Exploring the Relationship between Social Contact and Well-Being among University Students: An Experience Sampling Study

Julian A. Jung

Department of Behavioral Management and Social Sciences, University of Twente

Positive Psychology and Technology

1st Supervisor: Dr. Lonneke Lenferink

2nd Supervisor: Dr. Matthijs Noordzij

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Abstract

Background. University students face increasing psychological problems. High well-being evidently supports coping with psychological problems and is positively related to social contact. The relationship of well-being and social contact in students rarely has been studied with data derived from daily life experience, which could inspire new interventions for enhancing students' mental health.

Method. An experience sampling method study was conducted for 14 consecutive days among 32 university students. Social contact was measured three times a day by examining the daily frequency (scale from 0 = no contact to 3 = contact throughout the whole day), relationship type (partner, close friend(s), family members, acquaintances versus no contact as reference category) and setting (at home in person, outside home in person, online versus no contact). Well-being was assessed with the Short Warwick-Edinburgh Mental Well-Being Scale.

Results. Linear mixed models revealed weak, positive associations of well-being and social contact frequency on a between-person ($\beta = .29$, $p \leq .001$) and within-person ($\beta = .22$, $p \leq .001$) level. All examined relationship types and social settings possessed positive associations with well-being.

Conclusion. The close relationship between well-being and social contact was observed also in daily life. All relationship types and settings come with significantly higher well-being than no contact, without a particular type or setting relating to well-being more than another. While contact frequency generally relates positively to well-being, the strength and direction of this association can differ greatly between individuals. Findings encourage the creation of tailored social contact opportunities in the university environment.

Exploring the Relationship between Social Contact and Well-Being among University Students: An Experience Sampling Study

Extraordinarily demanding circumstances and mental burdens make university students a high-risk population for mental health issues (Macaskill, 2013; Stallman, 2010; Storrie, Ahern, & Tuckett, 2010). Mental health issues in a population that is so critical for a prospering society call for an exploration of ways to intervene in this alarming trend. Research suggests that one way to decrease mental illness is by increasing well-being. By strengthening resilience, well-being can act as a buffer and leverage point in the process of dealing with psychological adversities. Literature implies that social contact is one factor that is positively associated with well-being. So far this association rarely has been studied on the ground of daily-life experience, which could contribute to the process of gaining a reality-based understanding of this relationship by being sensitive to momentary changes in the environment of an individual (Myin-Germeys et al., 2009). Therefore, an investigation of the association between social contact and well-being in the context of daily life could provide valuable information on ways to effectively facilitate mental health in individuals.

Well-Being

Traditionally, psychology built its understanding of mental health primarily on the absence or presence of mental illness (Seligman & Csikszentmihalyi, 2014; Sheldon & King, 2001). However, according to the two continua model by Keyes (2005), a complete understanding of mental health also takes into account a positive mental health continuum, namely well-being, in addition to mental illness. The two continua model suggests that mental illness and well-being are related, but still have to be regarded as two distinct constructs (Westerhof & Keyes, 2009). Reaching back to ancient philosophical ideas of hedonism and eudaimonia, well-being can broadly be described by a combination of positive emotion and positive functioning. Various conceptualizations of well-being have been developed which resolve around and specify one or both of the just mentioned emotional and functional

components of well-being (Tov, 2018). However, since well-being is a very broad construct, psychological research has not yet agreed on one, unmitigated definition.

Research has demonstrated the significant advantages high levels of well-being have for mental health. First, high levels of well-being significantly reduce the risk of mental disorders including mood and anxiety disorders (Lamers, Westerhof, Glas, & Bohlmeijer, 2015; Schotanus-Dijkstra, ten Have, Lamers, de Graaf, & Bohlmeijer, 2016). Second, high levels of well-being increase the chances of recovery from psychological disorders, such as anxiety and bipolar disorder (Kraiss et al., 2019; Schotanus-Dijkstra, Keyes, de Graaf, & ten Have, 2019). Third, the increased resilience resulting from positive mental health reduces the risk of suicide ideation and attempts (Brailovskaia et al., 2019; Brailovskaia, Teismann, & Margraf, 2018; Teismann, Brailovskaia, & Margraf, 2019).

All these findings considered, positive mental health not only is a pleasant experience in itself but moreover, acts as a key catalysator in the prevention and treatment of mental illness. Consequently, for people who face a distressing life amidst mental health-related difficulties, sufficient well-being can act as a buffer and leverage point to holistically prevent and counteract these adversities.

Well-Being in Students

Research has shown that levels of mental illness and well-being are next to genetic factors, greatly influenced by external life circumstances (Kendler, Myers & Keyes, 2011; Levett, 2010). One population with especially demanding life circumstances is university students. Many students are financially dependent and unstable while they have to adapt to new circumstances and environments, next to handling continuous academic pressure at a young age (Macaskill, 2013). An increasingly depersonalized university environment, resulting from growing student numbers, further complicates healthy coping with rapidly increasing academic demands (Denovan & Macaskill, 2017).

Consequently, many studies reveal higher prevalence rates of psychological distress in university students than in the general population (Adlaf, Gliksman, Demers & Newton-Taylor, 2001; Fried, Papanikolaou, Epskamp, 2021; Stallman, 2010). Investigations in university student populations found that about half of the students reported at least one mental health concern or psychiatric disorder (Blanco et al., 2008; Storrie et al., 2010; van Rooij, Fokkens-Bruinsma, Jansen, & van der Meer, 2018). Common psychopathologies in students include depression, anxiety, eating disorder, obsessive-compulsive disorder, and self-harm (Storrie et al., 2010). Additionally, healthy coping is especially difficult in this population due to large numbers of university students refraining from psychological treatment, one central reason for this being stigma among university students (Blanco et al., 2008; Macaskill, 2013; Storrie, et al., 2010)

On the positive mental health side, moderate to high well-being levels have been found in large proportions of university students all over the world. In a Canadian study, for instance, only nine percent of the students reported low well-being levels (Peter, Roberts, & Dengate, 2011). Nevertheless, students' well-being levels were lower than general population estimates (Cardwell et al., 2013). This prompts a large potential in promoting the positive mental health of students, in order to diminish the high number of cases dealing with mental health-related issues.

The Importance of Social Contact for Well-Being

Well-being levels have been found to be related to the context in which they are measured (Schwanen & Wang, 2014). One contextual factor that seems to play a central role in well-being is positive social contact (Keyes, 1998; Keyes, 2002; Ryff, 1989). Studies have demonstrated that positive social contact is crucial for the experience of high well-being (Algoe, 2019; Diener & Seligman, 2002; Fink, 2014; Schotanus-Dijkstra et al., 2015), and also that a lack of it can lead to severely impaired well-being (Baumeister & Leary, 1995; Cacioppo & Cacioppo, 2014; Rook, 1984). While extensive evidence supports that the quality of social

contact, including the experience of shared positive affect (Algoe, 2019), feeling understood (Reis, Lemay Jr. & Finkenauer, 2017) or mutual support (Noble & McGrath, 2012) is associated with well-being, less research has been conducted about the relationship of social contact frequency and well-being.

