



The quality of face-to-face and digitally mediated social interactions: two experience sampling studies exploring the moderating role of physical location, interaction partner familiarity, and interaction purpose

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Abstract

This study examines how communication modality influences social interaction quality and its contingency on three other situational characteristics: physical location, partner familiarity, and interaction purpose. Data from two experience sampling studies including 385 Spanish emerging adults and 10,203 social interaction reports revealed that compared to face-to-face interactions, phone calls were rated higher, video calls showed no significant difference, and text-based and social media interactions (e.g., commenting) were rated lower. However, other situational factors mattered. For example, video calls at home were perceived as higher in quality than face-to-face, whereas face-to-face was superior outside the home. For partner familiarity, social media interactions with weak (vs. strong) ties were of significantly lower quality. For interaction purpose, texting was superior to face-to-face in leveraging social interaction quality when having negative (vs. maintenance) interactions. Combined, the results thus plead for greater consideration of the situation when examining the effects of (mediated) interpersonal communication.

Lay Summary

During COVID-19 lockdown(s), how often did you wonder if video calls were similar in quality to face-to-face conversations, particularly when working at home or calling friends and family members? Or have you ever thought about whether messaging with friends is as good as meeting up face-to-face? Our article examines these associations, looking at how we perceive the quality of our social interactions differently depending on the channel through which we interact. Nearly 400 participants took part in our study, registering more than 10,000 social interactions through questionnaires that they answered on their smartphones several times per day. This kind of data allows us to explore social interactions as experienced right after they occur. Contrary to some prior research, our analyses found that face-to-face interactions are not always of higher quality than digital interactions, as phone calling was on average perceived as highest in quality. Additionally, exploring the role of the physical location, interaction partner familiarity, and the purpose of the interaction, we found important nuances in the associations between interaction channels and perceived interaction quality. Together, these findings help to uncover the specific circumstances for having good conversations through specific channels.

Keywords: social interaction quality, modality, situation, interaction partner familiarity, interaction purpose.

Everyday social interactions play an essential role in the formation, maintenance, and development of human relationships (Duck, 1990; Goldsmith & Baxter, 1996). Technological developments have reshaped the way we socially interact, facilitating digitally mediated interactions in a variety of modalities, such as via video calls, phone calls, text-based exchanges, and interactions on social media. These digital interactions have not displaced face-to-face interactions (Hall, 2020): Overall, people seem to interact more than ever. Nonetheless, a gap persists in understanding the distinct benefits that different communication modalities provide to the quality of people's interactions and to what extent these are situational.

The question of whether face-to-face and digitally mediated interactions differ in terms of their quality continues to be crucial to address because a large proportion of contemporary interactions takes place online (Hall, 2020) and concerns

over the quality of these interactions remain. For instance, questions persist on whether mediated interactions play a role in rising levels of loneliness (Cacioppo & Cacioppo, 2018; Hall et al., 2023).

The question regarding the circumstances under which high-quality interactions are facilitated is pertinent given increasing evidence that the "situation" matters (Schnauber-Stockmann et al., 2024). To date, however, the role of the situation in shaping (mediated) social experiences remains largely unexplored (Karnowski, 2020). As Schnauber-Stockmann et al. (2024) argue, this is unfortunate as media uses and effects are likely contingent on the (1) media context, (2) users' psychological states, and (3) subjective and objective environmental contexts. In this study, we focus on this relatively underexplored area, examining how the effect of the media context—specifically the modality of the interaction—is moderated by three situational characteristics

pertaining to the environmental context: physical location and two interpersonal dimensions, namely interaction partner familiarity and interaction purpose (Karnowski, 2020; Reis, 2008).

With this focus on situational characteristics, this article aims to extend earlier theories on mediated interpersonal communication, which have primarily focused on modality (for an overview see e.g., Walther, 2011) yet have given less consideration to how situational factors might moderate its effects. This article aims to support earlier claims that social interaction modalities, physical locations, partners, and interaction purposes are not independent from each other (Hall & Davis, 2017; Hall, 2020): Individuals may employ different modalities when interacting with different interaction partners in different places and for different purposes. Revealing these patterns can foster greater understanding of the role of situation in explaining the relational implications of mediated communication.

To achieve this aim, the current study draws from two experience sampling studies examining 10,203 social interactions collected from 385 Spanish emerging adults. Experience sampling is a particularly suitable method because the iterative questionnaires can reveal both between- and within-person patterns while reducing the risk of retrospective bias and optimizing ecological validity (Bolger & Laurenceau, 2013). Emerging adults are a particularly relevant population because they are known to blend their online and offline social spheres, resulting in a significant overlap and fluid movement between face-to-face and mediated interactions (Hall, 2020; Trepte et al., 2018). This population thus lends itself well to explore at the within-person level how moment-to-moment evaluations of social interaction quality fluctuate based on four situational features of the interaction: the modality (comparing face-to-face communication with video calling, phone calling, text messaging, and interactions on social media platforms), physical location, interaction partner familiarity, and interaction purpose.

Mediated communication and interaction quality

Social interaction quality is the central outcome of interest in this study. Social interaction quality lacks a standardized definition and measurement (Hülür et al., 2023; Liu et al., 2019). Here, we define and operationalize it based on Buber's (1970) concept of the mutual valuation between interaction partners, which considers interactions high in quality when individuals report that they and their interaction partner(s) felt valued and perceived the interaction to have contributed to their relationship (Fernández et al., *in press*). This relationally oriented operationalization is grounded in the fundamental human need to belong (Baumeister & Leary, 1995) and therefore fits well with the study goal of examining how communication modality impacts everyday social interactions.

This study is not the first to examine the effect of communication modality on interaction quality. Already in the late 20th century, theories such as media richness theory (Daft & Lengel, 1986) and social presence theory (Short et al., 1976) questioned if the lack of nonverbal cues in computer-mediated communication (CMC) was detrimental to interaction quality. However, these latter cues-filtered-out theories (see Walther & Parks, 2002) came under scrutiny around the turn

of the millennium. Empirical work increasingly suggested that interaction partners, driven by an innate need to reduce uncertainty and develop affinity, can adapt quite well to the cue limitations of mediated modalities (Walther, 2011). This work led to the development of cues-filtered-in theories (see Walther & Parks, 2002), with social information processing or SIP theory (Walther, 1992) as an influential and widely used foundational theory explaining why computer-mediated interactions can achieve or even surpass the quality of face-to-face interactions, as in the case of hyperpersonal communication (Walther et al., 2015). Over the years, several—mostly experimental—studies have built upon SIP theory, exploring the role of “situation” in the form of message qualities and channel characteristics (Walther et al., 2015). The hybridity with which off- and online interactions are woven into people's social lives, however—as well as their situatedness in everyday life—has been less explored in this strand of research (Hall et al., 2023).

In response to this knowledge gap, Hall and Davis (2017) recently formulated the communicate bond belong or CBB theory. This theory departs from the assumption that relational communication is typically multimodal, with closer partners communicating through multiple modalities (Haythornthwaite, 2005; Taylor & Bazarova, 2021). Exploring both face-to-face and mediated modalities simultaneously—in the context of ongoing relationships—CBB theory considers situational factors beyond the “media context” (see Schnauber-Stockmann et al., 2024). It focuses on the fundamental need to belong to understand human relationships (Baumeister & Leary, 1995), suggesting that social interactions satisfy individuals' need to belong while simultaneously spending their social energy (Hall & Davis, 2017). High-quality social interactions, then, are those that promote a better belongingness to energy ratio (Hall, 2018). A central implication of CBB is that this ratio is dynamic across situations: What is “best” can depend on situational factors, such as which modality you use, with whom you talk to, for what purpose, and in which location.

Drawing on CBB theory, a recent exploration of which mediated modalities satisfy the need to belong the most in everyday life showed the primacy of face-to-face vs. other mediated modalities for connection (Hall et al., 2023). This finding is consistent with previous qualitative and quantitative studies that have persistently emphasized the higher quality of face-to-face over mediated interactions (see Hall, 2020).

Most of the extant evidence, however, either compares face-to-face communication with one mediated modality of communication (e.g., messaging, Trepte et al., 2018; video calling, Croes et al., 2019), lumps mediated communication modalities together (e.g., Bayer et al., 2021), or only uses situational factors as control variables (e.g., location, Dogruel & Schnauber-Stockmann, 2021; familiarity, Hall et al., 2023; purpose, Hall, 2020). Hence, our first goal is thus to explore if our study supports the primacy of face-to-face communication when including a larger variety of mediated forms of communication. Because specific mediated modalities differ widely in the cue systems they give access to (Fox & McEwan, 2017), we do not lump different modalities together, but rather treat them separately in their comparison with face-to-face communication (Hall et al., 2023), hypothesizing that (a) video calls, (b) phone calls, (c) text-based exchanges, and (d) interactions on social media platforms

will be perceived as lower in quality than face-to-face interactions at the within-person level (H1).

