

The situation is calling: Examining personality-situation fit in computer-mediated social interactions

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1) Data collection. Have any data been collected for this study already?

The data used for the current project have already been collected. We have explored descriptive statistics among the variables collected as part of the project, but the variables have never been used in the analytic models specified in this preregistration.

2) Hypothesis. What's the main question being asked or hypothesis being tested in this study?

This study aims to examine how technology-mediated social interactions are related to momentary well-being states and which variables moderate this relationship. We compare three different modes of communication: face-to-face interactions (FTF), computer-mediated communication (CMC), and mixed interactions (FTF + CMC). In addition, we will examine how different CMC modes (i.e., talking on the phone/video-chatting vs. texting/chatting/emailing vs. interactions on social networking sites) are related to momentary well-being. In an effort to resolve some of the inconsistencies observed in the previous literature, we will investigate if personality traits and situational cues (i.e., the interaction partner) moderate the associations. The following predictions are made:

Analysis 1:

Hypothesis 1: All modes of communication (i.e., FtF interactions, CMC, and mixed interactions) will be associated with higher momentary well-being, compared to not interacting with anyone.

Hypothesis 2: The relationship between different modes of communication and momentary well-being will be moderated by extraversion, agreeableness, and neuroticism.

We will test two competing hypotheses (see Van Zalk, Branje, Denissen, Van Aken, & Meeus, 2011; Ruppel, Burke, Cherney, & Dinsmore, 2018). According to the rich-get-richer hypothesis, individuals with high quality social relationships (i.e., those high in extraversion and agreeableness and low in neuroticism) will benefit more from all modes of communication, as these individuals have better interpersonal skills and generally enjoy social interactions more. By contrast, according to the social compensation hypothesis, individuals who experience problems with their social relationships (i.e., those low in extraversion and agreeableness and high in neuroticism) will benefit more from CMC, because they can use CMC to compensate for a lack of social interactions in other contexts.

Analysis 2:

Hypothesis 3: CMC and mixed interactions will be associated with lower momentary well-being, compared to FtF interactions.

Hypothesis 4: Social interactions with family members and others will be associated with lower momentary well-being, compared to social interactions with peers.

Hypothesis 5: The relationship between the interaction partner and momentary well-being will be moderated by neuroticism, such that individuals with higher levels of neuroticism will benefit more from interactions with peers, compared to individuals low in neuroticism.

Analysis 3:

Hypothesis 6: Texting/chatting/emailing and interactions on social networking sites will be associated with lower momentary well-being, compared to talking on the phone/video-chatting.

3) Dependent variable. Describe the key dependent variable(s) specifying how they will be measured.

Dependent Variable

The dependent variables will be the *momentary well-being* states. Specifically, every time participants complemented an ESM survey, they responded to the following three questions: “RIGHT NOW, I am feeling CONTENT/STRESSED/LONELY” on a 4-point scale (1 = Not at all, 2 = A little bit, 3 = Quite a bit, 4 = Very much). In order to increase reliability, we will recode the reverse items and compute an average mean as an overall index for momentary well-being.

Other variables

The independent variables will be (1) the *mode of communication*, (2) the *interaction partner*, and (3) Big Five *personality traits*.

With respect to the *mode of communication*, participants completed the following question:

During the past FIFTEEN MINUTES, I spent time interacting with others by: (check all that apply)

Talking in person

Talking on the phone

Text messaging on the phone

Chatting on Whatsapp or other chat app

Chatting on a dating app

Emailing

Video-chatting

Interacting on Facebook

Interacting on Instagram
Interacting on Snapchat
Interacting on Twitter
Other form of interaction
Not applicable, was not interacting with anyone
SKIP QUESTION

To test the first and second set of hypotheses, the response options will be collapsed into the following four categories: (1) no social interaction (“Not applicable, was not interacting with anyone”), (2) FtF-only (“Talking in person”), (3) CMC-only (any combination of the following response options: “Talking on the phone”, “Text messaging on the phone”, “Chatting on Whatsapp or other chat app”, “Chatting on a dating app”, “Emailing”, “Video-chatting”, “Interacting on Facebook”, “Interacting on Instagram”, “Interacting on Snapchat”, “Interacting on Twitter”), and (4) mixed (both “Talking in person” and any of the response options listed in category 3).