Exploring how social contact quality and frequency relate to well-being could be improved by means of collecting data based on daily life experiences. So far, most studies on well-being have analyzed the construct from a between-person perspective, which examines the differences between individuals or groups, thus neglecting potential variability within an individual (e.g. Aghababaei, Błachnio & Aminikhoo, 2018; Costa, Steffgen & Ferring, 2017; Warr, 1978). However, intraindividual variance can be two to four times larger than the variance between groups (Fisher, Medaglia & Jeronimus, 2018), which implies that aggregated, between-subject data do not always reflect the experience within individuals accurately (Curran & Bauer, 2011). Additionally, findings based on real-life experiences possess high ecological validity (Hektner & Csikszentmihalyi, 2002, p. 234ff.; Scollon, Kim-Pietro & Diener, 2009) and therefore can effectively contribute to the development of real-life interventions (Warr, 1978).

To collect everyday-life data and utilize its advantages, the Experience Sampling Method (ESM) can be applied. ESM makes use of short, self-report measurements on several occasions during the everyday life of participants. This allows capturing naturally occurring variations in well-being levels and the corresponding social circumstances. Moreover, ESM's *in situ* measurement style makes it much easier for participants to recall and report their cognitive and affective state when self-reporting, thereby decreasing memory bias (Hektner & Csikszentmihalyi, 2002, p. 234; Scollon et al., 2009).

Hence, the current research aims at taking a new, everyday-life perspective on the well-researched relationship between social contact and well-being. In the current study, the relationship of social contact and well-being is analyzed on the basis of social contact frequency

on a between- and within-person level (ranging from 0, indicating no social contact, to 3, indicating social contact on all three measurement occasions of one day), relationship type of social contact (i.e., partner, close friends, family members, acquaintances) and setting of social contact (i.e., online, indoors in-person, outdoors in-person). How all these conditions relate to well-being is compared to the experience of well-being when no social contact occurs. This study pursues the target to take a more precise look at the relationship between well-being and social contact in the daily life of university students. By being sensitive to the constant variations that occur in daily life, a reality-based impression of this relationship is created, which can be used to advance the tailoring and timing of interventions aiming at tackling students' increasing mental health issues.

Research Questions and Hypotheses

The present study aims to explore how social contact is associated with well-being in the daily life of participants, thereby addressing the following research questions: (RQ1) What is the relationship between daily well-being and the daily social contact frequency on a within- and a between-subject level in university students' daily life? It is hypothesized that *(h1) A higher frequency of social contact is associated with higher levels of well-being on a between- and within-person level.* (RQ2) What is the association between the type of relationship in which social contact occurs and the average state well-being in university students' daily life? It is hypothesized that *(h2) Social contact with the partner, family, close friends, and acquaintances has a positive association with well-being, while no social contact shows a negative association with well-being.* (RQ3) What is the association between the setting in which social contact takes place and the average state well-being in university students' daily life? It is hypothesized that *(h3) Real-life social contact is associated with higher levels of well-being than online-social contact and no social contact.*

Method

The study is part of a larger project examining several topics related to psychopathology and well-being in daily life in Bachelor students of the University of Twente. This study was approved by the ethics committee of the University of Twente. All participants took part voluntarily and gave informed consent before participation.

Participants

Participants were sampled through non-probability convenience sampling which chooses participants based on easy accessibility to the researcher, timely availability, and willingness to participate (Etikan, Musa & Alkassim, 2016). Sampling on the basis of these criteria served the research method since ESM studies require frequent participation and thus demand high levels of commitment from participants (Yearick, 2017). Further, a sufficient understanding of the English language and access to a mobile device with the possibility to download the Ethica App were necessary criteria for inclusion. In total, 34 participants signed up for the study of which some participants (n = 2) were excluded because they possessed a state assessment completion rate of under 50 percent. The final sample, therefore, comprised 32 students with different nationalities from the University of Twente in the Netherlands.

Design and Procedure

In line with prior research (Van Berkel, Ferreira & Kostakos, 2018), the data collection had a duration of two weeks and took place between *April 06, 2020 – April 19, 2020.* Participants were requested to indicate their current well-being as well as current or just experienced social contacts in the smartphone application Ethica (https://ethicadata.com/product), which can be downloaded on Android and iOS devices. The items of the study, as well as informed consent, were uploaded to the Ethica app. Participants were digitally invited to take part in the study. The resulting digital research environment features easy accessibility and usability for participants, real-time data collection, as well as user-privacy protection (Ethica, 2020).

Interval-contingent sampling was used for the current study. On three fixed moments per day, participants have been presented the same set of questions. The appropriateness of three measurement points for this study's purpose is scientifically supported. Measurements should happen frequently enough to capture important variations in experience while each additional burden for participants in form of more frequent measuring has to be justified by an obvious gain in relevant information (Christensen, Barrett, Bliss-Moreau, Lebo & Kaschub, 2003). On the first day of the study, participants additionally had to indicate demographic information. The daily measurement points followed a fixed schedule determined by the researchers. Measurement points initiated an interval of three to four hours in which an answering in the Ethica app was possible. This is to ensure a high likelihood of participants' availability for answering, while still being close to their current state and circumstances of interest. Retroactive responding, outside of the provided timeframe, was not possible. Measurements were scheduled in the morning at 10 am until 1 pm, in the afternoon at 3 pm until 6 pm, and in the evening at 8 pm until 12 am. Researchers expected that the time needed for a thorough answering of the questions provided in the Ethica app should not exceed three minutes. To increase compliance, participants received a reminding notification on their smartphones at the beginning of a measurement interval. A second reminder was sent 90 minutes after the beginning of a measurement interval. The positive effect of reminders on smartphone app adherence rates has been validated (Seitzinger, Osgood, Martin, Tataryn & Waldner, 2019; Van Berkel et al., 2018).

Materials and Measures

In the overarching project in which the current study is embedded, a baseline questionnaire which comprised five demographic questions (Appendix A), Short Warwick-Edinburgh Mental Well-Being Scale (SWEMWBS), Hospital Anxiety and Depression Scale (HADS), Perceived Stress Scale (PSS) and the General Self-Efficacy Scale were administered on the first study day. On the remaining days, the momentary questionnaire included a Visual

Analogue Scale for each anxiety and depression, the Short Warwick-Edinburgh Mental Well-Being Scale (SWEMWBS) adjusted for experiences in the last two hours, two items on recent social contact, and four items about recent, potentially stressful events. For the current study, only the baseline and momentary well-being measures (SWEMWBS), as well as the social contact measures are of interest and will be described in more detail hereafter.