Examining the role of the situation

But what happens when we also factor other situational characteristics into the equation? Given the inherent complexity of social life and the diverse contexts in which interactions occur, it is essential to take these into account to better understand under which conditions digitally mediated interactions are particularly advantageous or disadvantageous compared to face-to-face interactions. In the following sections we introduce three features of the situation that, based on the literature (e.g., Reis, 2008), are likely to matter: physical location, interaction partner familiarity, and interaction purpose.

Physical location

The advent of the mobile internet has facilitated mediated communication without temporal and spatial restrictions (Olson-Buchanan & Boswell, 2006). This anytime and anyplace connectivity has changed the structures of everyday life (Vanden Abeele et al., 2018), challenging the conventional link between social interactions and the physical locations in which they take place (Thulin et al., 2020). While (mediated) social interactions might now occur virtually anywhere, this does not imply that all interactions are experienced equally across locations (see also Reis, 2008): Physical location can directly impact the perceived quality of interactions, for instance by influencing how individuals process (social) information (Semin and Smith, 2013).

The physical location might influence how mediated interactions are experienced (Karnowski, 2020). There are reasons to assume that the quality gap between face-to-face and mediated interactions is wider in locations outside home (i.e., at public places, work, or someone else's home) than inside the home. Three key mechanisms might explain this moderating effect: When not at home, interaction partners might have to deal with (1) physical constraints, such as noise or distractions, that may for instance make it harder to follow or concentrate on communication—especially when it involves synchronous video or voice (Choi et al., 2014); (2) the presence of others, which may hinder private conversations or create concerns about being overheard (Campbell, 2008); and (3) social norms, which may limit the appropriateness or perceived quality of mediated interactions in certain public environments (Rimal & Lapinski, 2015). Thus, we hypothesize that at the within-person level the primacy of face-to-face communication over other modalities in social interaction quality (see H1) will be greater when social interactions take place at (a) work, (b) someone else's home, and (c) in public places, versus at home (H2).

Interaction partner familiarity

The dynamics of social interaction are also profoundly influenced by the pre-existing relationship between interaction partners (Duck, 1990; Elmer et al., 2023; Hall, 2020). Describing the interpersonal core of social situations, Reis (2008) assigns a primary role to the interaction partner familiarity in directly shaping interpersonal experiences: The need to form and maintain relationships motivates individuals to engage in (high-quality) social interactions (Baumeister & Leary, 1995), and communicating with close partners is

especially effective in satisfying this need through higher quality interactions (Hall & Davis, 2017). Research indeed consistently shows that stronger familiarity corresponds to higher interaction quality ratings (e.g., Bayer et al., 2021; Hall et al., 2023). Interestingly, strong ties are also found to communicate through more diverse modalities, and using less-common mediated modalities may indicate higher closeness (Haythornthwaite, 2005; Taylor & Bazarova, 2021). Thus, tie strength might (partially) drive the association between modality and quality, emphasizing the potential moderation of interaction partner familiarity.

It is likely that the quality gap between face-to-face and mediated interactions might be wider for weak ties (i.e., non-close friends or family members, acquaintances, strangers) than for strong ties (i.e., close friends and family). After all, while mediated interactions can still pose challenges due to the limited access to social cues (Han et al., 2024; Walther, 1992), the difference in perceived quality between mediated and face-to-face interactions may be more pronounced for weak ties. Specifically, weak ties lack the relational depth needed for mediated interactions to match the quality of face-to-face communication (Walther, 1992). Without sufficient prior knowledge of the partner, individuals must rely more on their own interpretations, which may hinder the perception of high-quality interactions—particularly when quality is defined in terms of mutual valuation. Thus, we hypothesize that at the within-person level the primacy of face-to-face communication over other modalities in social interaction quality (see H1) will be greater when the interaction partner is a (a) friend, (b) acquaintance, and (c) stranger versus a close friend/family member (H3).

Interaction purpose

Finally, we examine interaction purpose as a final situational factor. Reis (2008) already suggested that from the individual's perspective, the purpose people aim to accomplish through the interaction is a key aspect of the social situation. CBB theory further developed this perspective, identifying several interaction purposes that may directly impact social interaction quality: Interactions may, for instance, have “striving” purposes (which fulfill the need to belong), but interactions may also serve more “mundane” purposes, such as relationship maintenance, address work-related matters, or even support negative purposes like complaining, with the latter especially harming connection and well-being (Hall & Davis, 2017; Hall, 2018).

There is evidence suggesting that interaction purposes may also interact with modality in affecting social interaction quality. Especially when an interaction is emotionally charged with very positive (i.e., striving purposes) or negative emotions (i.e., negative purposes), communicating via an asynchronous, text-based modality may be superior to face-to-face communication, as CMC affordances such as editability and controllability may make these potentially uncomfortable, less common, and emotionally intense exchanges easier to navigate through. There is some support for this assumption. For instance, Trepte et al. (2018) found text-based interactions are favored for the purposes of self-disclosure and receiving social support, a finding that also resonates with Valkenburg and Peter's (2009) Internet-enhanced self-disclosure hypothesis, which builds on SIP theory (Walther, 1992) to argue that the reduced cues of CMC environments might benefit intimate self-disclosure. As such, negative interactions

might also be better experienced through mediated modalities because of the reduced synchronicity and limited social cues. Thus, we hypothesize that at the within-person level the primacy of face-to-face communication over other modalities in social interaction quality (see H1) will become weaker when pursuing striving and negative purposes versus interactions with maintenance purposes (H4).

Method

To investigate our four hypotheses, we use data collected from two experience sampling studies capturing a total of 15,903 momentary questionnaires, registering 10,203 social interactions ($T_1 = 4,572$; $T_2 = 5,631$) in populations of emerging adults in Spain ($N_1 = 129$; $N_2 = 256$).

Participants and procedure

The first sample consisted of a cohort of 129 Spanish emerging adults (aged 18–25, $M_{age} = 20.72$, $SD_{age} = 2.09$, women = 63.6%) and the second of 256 Spanish emerging adults (aged 18–25, $M_{age} = 23.13$, $SD_{age} = 1.89$, women = 83.2%). Table 1 shows some additional sociodemographic information.

For the first sample, participants engaged in a two-week experience sampling study from March 21 to April 3, 2022. They received eight questionnaires daily via the Ethica app (Ethica Data Services Inc.), with a 55% compliance rate (7,375 completed questionnaires) and 4,572 interactions recorded (62% of responses). Individuals were eligible if they were (a) aged 18–25, (b) residents of Spain, and (c) owned a smartphone. Questionnaires were semi-randomly triggered between 9:00 and 21:50, with a 60-minute completion window and two reminders. To incentivize participation, 120 €10, 10 €15, and 10 €30 Amazon vouchers were distributed according to the participation rate. This study received ethical approval from the Ethical Committee of the University of Navarre (approval number 2021.190).

In the second study, participants engaged in a six-week experience sampling study, receiving five questionnaires daily. They completed 8,528 questionnaires (72% compliance), registering 5,631 interactions (66%). As the study implemented an intervention aimed at enhancing the quality of face-to-face interactions starting from day 11, we used data from the initial 10 days (March 21–30, 2022). Participants were

recruited by an external company (Netquest) and incentivized with vouchers up to €55. The inclusion criteria, contingency, and procedure were the same as for Sample 1. This study received ethical approval from the Ethical Committee of the University of Navarre (approval number 2021.191). The project codebooks, detailing the complete study design and procedures for both studies, are available in Open Science Framework (OSF, <https://osf.io/z2c7n/>).

Measures

Both studies used identical experience sampling measures. In the analyses of this article, we focused on seven specific variables about social interactions reported by participants within the last 10 minutes. This time frame is within the recommendations for momentary assessments (Bolger & Laurenceau, 2013; Stone & Shiffman, 2002) and is commonly used in the literature (e.g., Hall et al., 2023). To reduce the amount of experience sampling questions, rather than asking participants a screening question whether they had engaged in a social interaction, we made interaction modality the first question of the social interaction part and included a “no interaction” option. If participants selected a specific modality, follow-up questions about the social interaction were triggered; if they reported no interaction, they were sent to the end of the questionnaire.

Interaction modality

Interaction modality was assessed by asking participants “How did you conduct the most recent social interaction within the last 10 minutes?” with the response options “no interaction,” “phone call,” “video call,” “face-to-face,” “social media,” and “text or chat” (as classified by Baym et al., 2004). Acknowledging the academic debate around when social media interactions are effectively social interactions (Hall, 2023) and that participants could interpret modalities in different ways, we instructed them to categorize video calls, phone calls, and messages that took place within social media platforms as video calls, phone calls, or text or chat instead of social media interactions.