To test the third set of hypotheses, the category CMC-only will be divided into the following sub-categories: (1) talking on the phone/video-chatting (TVC-only; “Talking on the phone” and/or “Video-chatting”), (2) texting/chatting/emailing (TCE-only; “Text messaging on the phone”, “Chatting on Whatsapp or other chat app”, “Chatting on a dating app”, and/or “Emailing”), and (3) interactions on social networking sites (SNS-only; “Interacting on Facebook”, “Interacting on Instagram”, “Interacting on Snapchat”, and/or “Interacting on Twitter”).

The *interaction partner* was reported as follows:

I was interacting with the following people: (check all that apply)

Classmates, students
Co-workers
Family
Friends
Roommates
Significant Other
Strangers
None of the above, Other
SKIP QUESTION

The response options will be collapsed into the following three categories: (1) family (“Family”), (2) peers (“Friends”, “Roommates”, and/or “Significant Other”), and (3) others (“Classmates, students”, “Co-workers”, and/or “Strangers”).

Personality traits were measured using the Big Five Inventory (BFI; John & Srivastava, 1999). The BFI consists of 44 items, which can be averaged to calculate scores for the Big

Five personality traits: extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience.

Control variables

We will include the following control variables from the demographic survey:

- *Sex*: “What is your gender? 0 = Male, 1 = Female”
- *Ethnicity*: “Which ethnic group(s) do you consider yourself? 1 = African American/Black, 2 = Asian/Asian American, 3 = Hispanic/Latino, 4 = Anglo/White, 5 = Native American, 6 = Pacific Islander, 7 = other”
 - Participants had the opportunity to identify with multiple ethnic labels. Therefore, we will create one dummy variable: 0 = Anglo/White only, 1 = Non-Anglo/White, multi-ethnic.
- *Socio-economic status (SES)*: “What is the highest level of education your MOTHER/FATHER attained? 1 = less than 6 years, 2 = less than 12 years, 3 = high school graduate, 4 = some college, 5 = college graduate, 6 = masters level degree, 7 = doctoral degree”
 - The following dummy variable will be created: 0 = at least one parent completed some college, 1 = less than some college.

Moreover, we will include the day of the week (i.e., 0 = weekday vs. 1 = *weekend* day) as a control variable.

4) Conditions. How many and which conditions will participants be assigned to?

Participants were not assigned to any conditions.

5) Analyses. Specify exactly which analyses you will conduct to examine the main question/hypothesis.

Due to the nested structure of the data (measurement occasions nested within participants) multilevel models will be estimated. We will run three sets of analyses.

Analysis 1: Predicting Momentary Well-Being from Mode of Communication (No Social Interaction vs. FtF-only vs. CMC-only vs. Mixed) and Personality Traits

Our first set of analyses will focus on the relationship between different modes of communication and momentary well-being, compared to not interacting with anyone (reference category). Our models will be estimated as follows:

Step 1: We will estimate the main effects of *mode of communication* (represented by three dummy variables, measured at Level 1, reference category: no social interaction) and *personality traits* (measured at Level 2, centered at the sample mean, each trait in separate models) on *momentary well-being*. At Level 1, we will control for the effect of day (*weekend*

day vs. week day). At Level 2, we will control for *sex*, *ethnicity*, and *SES*. All effects measured at Level 1 will be allowed to vary randomly between participants.

The main effects of *mode of communication* indicate if this mode of communication (i.e., FtF-only, CMC-only, or mixed) is associated with higher or lower well-being, compared to not interacting with anyone (see Hypothesis 1). The main effects of *personality traits* indicate if participants scoring high on this trait experience higher or lower well-being in general.

Step 2: We will add the cross-level interactions between *mode of communication* and *personality traits* to determine if the effects of the different modes of communication vary as a function of personality traits (see Hypothesis 2).

Analysis 2: Predicting Momentary Well-Being from Mode of Communication (FtF-only vs. CMC-only vs. Mixed), Interaction Partner (Peers vs. Family vs. Others), and Personality Traits

In the second set of analyses, we will examine the effects of computer-mediated and mixed interactions on momentary well-being, compared to face-to-face interactions. Our models will be estimated as follows:

Step 1: We will estimate the main effects of (1) *mode of communication* (represented by two dummy variables, measured at Level 1, reference category: FtF-only), (2) *interaction partner* (represented by two dummy variables, measured at Level 1, reference category: peers), and (3) *personality traits* (measured at Level 2, centered at the sample mean, each trait in separate models) on *momentary well-being*. At Level 1, we will control for the effect of day (*weekend day vs. week day*). At Level 2, we will control for *sex*, *ethnicity*, and *SES*. All effects measured at Level 1 will be allowed to vary randomly between participants.