Short Warwick-Edinburgh Mental Well-Being Scale

Momentary well-being was assessed using sum scores (possible range: 5-35) of the Short Warwick-Edinburgh Mental Well-Being Scale (Appendix B). The unidimensional SWEMWBS consists of seven positively worded statements e.g. "*I've been feeling optimistic about the future*" to which the respondent has to relate on a five-point Likert scale ranging from (1) *'none of the time'* to (5) '*all of the time'*. The SWEMWBS possesses a high correlation to the original, 14-item version (WEMWBS) with a spearman correlation of ρ= .954 (Stewart-Brown et al., 2009), next to possessing a high internal consistency and reliability (Cronbach's alpha =.89) (Vaingankar et al., 2017), as well as acceptable construct, criterion-related, and discriminant validity (Haver, Akerjordet, Caputi, Furunes & Magee, 2015). Despite its brevity, the SWEMWBS provides a complete picture of respondents' well-being, because it assesses both the hedonic (emotional) and the eudemonic (psychological) aspect of well-being. (Haver et al., 2015; Stewart-Brown et al., 2009). For clinical interpretation, the Warwick Medical School provided clinically correlated cutoffs at > 28 for high well-being, 21-27 for average well-being, 18-20 for possible depression, and < 17 for probable depression (Warwick Medical School, n.d.).

Social Contact Assessment

Characteristics of social contact were assessed by two single-items (Appendix C). The first item investigated the type of relationship in which recent social contact occurred by asking: "*Who did you spend time with within the last 2 hours?*". Participants could then choose from the following five answering options: (1) "*Partner*", (2) "*Close friend(s)*", (3)"*Family*

members", (4) "*Acquaintances (e.g., colleagues/fellow students)*" and (5) "*This does not apply, I was by myself*". It was only possible to choose one answering option. In case participants had contact with multiple people, they had to decide which social contact they considered as most important for reporting. This item was additionally used to determine the frequency of daily social contact, by differentiating participant answers between option five, indicating no social contact (0), and the four remaining answering options, which indicate that social contact took place (1). Because participants answered this item multiple times per day, a score representing the daily social contact frequency could be derived for each participant on each day. This score ranges from 0, indicating no social contact, to three, indicating social contact was experienced on all three daily measurement occasions and thus throughout the whole day. The follow-up item derived information on the setting in which this social contact took place by asking: " *How did this contact take place?*" The answering options to this question were: (1) "*Outside home, in-person*", (2) "*At home, in-person*", (3) "*Online (electronic devices)*" and (4) "*This does not apply, because I was by myself* ". Again, it was only possible to choose one answering option. In case participants had contact in multiple settings, they had to decide which social setting they considered as most important for reporting.

Data Analysis

The statistical program IBM SPSS Statistics (Version 24) was used to analyze the data. Descriptive statistics were utilized to analyze the demographics of the current sample, including gender, age, nationality, earned degree, and field of study.

To answer the research questions, a series of linear mixed model (LMM) analyses were conducted. LMM analyses are well suited for ESM studies since they take into account the nested structure of the data that results from multiple measurements per participant. This allows analyses on both the between- and within-subject level. The repeated covariance type in all LMM analyses was set to first-order autoregressive AR (1), which assumes that correlations

are higher for adjacent time points, resulting in correlations that decline exponentially with increasing distance between measuring points.

To prepare the data, sum scores of the SWEMWBS for each participant at each measurement point were calculated, which will be referred to as state well-being scores from now on. The state scores were then used to calculate a person mean (PM) as well as a person mean-centered (PMC) for each participant. The PM here represents the average well-being score per participant across all 42 measurement points. The PMC, represents the difference between the state well-being score and the PM, displaying intrapersonal variability and thus representing within-person variation. The state well-being score, the PM and the PMC, both on a measurement point level, were then standardized into z-scores. Afterward, an LMM was performed to calculate estimated marginal means (EM Means) of well-being scores for each participant over all measurement points. In this LMM, the state well-being score was set as the dependent variable and subject ID as the fixed factor.

In order to answer the first research question and analyze the association of daily well-being and the daily frequency of social contact on a within- and between-person level, further variables were prepared for LMM analysis. Therefore, as a first step, a dummy variable for the absence or presence of social contact at each measurement point per participant was created (0 = no social contact, 1 = social contact). Afterward, the sum of social contact occurrences per participant over all measurement points (possible range 0-42) was divided by the number of days to obtain a PM for social contact frequency on the level of days (possible range 0-3), which represents the average daily frequency for each participant. Next, the daily social contact frequency, meaning the sum of social contact occurrences per day (0-3) for each participant, was calculated. This score was subtracted from the PM for social contact frequency to obtain a PMC for social contact frequency. It was decided to calculate PM and PMC scores on the level of days because this allows a PM range of 0-3. Calculating these variables on the level of measurement points would only allow a PM range of 0-1. Relating this PM to the state

score would allow less variability and distinctiveness in PMC values. In the next step, the well-being scores were aggregated on a day level, resulting in a variable that indicates the mean of the three daily state well-being scores for each participant. A filter was used to ensure that aggregated well-being and social contact scores were only included once per day for each participant in the analyses. The mean daily well-being score, as well as the PM and PMC of daily social contact, were standardized into z-scores. To finally calculate estimates of the fixed effect of the daily social contact frequency on well-being, another LMM was applied. The LMM was then created with day as the repeated variable. The standardized mean daily well-being score of each participant was set as the dependent variable. As covariates, the standardized PM and PMC of daily social contact frequency per participant were selected. For the following analyses, the just created filter was turned off again.

To determine the association between the type of relationship in which social contact occurs and well-being on a between-person level, constituting the second research question, another LMM was utilized with the unstandardized state well-being score for each participant as the dependent variable. The categorical variable referring to the relationship type was included as the fixed factor and main effect. From this variable, the fifth answering option "*This does not apply, I was by myself.*" was decided to be an appropriate reference category.

A similar analysis procedure has been applied to answer the third research question, exploring the association between the setting in which social contact takes place and well-being on a between-person level. Again, an LMM with the unstandardized state well-being score as the dependent variable was set up. In this case, the categorical variable referring to the social contact setting was included as the fixed factor and main effect. From this variable, the fourth answering option "*This does not apply because I was by myself.*" was used as the reference category.

Results

Sample Characteristics and Descriptive Statistics

All sample members were students from the University of Twente with a mean age of 23.34 (*SD* = 2.79). Of the 29 participants who gave their demographic information, 17 (59%) were female. Except for three participants, the sample was of German nationality (90%). Most participants were studying social sciences (78%) at the time this study was conducted. A detailed representation of the sample demographics is provided in Appendix D, Table 1.

Mean Well-Being Levels across the Study Period

For the total sample (N = 32) the mean momentary well-being score was M = 25.56 (SD = 4.53) over the total study period. The majority of participants (n = 24/ 75%) scored between 21 and 27 on the well-being measurement, therefore possessing average well-being according to the norms provided by the Warwick Medical School (n.d.). Five participants (16%) obtained a well-being score above 28, which indicates high well-being. For three (9%) participants a well-being score below 21 was measured, signaling the possibility for depression. Figure 1 in Appendix D provides a graphic representation of the mean well-being scores for each participant.