Interaction quality

Interaction quality was measured with the following three items: “Did you feel valued by your interaction partner in your most recent social interaction?” “Do you think your interaction partner felt valued by you in your most recent social interaction?” and “Do you consider that after your most recent social interaction, the relationship with your interaction partner ...” (Fernández et al., in press). The first two items were rated on a scale from 1 = “not at all” to 7 = “very much,” whilst the scale of the third was from 1 = “worsened a lot” to 7 = “strengthened a lot.” This theory-driven approach (Buber, 1970) emphasizes the relational dynamic of the interaction, deriving quality from how the interaction partner valued each other (items 1–2) and examining the impact of the specific interaction on their relationship (item 3). We used these three items as manifest variables of a latent interaction quality measure. The within-person omega estimate for quality was for Sample 1 $\omega_{within} = .85$ (CI [.84, .86]) and for Sample 2 $\omega_{within} = .84$ (CI [.83, .85]), indicating a high level of internal consistency of the scale items within individuals for both samples. Similarly, the between-person omega estimate yielded for Sample 1 a value of $\omega_{between} = .93$ (CI [.91, .96]) and for Sample 2 $\omega_{between} = .96$ (CI [.95, .97]).

Table 1. Socio-demographic information of both samples.

	Sample 1		Sample 2	
	Number	Proportion (%)	Number	Proportion (%)
Socioeconomic class				
Lower	1	1	3	1
Lower-middle	15	12	78	30
Middle	50	39	148	58
Upper-middle	55	43	27	58
Upper	8	6	0	0
Relationship status				
Single	95	74	113	44
Partnered	34	26	143	56
Occupation				
Studying	93	72	93	36
Studying and working	24	19	57	22
Working or other situations	12	9	106	42

Physical location

Location was assessed by asking participants for their location when they answered the questionnaires. Answer options included “at home,” “someone else’s home,” “work/university,” “public space,” “public transport,” “other indoors,” and “other outdoors” (as classified by Baym et al., 2004). We compared the effect of “being at home” with other physical locations of social interactions. To simplify the statistical analyses and their interpretations, we merged two categories as public places (public spaces and public transport) and two as “other” (other indoors and other outdoors).

Interaction partner familiarity

Interaction partner familiarity was measured with the question “Who were you interacting with in your most recent social interaction?” Participants were required to choose from four categories: “close family/friend,” “family/friend,” “acquaintance,” and “stranger” (as classified by Hall, 2018).

Interaction purpose

Interaction purpose was assessed using an established taxonomy (Goldsmith & Baxter, 1996; Hall, 2018), encompassing the following purposes: “gossip,” “making plans,” “joking around,” “catching up,” “small talk,” “task talk,” “work or school talk,” “meaningful conversation,” “conflict or disagreement,” “expressing love or affection,” “complaining or venting,” and “other.” We included “hanging out” to better capture informal socializing. We employed the categories used by the CBB theory (Hall, 2018), classifying these purposes into four groups: striving (meaningful talk, expressing love or affection, catching up, and joking around), maintenance (gossip, hanging out, making plans, small talk and task talk), work-related, and negative interactions (conflict and complaining).

Analysis plan

Although the analyses for this study were not pre-registered, we replicated analytical decisions recently made by Hülür et al. (2023), who examined the moderation role of interaction purpose in a population of older adults¹. To examine H1, we estimated a multilevel structural equation model (MSEM) with dummy variables for the different interaction modality as predictors of interaction quality on the within-person level, with face-to-face as the reference category to examine differences between each mediated modality and face-to-face interactions. We also included (main-effect) dummy variables for physical location, interaction partner familiarity, and purpose as predictors at the within-person level, with the “at home” category serving as the reference category for location, “close friends/family” for partner, and “maintenance” for purpose.

To test H2, we estimated MSEM models, extending the MSEM model for H1 by including the within-level interaction between modality and physical location dummy variables, to examine whether the location moderated the association between modality and perceived quality. Following Hülür et al.’s (2023) decisions, these models involved pairwise comparisons of interaction modalities and included the relevant subsets of the data for each model: face-to-face and the corresponding mediated modality (video calls, phone calls, text-based interactions, and social media). To examine H3 and H4, we estimated the same MSEM models as for H2, replacing physical location with interaction partner

familiarity (H3) and purpose (H4) in the interaction terms with modality.

Age, biological sex (0 = man, 1 = woman), relational status (0 = single, 1 = in a relationship), and a sample dummy variable (0 = Sample 1, 1 = Sample 2) were included as between-level covariates in all the analyses. In addition, following recent recommendations and exclusion criteria adopted by Hülür et al. (2023), we included all available data into our analyses, refraining from excluding participants based on a compliance threshold (Jacobson, 2020). We used MPlus version 8.11 (Muthén & Muthén, 1998) for all analyses. As both datasets were very much alike in terms of sample characteristics and the content of items, we decided to merge the samples for our analyses, thereby increasing the statistical power, and conduct some robustness analyses.

Results

Table 2 displays the number, proportion, and mean quality of social interactions categorized by modality, physical location, interaction partner familiarity, and purpose. Considering the two samples together, our participants reported social interactions in 64% of questionnaires ($n = 10,203$). Of these interactions, 68% were face-to-face interactions ($n = 6,950$), 4% were video calls ($n = 384$), 5% phone calls ($n = 552$), 19% text-based interactions ($n = 1,931$), and 4% were social media exchanges ($n = 386$). The most common location for social interactions was at home (53%, $n = 5,374$) and in terms of the interaction partner familiarity, most interactions occurred with close friends and family members (58%, $n = 5,885$). Regarding the purpose, most of the registered interactions were conducted for maintenance purposes (48%, $n = 4,845$).

Additionally, Table 2 reports the distribution of interactions across different modalities, locations, purposes, and interaction partners. The most interesting features of these distributions are the following: The data show that over two-thirds of mediated interactions took place at home, ranging from 68% for video calls to 78% for social media interactions. In contrast, only 44% of face-to-face interactions occurred at home. Roughly 60% of the face-to-face interactions, phone calls, and text-based interactions were with close friends or family members; however, this proportion was notably lower for video calls (38%) and social media interactions (36%). Instead, compared to the other modalities, video calls were more frequently conducted with acquaintances (38%), while social media interactions involved strangers at a higher rate (19%). Finally, video calls (43%) and phone calls (41%) were slightly more commonly used for striving purposes compared to other modalities. Moreover, only 22% of video calls were for maintenance purposes, lower than the 41% to 55% observed in other modalities. Additionally, 30% of video calls were work-related, a much higher percentage than the 4% to 13% reported for other modalities.

Do digitally mediated interactions differ in quality from face-to-face interactions?

We hypothesized that (a) video calls, (b) phone calls, (c) text-based exchanges, and (d) interactions on social media platforms would be perceived as lower in quality than face-to-face interactions at the within-person level (H1). Table 3 and Figure 1 present the results of the model investigating

Table 2. Descriptive statistics of modality, physical location, interaction partner familiarity, and interaction purpose.

Variable	Descriptives			Modality				Location				Familiarity				Purpose						
	Occurrence	Q ⁻		FtF	VC	PC	Txt	SM	Ho	OH	Wo	PS	OL	CF	Fr	Acq	Str	St	Ma	Wr	Ne	OP
Interaction modality																						
Face-to-face (FtF)	6,950 (71%)	5.08							44%	8%	24%	14%	10%	58%	22%	16%	3%	31%	50%	13%	2%	4%
Video call (VC)	384 (3%)	5.04							68%	3%	9%	16%	4%	38%	17%	38%	7%	43%	22%	30%	1%	4%
Phone call (PC)	552 (4%)	5.24							70%	2%	11%	13%	4%	64%	16%	11%	9%	41%	41%	13%	3%	3%
Texting (Txt)	1,931 (18%)	5.02							72%	1%	11%	10%	5%	61%	26%	11%	1%	35%	45%	12%	4%	3%
Social media (SM)	386 (4%)	4.69							78%	2%	7%	11%	2%	36%	26%	19%	19%	35%	55%	4%	1%	5%
Physical location																						
Home (Ho)	5,374 (53%)	5.06	56%	5%	7%	26%	6%							71%	18%	8%	2%	36%	49%	7%	3%	4%
Other's home (OH)	616 (6%)	5.42	91%	2%	1%	4%	1%							69%	20%	10%	1%	34%	55%	7%	1%	3%
Work (Wo)	2,015 (20%)	4.93	83%	2%	3%	11%	1%							25%	35%	35%	5%	22%	38%	36%	2%	2%
Public space (PS)	1,383 (13%)	5.06	73%	5%	5%	15%	3%							51%	22%	19%	8%	34%	52%	8%	2%	5%
Other location (OL)	814 (8%)	5.15	84%	2%	3%	11%	1%							51%	24%	18%	7%	36%	48%	9%	3%	5%
Interaction partner familiarity																						
Close friend/family (CF)	5,885 (58%)	5.27	69%	2%	6%	20%	2%		65%	7%	9%	12%	7%					38%	51%	4%	4%	4%
Friend/family (Fr)	2,312 (22%)	4.90	67%	3%	4%	22%	4%		43%	5%	30%	13%	8%					30%	51%	15%	2%	3%
Acquaintance (Acq)	1,604 (16%)	4.74	69%	9%	4%	13%	4%		27%	4%	44%	16%	9%					21%	33%	43%	1%	3%
Stranger (Str)	402 (4%)	4.19	58%	6%	12%	6%	18%		33%	1%	25%	26%	14%					15%	41%	28%	2%	14%
Interaction purpose																						
Maintenance (Ma)	4,844 (47%)	5.00	71%	2%	5%	18%	4%		54%	7%	16%	15%	8%	62%	24%	11%	3%					
Striving (St)	3,341 (33%)	5.36	64%	5%	7%	20%	4%		58%	6%	14%	14%	9%	67%	21%	10%	2%					
Work-related (Wr)	1,354 (13%)	4.82	68%	8%	5%	18%	1%		30%	3%	54%	8%	5%	16%	25%	51%	8%					
Negative (Ne)	265 (3%)	4.29	61%	1%	6%	30%	2%		68%	2%	12%	10%	8%	78%	14%	5%	3%					
Other purpose (OP)	399 (4%)	4.68	73%	4%	4%	15%	5%		60%	4%	8%	18%	10%	58%	16%	12%	14%					