The main effects represent: (1) the effects of CMC-only and mixed interactions compared to FtF-only interactions (see Hypothesis 3), (2) the effects of interactions with family members and others compared to interactions with peers (see Hypothesis 4), and (3) the effects of personality traits on momentary well-being following social interactions.

Step 2: We will add all two-way interactions. Specifically, at Level 1, we will include the within-person interactions between *mode of communication* and *interaction partner*. The within-person interactions indicate whether the effects of different modes of communication vary as a function of the interaction partner. In addition, we will add the cross-level interactions between *mode of communication* and *personality traits* and between *interaction partner* and *personality traits*. The cross-level interaction effects indicate if the effects of mode of communication and interaction partner differ as a function of personality (see Hypotheses 2 and 5).

Step 3: Lastly, we will add all three-way interactions.

The final regression equation at the within-person level has the following form:

$$\begin{aligned}
y_{it} = & \beta_{0i} + \beta_{1i}(CMC_{ti}) + \beta_{2i}(Mixed_{ti}) + \beta_{3i}(Family_{ti}) + \beta_{4i}(Others_{ti}) \\
& + \beta_{5i}(CMC_{ti} \times Family_{ti}) + \beta_{6i}(CMC_{ti} \times Others_{ti}) \\
& + \beta_{7i}(Mixed_{ti} \times Family_{ti}) + \beta_{8i}(Mixed_{ti} \times Others_{ti}) + \beta_{9i}(Weekend_{ti}) + \varepsilon_{ti}
\end{aligned} \tag{1}$$

where y_{it} represents the momentary well-being state for person i at time t , which is modelled as a function of the person-specific intercept β_{0i} indicating average momentary well-being in face-to-face social interactions with peers on weekdays (reference category), the person-specific effects of *mode of communication* β_{1i} (CMC-only) and β_{2i} (mixed), the person-specific effects of *interaction partner* β_{3i} (family) and β_{4i} (others), the interactions between *mode of communication* and *interaction partner* ($\beta_{5i} - \beta_{8i}$), the effect of *weekend* β_{9i} , and a residual error ε_{ti} . The error term is assumed to be normally distributed.

At the between-person level, the effects are further specified as follows:

$$\beta_{0i} = \gamma_{00} + \gamma_{01}(Personality_i) + \gamma_{02}(Sex_i) + \gamma_{03}(Ethnicity_i) + \gamma_{04}(SES_i) + \mu_{0i}, \tag{2}$$

$$\beta_{1i} = \gamma_{10} + \gamma_{11}(Personality_i) + \mu_{1i}, \tag{3}$$

$$\beta_{2i} = \gamma_{20} + \gamma_{21}(Personality_i) + \mu_{2i}, \tag{4}$$

$$\beta_{3i} = \gamma_{30} + \gamma_{31}(Personality_i) + \mu_{3i}, \tag{5}$$

$$\beta_{4i} = \gamma_{40} + \gamma_{41}(Personality_i) + \mu_{4i}, \tag{6}$$

$$\beta_{5i} = \gamma_{50} + \gamma_{51}(Personality_i) + \mu_{5i}, \tag{7}$$

$$\beta_{6i} = \gamma_{60} + \gamma_{61}(Personality_i) + \mu_{6i}, \tag{8}$$

$$\beta_{7i} = \gamma_{70} + \gamma_{71}(Personality_i) + \mu_{7i}, \tag{9}$$

$$\beta_{8i} = \gamma_{80} + \gamma_{81}(Personality_i) + \mu_{8i}, \tag{10}$$

where γ_{00} indicates the level of momentary well-being for the typical individual after face-to-face interactions with peers on weekdays and γ_{01} to γ_{04} reflect the extent to which the typical individual's momentary well-being after face-to-face interactions with peers is related to personality traits and demographic variables.

The parameters γ_{11} and γ_{21} represent the cross-level interactions between *mode of communication* and *personality traits*. The parameters γ_{31} and γ_{41} represent the cross-level interactions between *interaction partner* and *personality traits*. The parameters γ_{51} to γ_{81} represent the three-way interactions between *mode of communication*, *interaction partner*, and *personality traits*. The μ s represent the random effects, which are assumed to be multivariate normally distributed and may be correlated. In our final models, we will remove all nonsignificant higher-order interactions to provide the most parsimonious description of the data.