The Relationship of Well-Being and Social Contact Frequency

Resulting from analyses corresponding to the first research question, significant associations between daily well-being levels and the daily frequency of social contact have been found on a within-and between-person level (Table 1).

Table 1

Estimates of Fixed Effects for Frequency of Social Contact on Well-Being (N=32)

						95% Confidence Interval	
	β	Std. Error	df	t	p	Lower Bound	Upper Bound
Intercept	-.11	.07	80.40	-.15	.88	-,15	.13
Within-Person Contact Frequency	.22	.04	331.42	5.92	< .001	.15	.30
Between-Person Contact Frequency	.29	.07	78.81	4.07	< .001	.15	.43

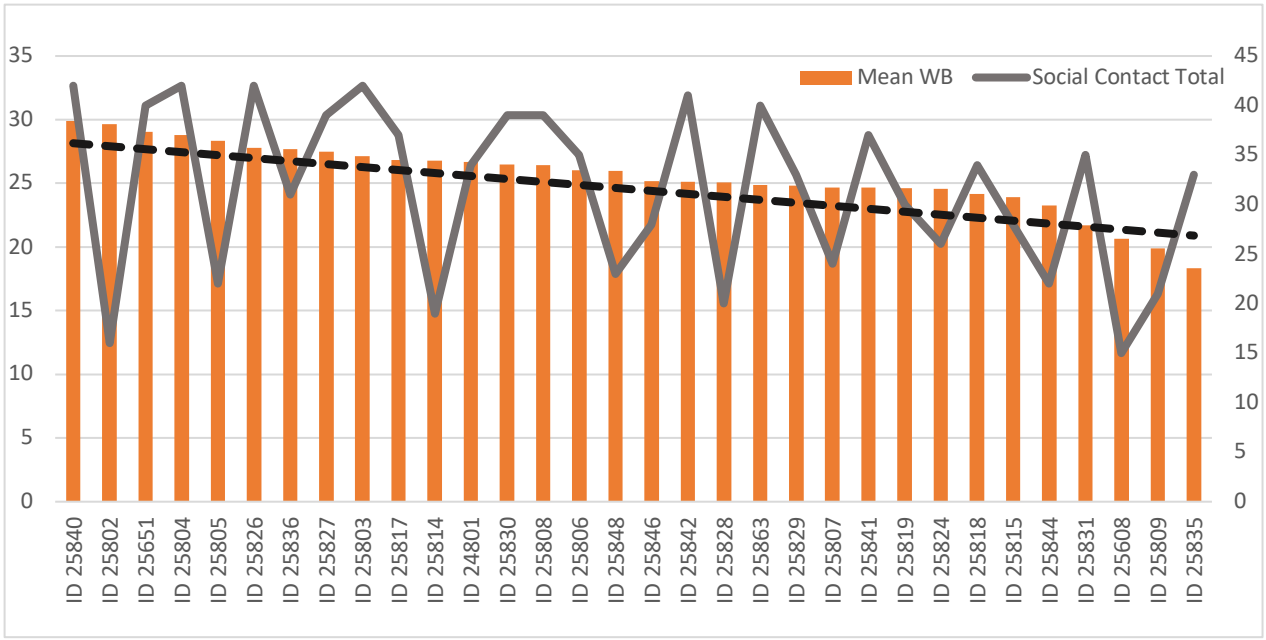
Visualization of Between-Person Association of Contact Frequency and Well-Being

From the 14 participants (e.g. ID: 25651, 25840) who reported at least 35 social contacts, which is slightly above the sample median (Median = 34), 10 (71%) had a mean well-being score above the sample mean (M = 25.56). As visible in Figure 1, all four participants who reached the maximum of 42 social contacts also possessed high well-being levels (> 27). The positive association is further embodied in some participants with low well-being levels who also experienced little social contact frequency (e.g. ID: 25608, 25809).

Looking at the extremes, however, reveals inconsistencies in the direction of the association between well-being levels and social contact frequency. The participant with the lowest well-being score (ID: 25835) reported a comparatively high frequency of 33, above sample average (M = 32.32), but still below the median frequency of 34. On the other extreme, the second-highest scoring participant (ID: 25802) in well-being indicated only 16 social contacts, representing the second-lowest measured frequency of social contact from all subjects.

Figure 1

Sum of Social Contact Occurrences and Mean Well-Being over all Measurement Points for Each Participant (N=32)



Note. Left y-axis refers to number of social contacts and right y-axis to mean SWEMWBS score
* Figure includes dotted regression line for social contact occurrences

Visualization of Within-Person Association of Contact Frequency and Well-Being

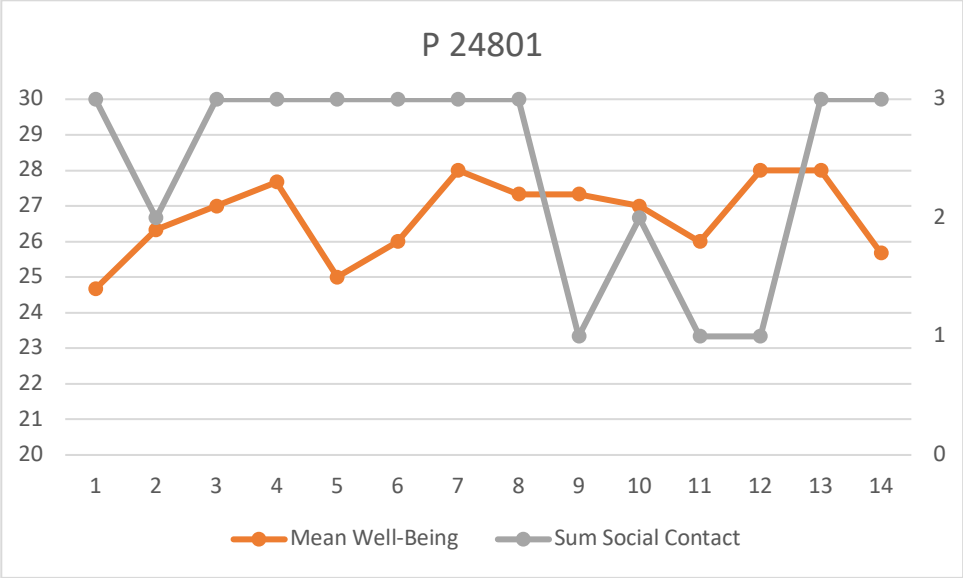
Intraindividual results suggest a positive relationship between the daily social contact frequency and the levels of daily well-being. During post-hoc analyses, participants were grouped into three fluctuation types, ordered from most to least common type: 1) inconsistent association type (n = 19), 2) positive association type (n = 9), 3) negative association type (n = 4). In the following, example participants' fluctuation patterns will be displayed for each of the three groups.