Note: Q⁻ = Total sample mean of interaction quality [1-7].

this association. In line with our hypothesis, text-based interactions ($b = -0.075$, $SE = 0.038$, $p = .048$) and exchanges through social media platforms ($b = -0.369$, $SE = 0.133$, $p = .006$) were associated with lower quality than face-to-face interactions. Contrary to our hypothesis, the results indicated that phone calls ($b = 0.215$, $SE = 0.052$, $p < .001$) were associated with higher quality than face-to-face interactions. We did not find significant differences between video calls and face-to-face interactions ($b = 0.162$, $SE = 0.091$, $p = .073$). See Figure 2 for a visualization of individual fluctuations of interaction quality by modality for two participants.

Does the situation matter?

We hypothesized that physical location (H2), interaction partner familiarity (H3) and interaction purpose (H4) would moderate the association between modality and social interaction quality. Regarding location, we more specifically hypothesized that the primacy of face-to-face interactions in quality over other modalities would be greater at (a) work, (b) someone else's home, and (c) at public places than when at home (H2). Table 4 and Figure 3 present the results of the models exploring this moderation. Although we did not find any significant difference in interaction quality between video calls and face-to-face communication (see H1), when location moderation was included in the model, we did: In line with H2, video calling was superior to face-to-face interactions ($b = 0.382$, $SE = 0.102$, $p < .001$) when interactions took place at home (reference category), yet less superior when at someone else's home ($b = -1.085$, $SE = 0.267$, $p < .001$), at work ($b = -0.546$, $SE = 0.230$, $p = .018$), at public places ($b = -0.887$, $SE = 0.215$, $p < .001$), and at other locations ($b = -0.930$, $SE = 0.282$, $p = .001$; see Figure 3 for point estimates illustrating these moderation effects). Similarly, the primacy of face-to-face over text-based interactions was more pronounced in public places ($b = -0.279$, $SE = 0.102$, $p = .006$) and other places ($b = -0.278$, $SE = 0.118$, $p = .019$); as well as over social media when interactions occurred at someone else's home ($b = -1.102$, $SE = 0.407$, $p = .007$). Location did not moderate all modality effects: Phone calling kept the same primacy over face-to-face communication (see Table 4 for details).

With respect to interaction partner familiarity, we hypothesized that at the within-person level the primacy of face-to-face interactions over other modalities in leveraging social interaction quality would matter less for interactions with close friends/family than for those with less familiar interaction partners (H3). Table 5 and Figure 3 present the results of the models exploring this moderation. Counter to our expectations (see H1), video calling was superior to face-to-face communication ($b = 0.415$, $SE = 0.115$, $p < .001$) when interacting with a close friend or family member (reference category). In line with H3, however, video calling was less superior to face-to-face communication when social interactions involved acquaintances ($b = -0.510$, $SE = 0.151$, $p = .001$) compared to close friends/family members. Similarly, the primacy of face-to-face interactions over social media interactions became more pronounced when interacting with an acquaintance ($b = -0.667$, $SE = 0.244$, $p = .006$) or stranger ($b = -1.274$, $SE = 0.274$, $p < .001$) compared to a close friend/family member. Finally, interaction partner familiarity did not moderate the primacy of face-to-face communication over phone calling and texting (see Table 5 for details).

Finally, regarding interaction purpose, we hypothesized that at the within-person level the primacy of face-to-face communication over other modalities in social interaction quality would become weaker for interactions with striving and negative purposes versus interactions with maintenance purposes (H4). Table 6 and Figure 3 present the results of the moderation analyses. Two significant moderation effects were identified, both involving text-based and social media interactions with negative purposes. Supporting H4, interactions conducted via texting ($b = 0.520$, $SE = 0.242$, $p = .031$) and social media ($b = 1.318$, $SE = 0.462$, $p = .004$) were rated higher in quality than face-to-face interactions for negative (vs. maintaining) purposes. However, no significant moderations were observed for interactions with negative purposes between face-to-face and phone or video calls. Similarly, we found no significant moderations for striving purposes across any of the four mediated modalities (see Table 6 for details).

Robustness analyses

We conducted several robustness analyses. First, we reanalyzed the samples individually. We found only small differences in the patterns when employing different samples, which may be due to the decrease in statistical power for these analyses. Second, we included the sample as a moderator across the main associations explored on each model. The results remained robust. Third, we controlled for participants' compliance rate as a covariate, and we found the same patterns in the results. We reported the results of the supplementary analyses and the same figures shown in this article in the OSF folder (<https://osf.io/z2c7n/>).

Discussion

Drawing from two experience sampling studies that, combined, leveraged 10,203 social interaction reports, this study examined the within-person association between interaction modality and interaction quality, comparing face-to-face communication with video calls, phone calls, text-based interactions, and interactions via social media platforms. Furthermore, this study explored how this association varies according to three other situational factors: physical location, interaction partner familiarity, and interaction purpose.

In line with recent work (Hall, 2020; Hall et al., 2023; Hall et al., 2023), our analyses revealed that, overall, face-to-face interactions were associated with higher quality than text-based and social media exchanges. However, we consistently found phone calling was rated higher in quality than face-to-face communication, and that video calling was superior in some models (i.e., when at home vs. elsewhere and when video calling a close friend compared to an acquaintance). The primacy of phone calling is consistent with recent findings in adult (Hall et al., 2023; Hall et al., 2023) and older adult samples (Hülür et al., 2023). A tentative explanation for the lack of primacy of face-to-face compared to video calls and phone calls may rest on media multiplexity theory (Haythornthwaite, 2005), which states that the breadth of modalities used is greater for close than for weak ties, with the modality of making calls (whether via video or phone) being typically more prevalent among close ties that are also regularly met with offline (e.g., Baym et al., 2004). Thus, one might hypothesize that our participants used video calls and phone calls mostly with local interaction partners they were

Table 3. Within-level association between interaction modality and interaction quality (H1).

Predictors	Social interaction quality		
	Estimate	SE	<i>p</i> -value
Within-person level			
<i>Interaction modality (ref. face-to-face)</i>			
Video call (H1)	0.162	0.091	.073
Phone call (H1)	0.215***	0.052	.000
Text (H1)	-0.075*	0.038	.048
Social media (H1)	-0.369**	0.133	.006
<i>Interaction location (ref. at home)</i>			
Someone else's home	0.352***	0.054	.000
Work	0.073*	0.036	.046
Public place	0.157***	0.040	.000
Other	0.267***	0.045	.000
<i>Interaction partner familiarity (ref. close friend/family)</i>			
Friend/family	-0.263***	0.039	.000
Acquaintance	-0.599***	0.052	.000
Stranger	-1.167***	0.096	.000
<i>Interaction purpose (ref. maintenance)</i>			
Striving	0.361***	0.033	.000
Work-related	-0.067	0.050	.182
Negative	-0.815***	0.118	.000
Other	-0.169*	0.067	.012
Between-person level			
Gender (ref. men)	0.004	0.093	.968
Age (in years)	-0.004	0.021	.834
Dating (ref. single)	0.236**	0.083	.005
Sample (ref. Sample 1)	-0.036	0.100	.719