Analysis 3: Predicting Momentary Well-Being from CMC mode (TVC-only vs. TCE-only vs. SNS-only), Interaction Partner (Peers vs. Family vs. Others), and Personality Traits

We will run the same analyses as described above. However, we will focus on CMC-only interactions and estimate the effects of TCE and SNS on momentary well-being, compared to

talking on the phone/video-chatting (reference category). The main effects of CMC mode indicate if using this mode of communication is related to higher or lower momentary well-being, compared to talking on the phone/video-chatting (see Hypothesis 6). Again, we will include the *interaction partner* and *personality traits* as moderator variables in a step-wise process (see Analysis 2).

We will report exact *p*-values, but only interpret *p*-values below .01, given the number of significance tests.

6) Outliers and Exclusions. Describe exactly how outliers will be defined and handled, and your precise rule(s) for excluding observations.

We will exclude

1. partial reports
2. reports that were completed too close to each other (whenever participants completed two surveys within 15 minutes, we will remove all surveys after the first that fell within the subsequent three hours, based on the timing of the notifications being ~3 hours apart)
3. participants younger than 18 or older than 24.

Furthermore, based on our research questions, we will analyze sub-samples to address the specified hypotheses. The selection of the sub-samples is as follows:

Models 1:

We will exclude

1. all measurement occasions when participants chose “Other form of interaction” or “SKIP QUESTION” when indicating the *mode of communication*, and
2. all measurement occasions when participants chose “Not applicable, was not interacting with anyone” in combination with another response option due to the ambiguity of this response.

Model 2:

Based on the data set that was selected for Analysis 1, we will additionally exclude

1. all measurement occasions when participants were not interacting with anyone,
2. all measurement occasions when participants chose “None of the above, Other” or “SKIP QUESTION” when indicating the *interaction partner*, and
3. all measurement occasions when participants chose interaction partners from multiple categories (e.g., peers and family).

Model 3:

Based on the data set that was selected for Analysis 2, we will additionally exclude

1. all measurement occasions when participants were solely interacting FtF or when they used both FtF and CMC (mixed interactions), and

2. all measurement occasions when participants chose CMC modes from multiple categories (e.g., TCE and SNS).

7) Sample Size. How many observations will be collected or what will determine sample size? No need to justify decision, but be precise about exactly how the number will be determined.

The data were collected as part of a Writing Assignment in an introductory Psychology class. As such, the sample size was limited by the number of students enrolled in the class ($N = 1400$).

8) Other. Anything else you would like to pre-register? (e.g., secondary analyses, variables collected for exploratory purposes, unusual analyses planned?)

Note that when indicating the *mode of communication* and *interaction partner*, participants could choose multiple response options (i.e., participants could choose multiple interaction partners and multiple CMC modes at one measurement occasion). To account for this unique feature of the data, we will include mixed categories (e.g., peers and family, TCE and SNS) in additional exploratory analyses. However, as we do not have any hypotheses regarding interactions with multiple interaction partners or interactions using specific combinations of CMC modes, the mixed categories will not be included in the main analyses.

If the models fail to converge due to the large number of random effects, we will sequentially drop random effects. First, we will exclude the random effects of two-way interactions. Second, we will exclude the random effects of dummy-coded variables.

Finally. For record keeping purposes, please tell us the type of study you are pre-registering.

Survey/Observational study

References

- John, O. P., & Srivastava, S. (1999). The Big Five trait taxonomy: History, measurement, and theoretical perspectives. In L. A. Pervin & O. P. John (Eds.), *Handbook of personality: Theory and research* (pp. 102–138). New York, NY: Guilford Press.
- Ruppel, E. K., Burke, T. J., Cherney, M. R., & Dinsmore, D. R. (2018). Social Compensation and Enhancement via Mediated Communication in the Transition to College. *Human Communication Research*, 44(1), 58–79. <https://doi.org/10.1093/hcr/hqx003>
- Van Zalk, M. H. W., Branje, S. J. T., Denissen, J., Van Aken, M. A. G., & Meeus, W. H. J. (2011). Who Benefits From Chatting, and Why?: The Roles of Extraversion and Supportiveness in Online Chatting and Emotional Adjustment. *Personality and Social Psychology Bulletin*, 37(9), 1202–1215. <https://doi.org/10.1177/0146167211409053>