Participant 24801 (Figure 2) "Inconsistent Association Type". The majority of intraindividual results are characterized by inconsistent association patterns, meaning that fluctuations in well-being levels do not show a clear and consistent relationship with fluctuations in social contact frequency. For participant 24801 (Figure 2), social contact occurrences were experienced three times a day for the majority of the study period. Well-

being levels on these days include both this individual's minimum of 24.67 on day 1 and the maximum of 28 on day seven, twelve, and thirteen. However, the maximum of 28 was also reached when little social contact occurred like on day 12. On day 11, on which little social contact occurred as well with a value of 1, the fourth-lowest well-being score was measured for this participant. Nevertheless, the same well-being score of 26 was measured on a day with the maximum of three social contact experiences too (day 6).

Figure 2

Well-Being Levels and Social Contact Frequency on Each Day for a Participant with an Inconsistent Association Type



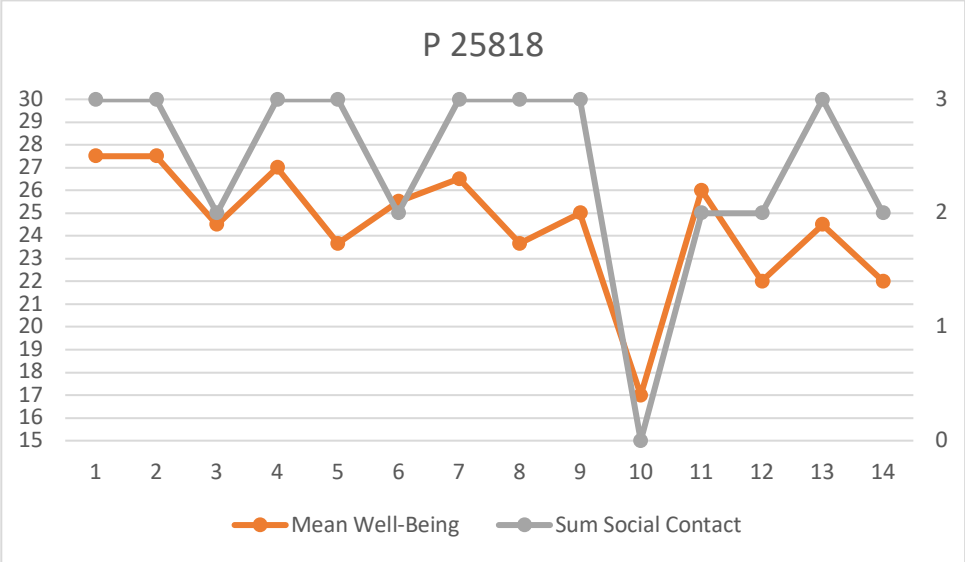
Note. Left y-axis refers to mean SWEMWBS score and right y-axis to frequency of social contact

Participant 25818 (Figure 3) "Positive Association Type". The fluctuation patterns of some members of the sample show a tendency for a positive association between daily well-being levels and social contact frequency, as exemplified by participant 25818 (Figure 3). Although, on some days well-being decreases if social contact frequency stays the same, well-being never does so when social contact frequency increases. Instead, an increase in social contact frequency is always coupled with an increase in well-being (days 4, 7, 11, 13). On most

occasions, also a decrease in social contact frequency comes with decreasing well-being levels. This fluctuation tendency is most obvious on day 10, but also visible on day three. Only on day six, well-being levels increase with decreasing social contact frequency, indicating a negative association.

Figure 3

Well-Being Levels and Social Contact Frequency on Each Day for a Participant with a Positive Association Type



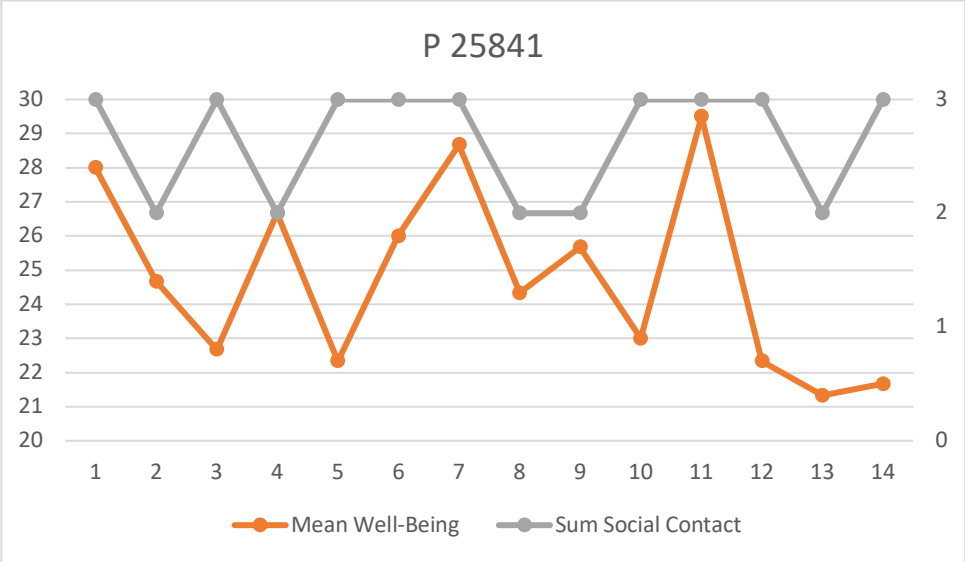
Note. Left y-axis refers to mean SWEMWBS score and right y-axis to frequency of social contact

Participant 25841 (Figure 4) "Negative Association Type". As participant 25842 (Figure 4) exemplifies, other members of the sample possess a fluctuation pattern that is characterized by more negative associations. For example, on days 3, 5 and 12 this individual possessed low well-being levels, while the maximum value of social contact occurrences was measured. On other days (e.g. days 4 and 9), social contact occurred comparatively less, but well-being levels were higher than on some days with more social contact. However, although a negative association can be observed for most days, other days show less clear or even positive associations (e.g. days 1, 7, 11). This highlights the potential for ambiguous and

inconsistent association patterns within one participant which characterizes large parts of the sample.

Figure 4

Well-Being Levels and Social Contact Frequency on Each Day for a Participant with a Negative Association Type



Note. Left y-axis refers to mean SWEMWBS score and right y-axis to frequency of social contact

The Relationship between Well-Being and Relationship Type

A significant and positive association was found between well-being and all relationship types, i.e. partner, close friend, family member, or acquaintance (Table 2). Social contact in any relationship form, comes with significantly elevated well-being levels, compared to the absence of social contact. However, the EM means of all conditions possess overlapping confidence intervals (CI), which is why no significant differences in the strengths of the association between the four categories of relationship type and state well-being can be concluded from the data (see Appendix D, Figure 2). In LMM analyses with a 90 percent CI, the upper bound of contact with acquaintances falls below the lower bounds of contact with close friend(s) and family members (See Appendix D, Table 2), which tends to speak in favor of a weaker association between well-being and acquaintances than between well-being and close friends(s), as well as family members. Related to normative scores, well-being levels remain

average under all five relationship type conditions, including the absence of social contact (Warwick Medical School, n.d.).