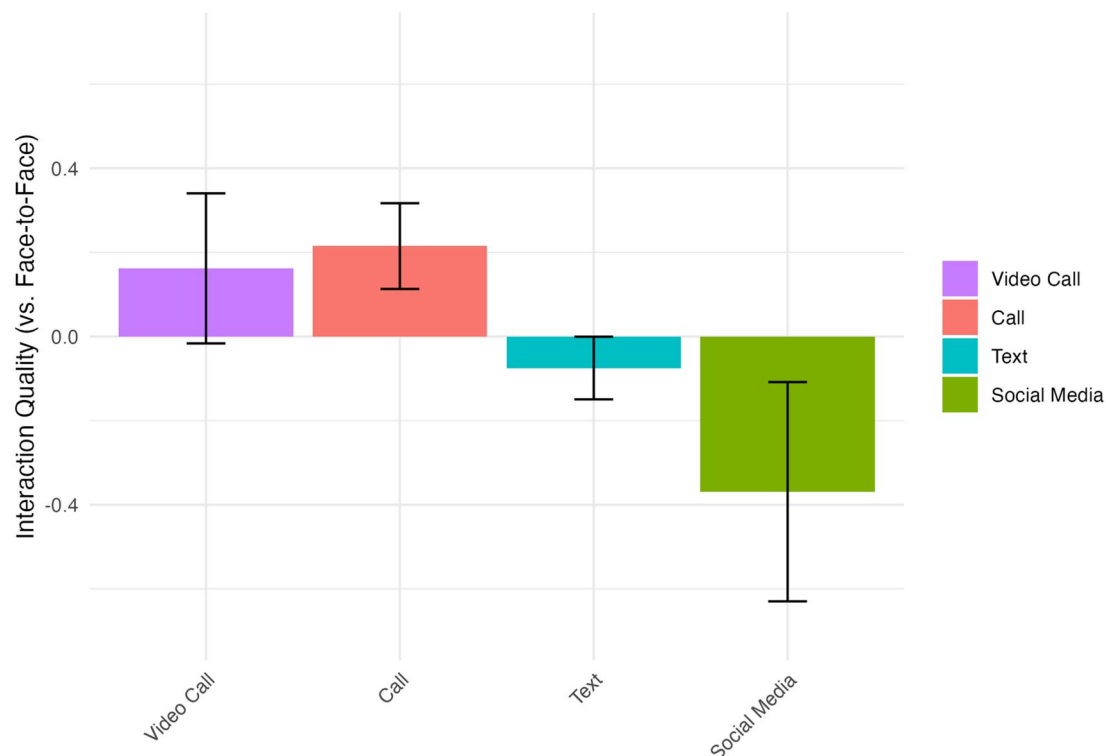
Note: Significant associations of H1 are shown in bold. Significance of estimates:

- * $p < 0.05$;
- ** $p < 0.01$;
- *** $p < 0.001$.

close with (Taylor & Bazarova, 2021), thus explaining their higher social interaction quality.

However, it may not be just about interaction partner familiarity: After all, our data showed a similar proportion of close tie interactions between face-to-face interactions and phone/video calls, thus still not explaining the superiority of phone calling and—when at home—video calling. We did observe differences in interaction purpose, however: 41% of voice calls and 43% of video calls served a striving purpose, compared to only 31% of face-to-face interactions; whereas almost 50% of face-to-face interactions served the more mundane purpose of relational maintenance which was less common for phone calls (41%) and especially video calls (22%). This may indicate that when individuals chose to interact with a close tie via a phone or video call, they may do this more deliberately for striving purposes, thus leveraging more high-quality interactions through these modalities. Alternatively, the higher proportion of striving interactions may stem from the very characteristics of calling. Previous work describes how calls are considered more intrusive and demand greater commitment from the interaction partner (Yang et al., 2014). Similarly, previous empirical findings suggest that people exert additional effort in video calls to compensate for the reduced social cues (see Croes et al., 2019), which might increase their quality. All this may explain why calling leverages more social interaction quality.

For video calling in particular, it was noticeable that location was a powerful situational moderator: While video calling at home leveraged more social interaction quality than face-to-face communication, the pattern was reversed for interactions occurring outside the home. Referring to the findings of Croes et al. (2019), a tentative explanation may

**Figure 1.** Estimated differences and 95% confidence intervals in interaction quality between face-to-face interactions and four mediated modalities.

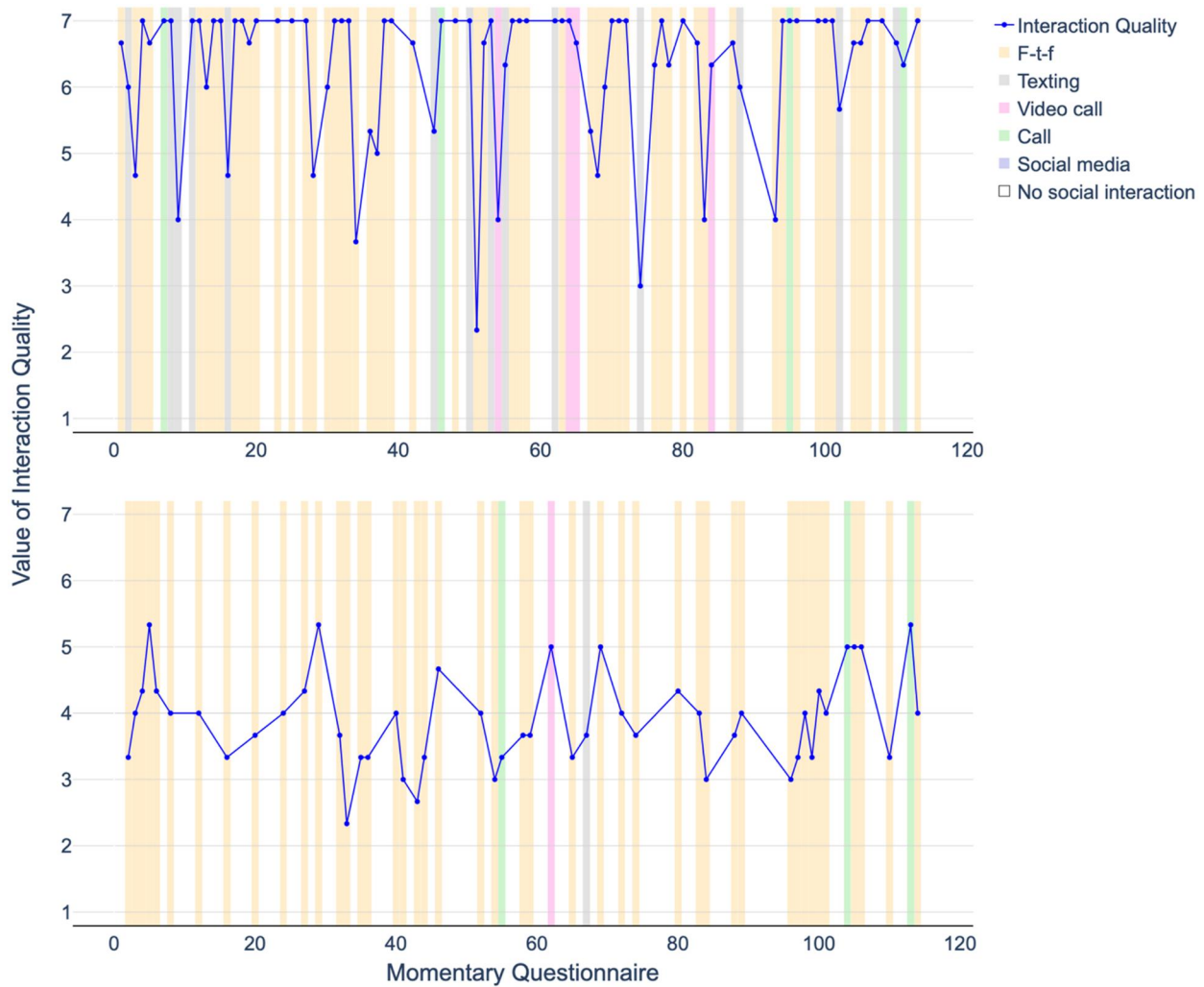


Figure 2. Fluctuations of interaction quality (in blue) for two participants with interaction modality categories as background color indicators.

be that outside the home it may be harder to engage in exaggerated affinity cues due to a combination of physical constraints, presence of others, and social norms. Additionally, striving interactions, which leverage more relationship quality, occurred predominantly at home (see Table 1), and thus video calling at home may mostly serve that purpose, while serving other purposes outside the home, therefore leveraging more relationship quality there.

With respect to interaction partner familiarity—across all our analyses—a consistent pattern emerged: The stronger the ties with the interaction partner, the higher the quality of social interactions. This finding supports existing research that the pre-existing relationship profoundly influences social interactions (Duck, 1990; Hall, 2020). There were also some interaction effects between partner familiarity and modality that shed interesting light on the nature of mediated interactions. Although our expectation that the primacy of face-to-face communication would become less pronounced when interacting with close friends and partners was true for CMC communication (i.e., texting and social media interactions), we found the reverse for video calling—again supporting its special role in the communication repertoires of close friends and family members.

A major limitation of our study that needs to be mentioned here is that we did not include romantic partners in

the familiarity categorization. This is unfortunate as interactions with romantic partners have unique characteristics that warrant a distinct category (Hall, 2020; Taylor & Bazarova, 2021). The between-person findings of our study showed that, across all models, participants with a romantic relationship (46%) reported higher interaction quality than single participants. The effects found in our study for interactions with close friends/family may be (at least partly) driven by romantic interactions. For future research, we suggest including this type of relationship when measuring interaction partners familiarity, or alternatively, using a continuous variable measuring the established relationship or closeness between interaction partners (e.g., Bayer et al., 2021).

Finally, as already suggested above, interaction purpose also mattered. We found the expected direct effects, with striving interactions contributing to greater social interaction quality and negative interactions reducing it, which aligns with the core assumptions of CBB theory (Hall & Davis, 2017; Hall, 2018). Overall, interaction purpose did not override the primacy effect of video and phone calling over face-to-face communication. However, partially supporting our hypothesis, communicating via text or social media did become superior to face-to-face communication when

Table 4. Within-level moderation of interaction location in the association between interaction modality and interaction quality (H2).

