive use (–1) vs. reactive use (1) vs. integrative use (0).
Contrast 3 = no use (–1) vs. proactive use (0) vs. reactive use (0) vs. integrative use (1).
[a] = assuming equal variances/ [b] = not assuming equal variances.

Table 3. Linear regression analyses predicting attentiveness, politeness, and conversational quality with phubbing behavior

	Attentiveness				Politeness				Conversational Quality			
Predictor	*b*	*SE*	*t*	*p*	*b*	*SE*	*t*	*p*	*b*	*SE*	*t*	*p*
Constant	4.91	.73	6.73	< .001	5.31	.82	6.49	< .001	3.62	.69	5.27	< .001
Phubbing Behavior	–0.03	.08	–0.34	.735	–0.01	.09	–0.06	.949	0.02	.08	0.24	.809
Gender	0.09	.18	0.52	.605	–0.17	.20	–0.83	.410	0.06	.17	0.35	.726
Age	–0.02	.03	–0.64	.522	–0.01	.03	–0.38	.706	–0.00	.02	–0.09	.930
Involvement	0.15	.08	1.93	.055	0.09	.09	1.06	.291	0.37	.07	4.99	< .001
	R^2 = .015, $F(4, 286)$ = 1.06, p = .376				R^2 = .008, $F(4, 286)$ = 0.58, p = .676				R^2 = .080, $F(4, 286)$ = 6.26, p = < .001			

Note. N = 292. b = unstandardized regression coefficient.

Table 4. Linear regression analyses predicting attentiveness, politeness, and conversational quality with phubbing behavior and type of smartphone use

	Attentiveness				Politeness				Conversational Quality			
Predictor	b	SE	*t*	*p*	b	SE	*t*	*p*	*b*	SE	*t*	*p*
Constant	2.60	1.14	2.28	.023	2.91	1.36	2.14	.034	1.43	1.13	1.26	.208
Phubbing Behavior	0.06	0.29	0.20	.844	0.28	0.34	0.83	.408	0.27	0.28	0.98	.330
Type of smartphone use	0.72	0.31	2.34	.020	0.76	0.37	2.08	.038	0.69	0.30	2.28	.023
Gender	0.08	0.17	0.49	.625	–0.18	0.20	–0.89	.373	0.05	0.16	0.33	.745
Age	–0.01	0.02	–0.37	.714	–0.01	0.03	–0.22	.829	0.00	0.02	0.10	.918
Involvement	0.14	0.07	1.93	.055	0.08	0.09	0.99	.322	0.36	0.07	5.11	<.001
Phubbing behavior * type of smartphone use	–0.03	0.09	–0.30	.763	–0.09	0.11	–0.87	.383	–0.08	0.09	–0.94	.346
	$R^2 = .196$, $F(6, 284) = 11.56$, $p < .001$				$R^2 = .086$, $F(6, 284) = 4.46$, $p < .001$				$R^2 = .167$, $F(6, 284) = 9.52$, $p = < .001$			

Note. $N = 292$. b = unstandardized regression coefficient.