Table 2

Estimated Marginal Means for Relationship Type and Well-Being (N=32)

						95% Confidence Interval	
Type	EM Mean	Std. Error	df	t	p	Lower Bound	Upper Bound
No Contact	23.00	.31	721.97	73.49	< .001	22.39	23.62
Partner	25.75	.30	473.40	7.03	< .001	25.16	26.34
Close friend(s)	26.75	.37	806.56	9.01	< .001	26.03	27.46
Family members	26.60	.31	534.34	9.12	< .001	25.99	27.20
Acquaintances	25.15	.45	977.87	4.45	< .001	24.28	26.03

Note. No contact was used as the reference category

The Relationship of Well-Being and Setting of Social Contact

The association of well-being and the setting in which social contact occurs has also been found to be significant for each setting (Table 3). Findings indicate a positive relationship between state well-being and social contact that happens outside in person, at home in person, or online when comparing it to the association of state well-being levels and no social contact. It has to be noted that the confidence intervals of the three conditions overlap which is why no significant differences in the strengths of the association between the three categories of social setting and state well-being can be concluded from the data (see Appendix D, Figure 3). Related to normative scores, well-being levels remain average under all four social settings, including the absence of social contact (Warwick Medical School, n.d.).

Table 3

Estimated Marginal Means for Social Setting and Well-Being (N=32)

Setting	EM Mean	Std. Error	df	t	p	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
No Contact	23.03	.32	768.44	71.11	< .001	22.39	23.66
Outside, in person	26.91	.39	958.61	8.50	< .001	26.14	27.68
At home, in person	26.02	.22	317.44	8.93	< .001	25.58	26.45
Online	25.48	.45	1015.02	5.01	< .001	24.60	26.35

Note. No contact was used as the reference category

Discussion

The objective of the present study was to explore the relationship between social contact and university students' well-being by means of relating the frequency of social contact, the relationship type, and the social setting during social contact experiences to well-being levels.

Social Contact Frequency and Well-Being

As hypothesized, a higher daily frequency of social contact has been found to be associated with higher daily well-being levels at a between- and within-person level.

Between-Person Association. The found, significant but weak association implies that participants with a higher frequency of social contact on a particular day were slightly more likely to experience higher well-being levels than those with a smaller frequency of social contact on the same day. A lack of literature exists on the association between social contact frequency and well-being. Still, there is evidence that less frequent social contact leads to lower self-esteem, less perceived control, as well as a reduced sense of belonging and meaning, which all play a crucial role in the experience of well-being (Sander, Schupp & Richter, 2017).

Within-Person Association. As a result of examining intraindividual fluctuation patterns, all sample members could be grouped into one of three types: (1) a tendency for positive associations (2) a tendency for negative associations, (3) inconsistent associations.

A positive association (1) between social contact frequency and well-being levels indicates that increased well-being comes with a higher frequency, while decreased well-being occurs on days with less frequent social contact. Literature replicates this tendency in so far that people with high well-being levels tend to spend less time alone (Baumeister & Leary, 1995; Cacioppo & Cacioppo, 2014; Rook, 1984, Schotanus-Dijkstra et.al., 2015) and instead spend much time socializing (Diener & Seligman, 2002). Moreover, social contact was found to enhance well-being if it facilitates certain qualities such as a shared positive affect (Algoe, 2019), a feeling of being understood (Reis, Lemay Jr. & Finkenauer, 2017). For individuals who show a positive association pattern, this suggests that they gain well-being because they engage in social contact which provides these kinds of qualities. In turn, a lower frequency of this positive social contact can result in diminished well-being for them.

Other participants tended to either experience low well-being next to frequent social contact or high well-being next to little social contact, thus possessing a negative association (2). On the one hand, this could mean that their frequent, social interactions oftentimes do not encompass the previously mentioned qualities of positive social contact, resulting in social contact that is perceived as undesirable or stressful, therefore leading to a decrease in well-being. On the other hand, current findings seem to provide evidence for possible positive effects of solitude on well-being. Literature confirms that when time alone is used for privacy, relaxation, self-reflection, creative pursuits, and emotional regulation (Long, Seburn, Averill & More, 2003), solitude has the potential to reduce high levels of stress and arousal (Nguyen, Ryan & Deci, 2017) while promoting creativity, productivity and spirituality (Long et al.,2003).

Most participants' fluctuation patterns are characterized by mixed, inconsistent associations (3), implying positive associations on some days next to negative associations on other days. The high proportion of this association pattern type points out that most people cannot be characterized by just one way in which their well-being levels relate to their social contact experiences. How the frequency of social contact relates to well-being for different

individuals seems to be influenced additional factors, including the previously highlighted perceived quality of social contact.

Relationship Type and Well-Being

Compared to people with no social contact, those who had social contact with the partner, family, close friends, and acquaintances were more likely to report higher momentary well-being, as has been hypothesized. Literature generally replicates that social contact in any type of relationship, including partner (Gomez-Lopez, Viejo & Ortega-Ruiz, 2019), family, friends (Secor, Limke-McLean & Wright, 2017), and even acquaintances (Sandstrom & Dunn, 2014; Van Lange & Columbus, 2021) is more beneficial to well-being than a complete absence of social contact. The, additionally found, slight tendency of contact with close friends and family members benefiting well-being more than contact with acquaintances does could possibly be explained by the fact that close friends and family members provide relationships that are embedded in socially supporting qualities. Requena (1995) provided a picture of what these qualities include, “Compared to acquaintances, close friends are more likely to be responsive to one's troubles, to sense the nature, degree, and source of one's distress, and to engage in supportive behavior that is appropriate to one's needs, even if costly in time or effort.”. However, a lack of literature exists on the comparison between all four relationship types’ associations with well-being.

Social Setting and Well-Being

Current findings suggest that social contact in any social setting comes with higher well-being than no social contact. Contrary to the hypothesis, evidence for particular social settings possessing stronger associations with well-being than other social settings is not provided by this study’s results. Literature established a clear consensus that social contact which takes place in person, is positively associated with well-being (Nezlek et al., 2002). So far, the association between well-being and social contact which happens specifically outside of the home has not

been researched. The current findings add to literature by suggesting that it makes no difference for its association with well-being if face-to-face social contact happens outside or at home.

Contrary to current findings, most studies argue that contact in-person benefits well-being more than online contact does (Schiffrin, Edelman, Falkenstern & Stewart, 2010; Teo, Chan, Saha & Nicoladis, 2019). A considerable body of evidence even proves a negative association between well-being and online social contact, which can be partly explained by the simultaneous reduction of offline contact, leading to depressive symptoms and loneliness (Caplan, 2003; Kraut et al., 1998; Teo et al., 2019). A more distinctive perspective suggests a differentiation of online contact which functions as a supplement to offline contact, thereby providing an opportunity to increasing the positive effects of face-to-face social contact on well-being, or online contact which substitutes offline contact, thereby decreasing well-being. Moreover, in asynchronous online contact, the responsiveness of communication partners has been found to determine the direction of its association with well-being. If factors like these are fulfilled, online contact even can create a distinct type of connectedness feeling which also can influence the well-being of individuals positively (Cummings, Butler & Kraut, 2002). Additionally, the study took place during the Covid 19 pandemic, in which face-to-face contact was often not feasible, therefore leading to an increase in online contact behavior (Gioia, Fioravanti, Casale & Boursier, 2021). By presenting the only possible way of social contact at all, online contact might have become more valuable for many individuals and thus more important for their well-being, which could partly explain the found positive association between online contact and well-being.