Predictors	Social interaction quality							
	(FtF vs Video call)		(FtF vs Phone call)		(FtF vs Text)		(FtF vs Social media)	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Within-person level								
<i>Interaction location (ref. at home)</i>								
Someone else's home	0.438***	0.057	0.434***	0.059	0.438***	0.059	0.424***	0.059
Work	0.093*	0.043	0.073	0.043	0.101*	0.041	0.088*	0.043
Public place	0.240***	0.045	0.23***	0.045	0.251***	0.044	0.246***	0.045
Other	0.320***	0.055	0.313***	0.055	0.319***	0.053	0.323***	0.055
<i>Interaction partner familiarity (ref. close friend/family member)</i>								
Friend or family	-0.252***	0.046	-0.254***	0.045	-0.266***	0.039	-0.252***	0.046
Acquaintance	-0.557***	0.054	-0.521***	0.058	-0.545***	0.053	-0.597***	0.058
Stranger	-0.980***	0.097	-0.993***	0.093	-0.978***	0.097	-1.241***	0.107
<i>Interaction purpose (ref. maintenance)</i>								
Striving	0.368***	0.037	0.362***	0.034	0.360***	0.033	0.360***	0.036
Work-related	0.048	0.051	0.047	0.053	0.040	0.050	0.107	0.056
Negative	-1.024***	0.144	-1.012***	0.141	-0.840***	0.122	-0.997***	0.145
Other	-0.115	0.074	-0.120	0.069	-0.145*	0.064	-0.114	0.071
Moderation of physical location								
Modality (ref. FtF & at home)	0.382***	0.102	0.296***	0.063	0.006	0.042	-0.307*	0.140
Modality X Someone else's home (H2)	-1.085***	0.267	-0.246	0.392	-0.279	0.188	-1.102**	0.407
Modality X Work (H2)	-0.546*	0.230	-0.276	0.147	-0.086	0.086	0.061	0.261
Modality X Public place (H2)	-0.887***	0.215	-0.256	0.160	-0.279**	0.102	-0.383	0.372
Modality X Other (H2)	-0.930**	0.282	-0.083	0.274	-0.278*	0.118	0.323	0.667
Between-person level								
Gender (ref. men)	-0.008	0.098	-0.002	0.098	-0.029	0.095	0.000	0.096
Age (in years)	-0.005	0.022	-0.004	0.022	-0.002	0.021	-0.003	0.022
Dating (ref. single)	0.252**	0.087	0.247**	0.087	0.236**	0.086	0.260**	0.087
Sample (ref. Sample I)	-0.079	0.104	-0.078	0.104	-0.038	0.103	-0.032	0.104
Number of observations	7,317		7,486		8,865		7,320	

Note: Significant associations of H2 are shown in bold. Significance of estimates:

- * p < 0.05;
- ** p < 0.01;
- *** p < 0.001.

communicating for negative purposes. This finding supports previous empirical evidence drawing on SIP theory (Walther, 1992), suggesting that for emotionally charged and negatively valenced communication, the reduced cues of CMC, i.e., its a-synchronicity, editability, and controllability, have merit. Contrary to these findings, Hülür et al. (2023) found that interactions related to conflicts were perceived more negatively in their quality (regarding valence, social relatedness, and calmness) when they were carried out by text versus face-to-face in older adults, suggesting generational differences in how mediated modalities may be experienced.

In conclusion, two broader observations can be made from the overall findings. First, our findings underscore the recent argument of Schnauber-Stockmann et al. (2024) that the “situation” matters: Differences in social interaction quality resulted from differences between interaction modalities, but also from the direct effects of other situational factors; furthermore, the effects of interaction modality were themselves moderated by situational characteristics, either amplifying, mitigating, or even reversing them. Hence, interpreting modality effects without considering contextual factors—particularly in relation to interaction quality—can be misleading. As suggested by Schnauber-Stockmann et al. (2024)’s categorization, there are likely many more specific characteristics of daily interactions that could be explored in future research. Identifying such situational factors, however, can easily become a never-ending endeavor as there might always be

another situational characteristic to explore. Here, researchers should prioritize situational characteristics that meaningfully extend theoretical frameworks, for instance that explain findings counterintuitive to established theories.

On that front, we see the second overall contribution of the current study as extending CMC theories such as SIP theory (Walther, 1992) as well as Hall and Davis’ (2017) CBB theory. With respect to CMC theories, our study supports the general assumption that CMC is different from face-to-face communication, but that mediated interactions are not necessarily (dramatically) poorer at leveraging social interaction quality. By showing more specifically that phone calling and—under the right conditions—video calling contribute to greater social interaction quality than face-to-face communication, our study indicates that, in people’s harried everyday lives, these forms of synchronous communication may serve particularly well fulfilling belongingness needs, among others because of their intrusiveness and the commitment they demand. As such, our study findings also extend CBB theory, in showing that although the main effect of interaction purpose stands, it is subjected to modality effects.

Limitations and future directions

Our study is not without limitations. First, although we used a large ESM dataset, providing sufficient statistical power to detect significant within-person associations between categorical variables, the sample consists exclusively of emerging adults.

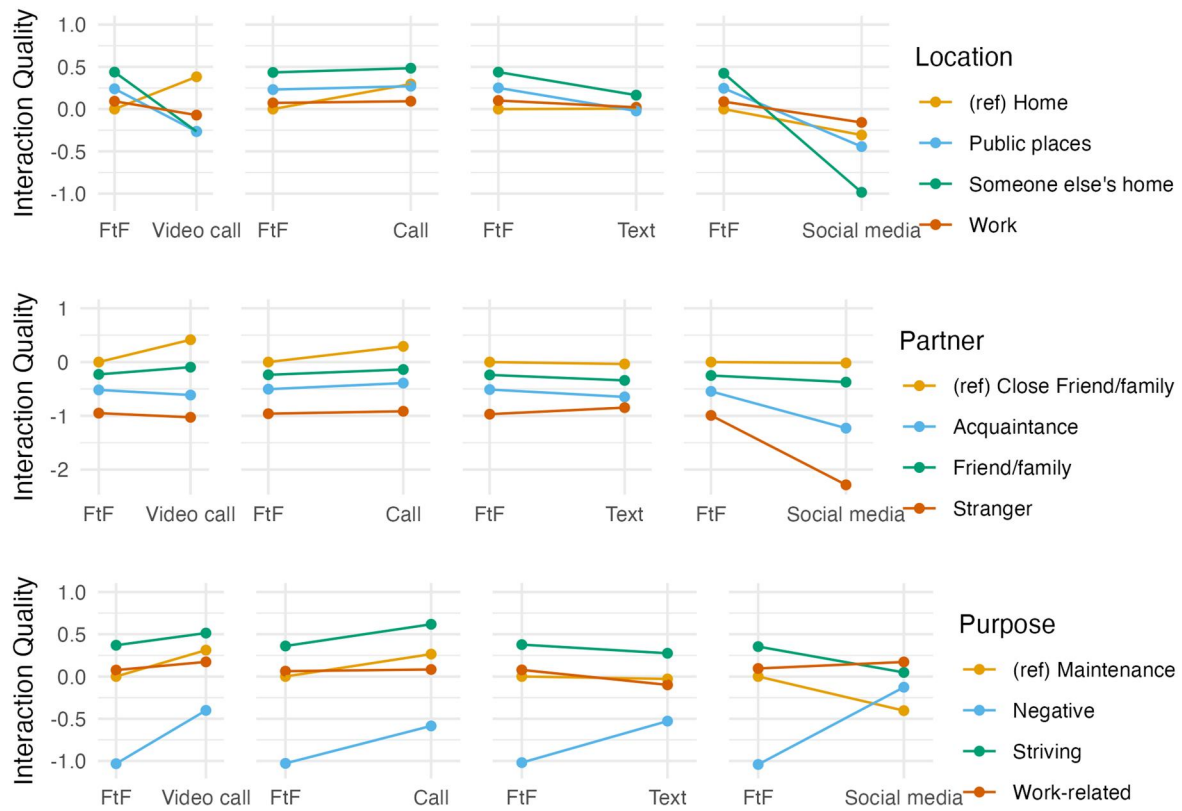


Figure 3. Predicted values of two-way interactions in which location (first row), interaction partner familiarity (second row), and purpose (third row) moderate the effect of modality on interaction quality.

Note. Reference category is face-to-face together with the reference category indicated in the legend.

Table 5. Within-level moderation of interaction partner in the association between interaction quality and interaction modality (H3).