Strengths and Limitations

One major strength of the current study is the experience sampling method of data collection, which links results to daily life experience by providing unique insights into the momentary interplay of social contact and well-being. ESM has the advantages of high ecological validity, reduced memory bias, and the possibility to take a within-person

perspective. This enables accurate generalizability of results and opens up efficient ways to implement them in real-life interventions (Hektner & Csikszentmihalyi, 2002, p. 234ff.; Scollon et al., 2009). Another advantage of the current study is that the Short Warwick-Edinburgh Mental Well-Being Scale, which was used to assess the well-being of participants, reliably captures the construct of well-being in its broadness by attending to eudemonic and hedonic factors (Haver, et al., 2015; Stewart-Brown et al., 2009).

Nevertheless, the study also inhabits limitations. One concern is lacking background details in the assessment of social contact, especially regarding the perceived quality of social contact (e.g. perceived as positive or stressful). Inclusion of this information could decrease speculation in finding explanations for the direction of individuals' between- and within-person associations. Another limitation is that the study design did not provide the possibility to indicate that contact occurred more than three times per day. The opportunity for participants to indicate their exact daily contact frequency (i.e. by one specific item asking for it) would have served the accuracy of analyses and thereby the distinctiveness of findings.

Implications and Future Research

The study aimed at getting reality-based insights into the daily associations between university students' well-being and social contact. Findings back up interventions that aim at fostering social connectivity in the increasingly impersonal university environment. An increased variety of offerings for creative expression in groups could be one way to increase connectivity while regarding every student's needs when it comes to utilizing social contact in order to feel well. One example implemented by Sonnone & Rochford (2020) is group art therapy, offered on campuses. Here, students' well-being is facilitated not only by a safe space to connect with others on a personal level but also by artistic expression of internal, personally relevant processes under therapeutic guidance. Exploring students' individual background characteristics that are necessary for effective utilization of social contact in order to enhance their well-being should be an aim of future research. Tailored social offerings, characterized by

a variety in group size and shared activity depending on a student's needs, should be a goal of universities.

Conclusion

The current study provided a reality-based and extensive picture of how the naturally occurring daily fluctuations of students' well-being are associated with several components of daily social contact experiences. Results indicate significant, positive associations between well-being and social contact in any type of relationship as well as in any social setting. However, no evidence for a particular category of relationship type or social setting possessing significantly stronger associations with well-being than another category could be detected. Moreover, weak but positive between- and within-person associations were found for the relationship of social contact frequency and well-being. Findings underline the importance of any social contact form for university students' well-being and thus encourage an increase of social contact opportunities in the university environment.

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Appendix A

Demographic Baseline Questionnaire

Questions

Q#1: How old are you?

Q#2: Please indicate your gender

1) ○ Male
2) ○ Female
3) ○ Other

Q#3: What is your nationality?

1) ○ Dutch
2) ○ Australian
3) ○ German
4) ○ Other

Q#4: What is the highest degree or level of school you have completed? *If currently enrolled, mark the highest degree already received.*

1) ○ High school graduate
2) ○ Bachelor's degree
3) ○ Master's degree

4) ○ Doctorate degree or higher

5) ○ Other

Q#5: If you are currently enrolled as student, what is your field of study?

1) ○ Social sciences (e.g. psychology, sociology or economics, social work or political sciences)

2) ○ Natural sciences (e.g. biology, physics or chemistry)

3) ○ Medical sciences

4) ○ Computer science

5) ○ Mathematics or statistics

6) ○ Arts

7) ○ Law

8) ○ Philosophy

9) ○ Theology

10) ○ Other

11) ○ Not applicable, I am currently not enrolled as student

Appendix B

Short Warwick-Edinburgh Mental Well-Being Scale

Below are some statements about feelings and thoughts. Please tick the box that best describes your experience of each **over the last week.**

Q#6: I've been feeling optimistic about the future

- None of the time
- Rarely
- Some of the time
- Often
- All of the time

Q#7: I've been feeling useful

- None of the time
- Rarely
- Some of the time
- Often
- All of the time

Q#8: I've been feeling relaxed

- None of the time
- Rarely

- Some of the time
- Often
- All of the time

Q#9: I've been dealing with problems well

- None of the time
- Rarely
- Some of the time
- Often
- All of the time

Q#10: I've been thinking clearly

- None of the time
- Rarely
- Some of the time
- Often
- All of the time

Q#11: I've been feeling close to other people

- None of the time
- Rarely
- Some of the time
- Often

- All of the time

Q#12: I've been able to make up my own mind about things

- None of the time
- Rarely
- Some of the time
- Often
- All of the time

Appendix C

Items on Social Contact

Q#13: Who did you spend time with **within the last 2 hours**? *(select the one category of people that you personally feel most connected to if you spent time with multiple people)*

1) ○ Partner

2) ○ Close friend(s)

3) ○ Family member(s)

4) ○ Acquaintances (e.g., colleagues / fellow students)

5) ○ This does not apply, I was by myself

Q#14: How did this contact take place?

1) ○ Outside home, in person

2) ○ At home, in person

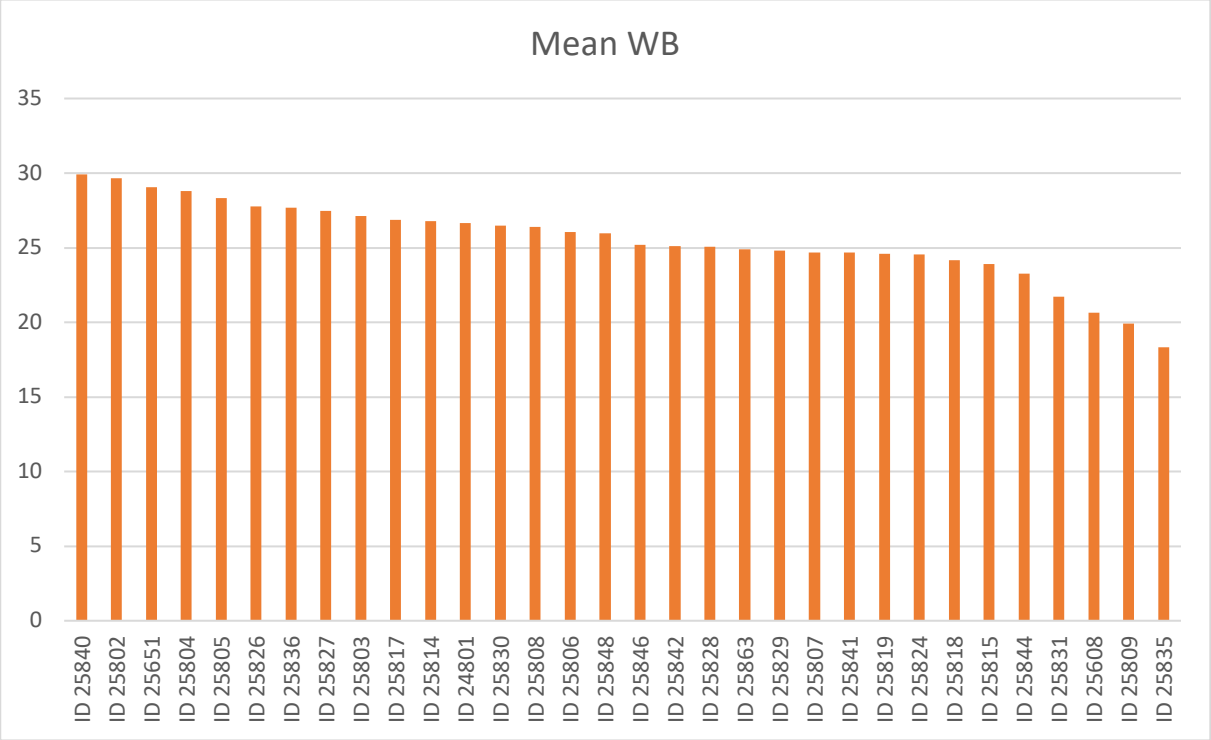
3) ○ Online (electronic devices)

4) ○ This does not apply, because I was by myself

Appendix D

Figure 1

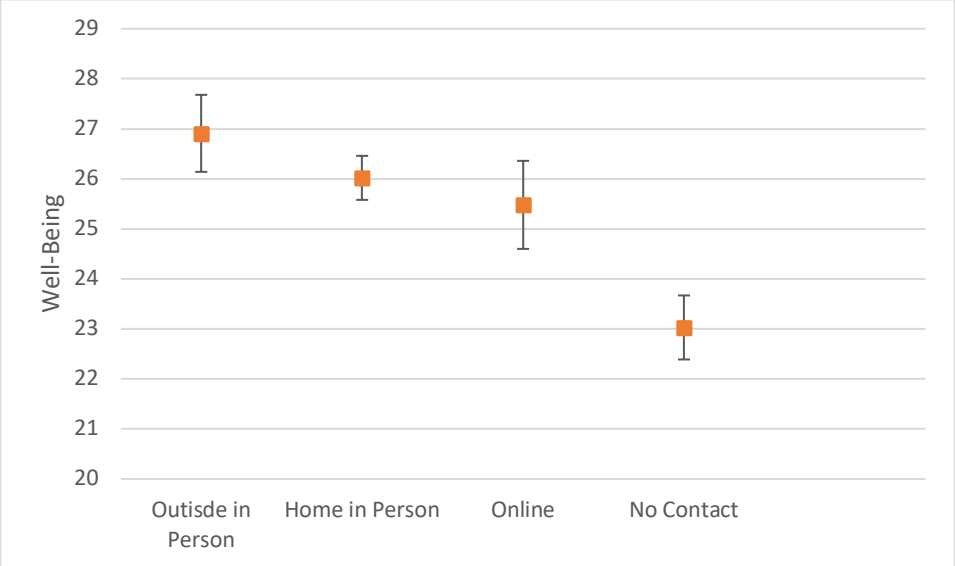
Estimated Marginal Means of momentary well-being for each participant over all measurement points (N = 32)



Note. X-axis refers to participant ID and y-axis to SWEMWBS score

Figure 2

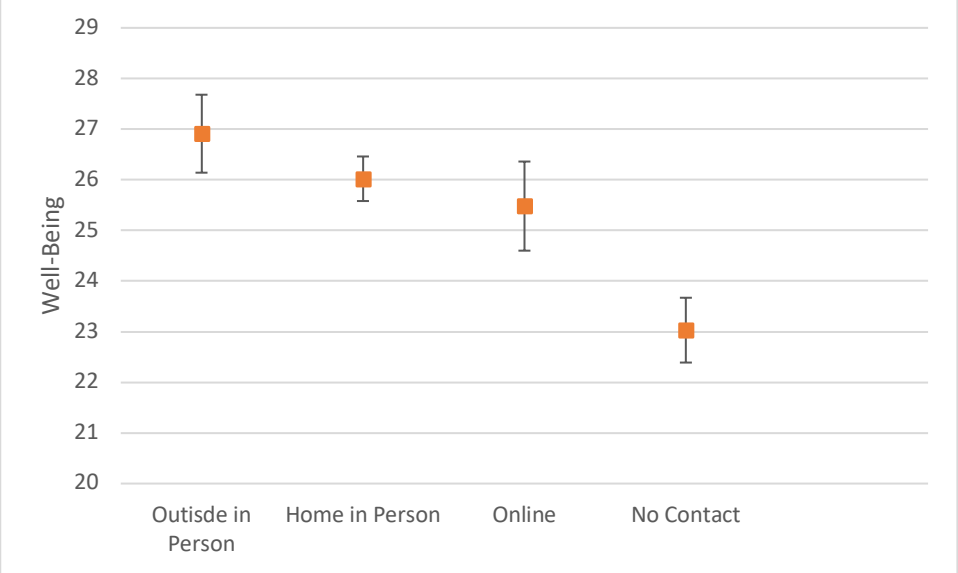
Unstandardized Estimated Marginal Means of Social Contact Setting (N = 32)



Note. 95 percent confidence intervals

Figure 3

Unstandardized Estimated Marginal Means of Social Contact Setting (N = 32)



Note. 95 percent confidence intervals

Table 1

Frequencies (n) and Percentages (%) of Sample Demographics (N = 32)

Variable	Mean±SD/n(%)
Age (Range: 19-32)	23.34±2.79
Gender	
Male	12 (41)
Female	17 (59)
Nationality	
Australian	1 (3)
German	26 (90)
Other	2 (7)
Total	29 (100)
Highest Degree	
Highschool	17 (59)
Bachelor	12 (41)
Total	29 (100)
Field of Study	
Arts	1 (3)
Natural Sciences	1 (3)
Social Sciences	22 (77)
Other	4 (14)
Not Applicable	1 (3)
Total	29 (100)

Note. Three participants did not provide demographic information

Table 2

Estimated Marginal Means for Relationship Type and Well-Being with a 90% Confidence Interval

						90% Confidence Interval	
Parameter	EM Mean	Std. Error	df	t	p	Lower Bound	Upper Bound
No Contact	23.00	.31	721.97	73.49	< .001	22.49	23.52
Partner	25.75	.30	473.40	7.03	< .001	25.26	26.24
Close friend(s)	26.75	.37	806.56	9.01	< .001	26.15	27.35
Family members	26.60	.31	534.34	9.12	< .001	26.09	27.11
Acquaintances	25.15	.45	977.87	4.45	< .001	24.42	25.89

Note. No contact was used as the reference category