	Social interaction quality							
	(FtF vs Video call)		(FtF vs Phone call)		(FtF vs Text)		(FtF vs Social media)	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Within-person level								
<i>Interaction location (ref. at home)</i>								
Someone else's home	0.402***	0.055	0.424***	0.058	0.405***	0.055	0.410***	0.057
Work	0.049	0.042	0.053	0.042	0.062	0.037	0.072	0.043
Public place	0.195***	0.045	0.208***	0.044	0.187***	0.040	0.206***	0.046
Other	0.285***	0.053	0.300***	0.053	0.267***	0.048	0.307***	0.054
<i>Interaction partner familiarity (ref. close friend/family member)</i>								
Friend/family member	-0.229***	0.047	-0.237***	0.048	-0.239***	0.046	-0.250***	0.047
Acquaintance	-0.518***	0.059	-0.504***	0.059	-0.511***	0.057	-0.545***	0.058
Stranger	-0.950***	0.102	-0.960***	0.100	-0.969***	0.099	-0.992***	0.099
<i>Interaction purpose (ref. maintenance)</i>								
Striving	0.362***	0.037	0.360***	0.034	0.360***	0.033	0.357***	0.036
Work-related	0.078	0.052	0.051	0.053	0.047	0.049	0.078	0.055
Negative	-1.025***	0.144	-1.011**	0.141	-0.846***	0.122	-1.008***	0.145
Other	-0.108	0.074	-0.121	0.069	-0.148*	0.064	-0.142	0.073
Moderation of interaction partner								
Modality (ref. FtF & close partner)	0.415***	0.115	0.292***	0.065	-0.036	0.046	-0.017	0.097
Modality X Friend/family (H3)	-0.281	0.220	-0.193	0.158	-0.066	0.070	-0.106	0.202
Modality X Acquaintance (H3)	-0.510**	0.151	-0.179	0.195	-0.101	0.112	-0.667**	0.244
Modality X Stranger (H3)	-0.492	0.280	-0.247	0.225	0.158	0.282	-1.274***	0.294
Between-person level								
Gender (ref. men)	0.002	0.098	0.000	0.098	-0.026	0.095	-0.001	0.097
Age (in years)	-0.007	0.022	-0.004	0.022	-0.002	0.021	-0.004	0.021
Dating (ref. single)	0.255**	0.088	0.247**	0.087	0.237**	0.086	0.270**	0.087
Sample (ref. Sample I)	-0.085	0.104	-0.076	0.104	-0.040	0.103	-0.047	0.105
Number of observations	7,317		7,486		8,865		7,320	

Note: Significant associations of H3 are shown in bold. Significance of estimates:

- * $p < 0.05$;
- ** $p < 0.01$;
- *** $p < 0.001$.

Table 6. Within-level moderation of interaction purpose in the association between interaction quality and interaction modality (H4).

	Social interaction quality							
	(FtF vs Video call)		(FtF vs Phone call)		(FtF vs Text)		(FtF vs Social media)	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Within-person level								
<i>Interaction location (ref. at home)</i>								
Someone else's home	0.399***	0.056	0.421***	0.058	0.402***	0.055	0.408***	0.057
Work	0.057	0.042	0.053	0.042	0.060	0.035	0.084*	0.042
Public place	0.197***	0.046	0.207***	0.044	0.188***	0.041	0.226***	0.045
Other	0.289***	0.054	0.301***	0.053	0.265***	0.048	0.318***	0.054
<i>Interaction partner familiarity (ref. close friend/family member)</i>								
Friend/family member	-0.240***	0.046	-0.248***	0.045	-0.253***	0.040	-0.248***	0.046
Acquaintance	-0.551***	0.057	-0.514***	0.058	-0.528***	0.053	-0.592***	0.058
Stranger	-0.974***	0.099	-0.982***	0.093	-0.965***	0.097	-1.222***	0.104
<i>Interaction purpose (ref. maintenance)</i>								
Striving	0.370***	0.036	0.361***	0.036	0.377***	0.035	0.354***	0.036
Work-related	0.076	0.054	0.063	0.054	0.078	0.053	0.095	0.055
Negative	-1.032***	0.147	-1.028***	0.146	-1.019***	0.147	-1.041***	0.148
Other	-0.105	0.071	-0.097	0.070	-0.099	0.069	-0.085	0.070
Moderation of interaction partner								
Modality (ref. FtF & maintenance)	0.312**	0.109	0.265**	0.078	-0.029	0.044	-0.404*	0.182
Modality X Striving (H4)	-0.168	0.162	-0.008	0.109	-0.073	0.056	0.098	0.178
Modality X Work-related (H4)	-0.215	0.179	-0.245	0.195	-0.148	0.101	0.481	0.272
Modality X Negative (H4)	0.319	0.592	0.178	0.449	0.520*	0.242	1.318**	0.462
Modality X Other (H4)	-0.146	0.580	-0.481	0.280	-0.294*	0.145	-0.579	0.410
Between-person level								
Gender (ref. men)	0.009	0.099	-0.002	0.099	-0.024	0.095	0.003	0.097
Age (in years)	-0.007	0.022	-0.004	0.022	-0.003	0.021	-0.004	0.022
Dating (ref. single)	0.257**	0.088	0.249**	0.087	0.240**	0.086	0.265**	0.087
Sample (ref. Sample I)	-0.093	0.104	-0.078	0.105	-0.040	0.102	-0.034	0.104
Number of observations	7,317		7,486		8,865		7,320	

Note: Significant associations of H4 are shown in bold. Significance of estimates:

- * $p < .05$;
- ** $p < .01$;
- *** $p < .001$.

This limits the generalizability of our findings to broader populations and leaves questions surrounding age effects unanswered.

Second, because of the nature of the analyses, we simplified the categorical measures of situational variables. For example, the 12 observed interaction purposes were collapsed into four understandable categories for the moderation analyses. This approach makes the analyses easier to understand; however, also results in a loss of information. Another measurement limitation is that we registered only the location of participants but not of their interaction partners, which probably also is associated with differences in the quality of mediated modalities.

Lastly, the advancement of technological devices has produced blurred lines between the mediated modalities that we assessed. In the future, interaction modalities may be studied using more granulated categorizations including categories such as text with video, image, or audio messages. We gave specific instructions to participants reporting social media interactions. However, we recommend excluding social media as a specific modality in future studies because we understand social media as a platform where specific mediated modalities can (co-)occur, which leads to a lack of clarity when interpreting social media interactions as a category itself.

Conclusion

Notwithstanding these limitations, our study is among the first to explore the within-person associations between

modality and social interaction quality among emerging adults, while also accounting for three other situational factors—physical location, interaction partner familiarity, and interaction purpose. It shows that “situation” plays a key role in the quality of everyday social interactions. In doing so, it extends theoretical understanding of the dynamics of both mediated and face-to-face social interactions.

Note

1. In addition to the population, the two studies have three main differences. Firstly, we included three between-person covariates in all our analyses: age, sex, and being in a relationship. Secondly, we included physical location, interaction partner familiarity, and interaction purpose in our models as covariates, and their interaction terms with modality in the specific moderation analyses. Finally, we used a latent variable of interaction quality instead of exploring different dimensions of quality.

Data availability

Data, preregistration, codes, and robustness analyses are available in the OSF folder (<https://osf.io/z2c7n/>).

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Open science framework badges

Open Materials

The components of the research methodology needed to reproduce the reported procedure and analysis are publicly available for this article.

Open Data

Digitally shareable data necessary to reproduce the reported results are publicly available for this article.

References

- Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, *117*, 497–529. <https://doi.org/10.1037/0033-2909.117.3.497>
- Bayer, J. B., Triêu, P., Ellison, N., Schoenebeck, S. Y., & Falk, E. B. (2021). Rejection sensitivity and interaction quality in everyday life. *Journal of Social and Personal Relationships*, *38*, 3646–3668. <https://doi.org/10.1177/02654075211034237>
- Baym, N. K., Zhang, Y. B., & Lin, M.-C. (2004). Social interactions across media: interpersonal communication on the internet, telephone and face-to-face. *New Media & Society*, *6*, 299–318. <https://doi.org/10.1177/1461444804041438>
- Bolger, N., & Laurenceau, J.-P. (2013). Intensive longitudinal methods: An introduction to diary and experience sampling research. Guilford Press. <https://play.google.com/store/books/details?id=5bD4LuAFq0oC>
- Buber, M. (1970). *I and thou*. Scribner's Sons (W., Kaufmann, trans.).
- Cacioppo, J. T. & Cacioppo, S. (2018) Loneliness in the modern age: An evolutionary theory of loneliness (ETL). In J. Olson (Ed.) *Advances in experimental social psychology* (Vol. 58, pp. 127–197). Academic Press.
- Campbell, S. (2008). Perceptions of mobile phone use in public: The roles of individualism, collectivism, and focus of the setting. *Communication Reports*, *21*, 70–81. <https://doi.org/10.1080/08934210802301506>
- Choi, H. H., Van Merriënboer, J. J., & Paas, F. (2014). Effects of the physical environment on cognitive load and learning: Towards a new model of cognitive load. *Educational psychology review*, *26*, 225–244. <https://doi.org/10.1007/s10648-014-9262-6>
- Croes, E. A. J., Antheunis, M. L., Schouten, A. P., & Kraemer, E. J. (2019). Social attraction in video-mediated communication: The role of nonverbal affiliative behavior. *Journal of Social and Personal Relationships*, *36*, 1210–1232. <https://doi.org/10.1177/0265407518757382>
- Daft, R. L., & Lengel, R. H. (1986). Organizational information requirements, media richness and structural design. *Management Science*, *32*, 554–571. <https://doi.org/10.1287/mnsc.32.5.554>
- Dogruel, L., & Schnauber-Stockmann, A. (2021). What determines instant messaging communication? Examining the impact of person-and situation-level factors on IM responsiveness. *Mobile Media & Communication*, *9*, 210–228. <https://doi.org/10.1177/2050157920943926>
- Duck, S. (1990). Relationships as unfinished business: Out of the frying pan and into the 1990s. *Journal of Social and Personal Relationships*, *7*, 5–28. <https://doi.org/10.1177/02654075900071001>
- Elmer, T., van Duijn, M. A. J., Ram, N., & Bringmann, L. F. (2023). Modeling categorical time-to-event data: The example of social interaction dynamics captured with event-contingent experience sampling methods. *Psychological Methods*. <https://doi.org/10.1037/met0000598>
- Fernández, A., Vanden Abeele, M. M. P., Sádaba, C., García-Mangano, J., Weinstein, N. (in press). Feeling valued as a conversation-specific relational experience: an examination of buber's existential dialogical theory. *The Journal of Positive Psychology*.
- Fox, J., & McEwan, B. (2017). Distinguishing technologies for social interaction: The perceived social affordances of communication channels scale. *Communication Monographs*, *84*, 298–318. <https://doi.org/10.1080/03637751.2017.1332418>
- Goldsmith, D. J., & Baxter, L. A. (1996). Constituting relationships in talk: A taxonomy of speech events in social and personal relationships. *Human Communication Research*, *23*, 87–114. <https://doi.org/10.1111/j.1468-2958.1996.tb00388.x>
- Hall, J. A. (2018). Energy, episode, and relationship: A test of communicate bond belong theory. *Communication Quarterly*, *66*, 380–402. <https://doi.org/10.1080/01463373.2017.1411377>
- Hall, J. A. (2020). *Relating through technology: Everyday social interaction*. Cambridge University Press. <https://play.google.com/store/books/details?id=0PXvDwAAQBAJ>
- Hall, J. A. (2023). What we do in the shadows: The consumption of mobile messaging by social media mobile apps in the twilight of the social networking era. *Mobile Media & Communication*, *11*, 66–73. <https://doi.org/10.1177/20501579221133610>
- Hall, J. A., & Davis, D. C. (2017). Proposing the communicate bond belong theory: Evolutionary intersections with episodic interpersonal communication. *Communication Theory: CT: A Journal of the International Communication Association*, *27*, 21–47. <https://doi.org/10.1111/comt.12106>
- Hall, J. A., Dominguez, J., & Mihailova, T. (2023). Interpersonal media and face-to-face communication: Relationship with life satisfaction and loneliness. *Journal of Happiness Studies*, *24*, 331–350. <https://doi.org/10.1007/s10902-022-00581-8>
- Hall, J. A., Pennington, N., & Merolla, A. J. (2023). Which mediated social interactions satisfy the need to belong? *Journal of Computer-Mediated Communication*, *28*, 1–12. <https://doi.org/10.1093/jcmc/zmac026>
- Han, J., Cores-Sarría, L., & Zhou, H. (2024). In-person, video conference, or audio conference? Examining individual and dyadic information processing as a function of communication system. *Journal of Communication*, *74*, 117–129. <https://doi.org/10.1093/joc/jqae003>
- Haythornthwaite, C. (2005). Social networks and Internet connectivity effects. *Information, Community & Society*, *8*, 125–147. <https://doi.org/10.1080/13691180500146185>
- Hülür, G., Luo, M., Macdonald, B., & Grünjes, C. E. (2023). The perceived quality of social interactions differs by modality and purpose: An event-contingent experience sampling study with older adults. *Journal of Social and Personal Relationships*, *41*, 794–821. <https://doi.org/10.1177/02654075231215269>
- Jacobson, N. C. (2020). Compliance thresholds in intensive longitudinal data: Worse than listwise deletion: Call for action. Society for Ambulatory Assessment, Melbourne, Australia. http://www.nicholasjacobson.com/files/talks/SAA2020_Compliance_Thresholds.pdf

- Karnowski, V. (2020). The nano level of media use: Situational influences on (mobile) media use. In B. Krämer & F. Frey (Eds.), *How we use the media* (pp. 157–168). Springer International Publishing.
- Liu, H., Xie, Q. W., & Lou, V. W. Q. (2019). Everyday social interactions and intra-individual variability in affect: A systematic review and meta-analysis of ecological momentary assessment studies. *Motivation and Emotion*, 43, 339–353. <https://doi.org/10.1007/s11031-018-9735-x>
- Muthén, L. K., & Muthén, B. O. (1998). Mplus: Statistical analysis with latent variables. *Mplus user's Guide* (6th ed.). Los Angeles, CA: Muthén & Muthén.
- Olson-Buchanan, J. B., & Boswell, W. R. (2006). Blurring boundaries: Correlates of integration and segmentation between work and non-work. *Journal of Vocational Behavior*, 68, 432–445. <https://doi.org/10.1016/j.jvb.2005.10.006>
- Reis, H. T. (2008). Reinvigorating the concept of situation in social psychology. *Personality and Social Psychology Review: An Official Journal of the Society for Personality and Social Psychology, Inc*, 12, 311–329. <https://doi.org/10.1177/1088868308321721>
- Rimal, R. N., & Lapinski, M. K. (2015). A re-explication of social norms, ten years later. *Communication Theory*, 25, 393–409. <https://doi.org/10.1111/comt.12080>
- Schnauber-Stockmann, A., Bayer, J. B., Harari, G. M., & Karnowski, V. (2024). The situation in media and communication research. *Communication Theory*, 35, 25–36. <https://doi.org/10.1093/ct/qtae021>
- Semin, G. R., & Smith, E. R. (2013). Socially situated cognition in perspective. *Social Cognition*, 31, 125–146. <https://doi.org/10.1521/soco.2013.31.2.125>
- Short, J., Williams, E., & Christie, B. (1976). *The social psychology of telecommunications*. London: John Wiley & Sons
- Stone, A. A., & Shiffman, S. (2002). Capturing momentary, self-report data: A proposal for reporting guidelines. *Annals of Behavioral Medicine*, 24, 236–243. https://doi.org/10.1207/S1532479ABM2403_09
- Taylor, S. H., & Bazarova, N. N. (2021). Always available, always attached: A relational perspective on the effects of mobile phones and social media on subjective well-being. *Journal of Computer-Mediated Communication*, 26, 187–206. <https://doi.org/10.1093/jcmc/zmab004>
- Thulin, E., Vilhelmson, B., & Schwanen, T. (2020). Absent friends? Smartphones, mediated presence, and the recoupling of online social contact in everyday life. *Annals of the Association of American Geographers. Association of American Geographers*, 110, 166–183. <https://doi.org/10.1080/24694452.2019.1629868>
- Trepte, S., Masur, P. K., & Scharnow, M. (2018). "Mutual friends' social support and self-disclosure in face-to-face and instant messenger communication": Communication. *The Journal of Social Psychology*, 160, 265. <https://psycnet.apa.org/fulltext/2020-10224-025.pdf>
- Valkenburg, P. M., & Peter, J. (2009). The effects of instant messaging on the quality of adolescents' existing friendships: A longitudinal study. *Journal of Communication*, 59, 79–97. <https://doi.org/10.1111/j.1460-2466.2008.01405.x>
- Vanden Abeele, M. M. P., De Wolf, R., & Ling, R. (2018). Mobile media and social space: How anytime, anyplace connectivity structures everyday life. *Media and Communication*, 6, 5–14. <https://doi.org/10.17645/mac.v6i2.1399>
- Walther, J. B. (1992). Interpersonal effects in computer-mediated interaction: A relational perspective. *Communication Research*, 19, 52–90. <https://doi.org/10.1177/009365092019001003>
- Walther, J. B. (2011). Theories of computer-mediated communication and interpersonal relations. In M. L. Knapp & J. A. Daly (Eds.), *The SAGE handbook of interpersonal communication* (4th ed., pp. 443–479). SAGE.
- Walther, J. B., & Parks, M. R. (2002). Cues filtered out, cues filtered in: Computer-mediated communication and relationships. In M. L. Knapp & J. A. Daly (Eds.), *Handbook of interpersonal communication* (3rd ed., pp. 529–563). Sage
- Walther, J. B., Van Der Heide, B., Ramirez, A., Jr., Burgoon, J. K., & Peña, J. (2015). Interpersonal and hyperpersonal dimensions of computer-mediated communication. In S. S. Sundar (Ed.), *The handbook of the psychology of communication technology* (pp. 3–22). Wiley Blackwell. <https://doi.org/10.1002/9781118426456.ch1>
- Yang, C. C., Brown, B. B., & Braun, M. T. (2014). From Facebook to cell calls: Layers of electronic intimacy in college students' interpersonal relationships. *New Media & Society*, 16, 5–23. <https://doi.org/10.1177/1461444812472486>