

**The Association between Social Contacts and  
Well-Being in Daily Life  
An Experience Sampling Study**

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### Abstract

Research has extensively shown that positive relations are essential for one's well-being. However, not much research has been conducted on the association between different types of actual social contacts and momentary levels of well-being over time, and the relevance of the difference between the mere presence of contacts and the subjective quality of those. Studying this in a daily life setting can bring new understanding about how contact is exactly associated with well-being. Therefore, the goal of this study was to get insight on the association between social contact and well-being in daily life. A convenience sample of 48 participants completed questionnaires thrice a day over the course of 14 days by using the Experience Sampling Method. Momentary well-being was assessed by using selected items of the Positive and Negative Affect Schedule. Social contact has been measured by the type of the contact as well as by the subjective quality of contact. Linear Mixed Models showed positive associations between social contact and positive affect ( $B=0.41, p<.001$ ) and negative associations to negative affect ( $B=-0.21, p<.001$ ). Furthermore, they revealed that contact with friends ( $B=0.54, p<.001$ ) and a romantic partner ( $B=0.53, p<.001$ ) had the strongest positive association with well-being. The subjective quality of contacts showed a positive association to positive affect ( $B=0.47, p<.001$ ) as well as a negative association to negative affect ( $B=-0.24, p<.001$ ). The observed positive association between social contact and well-being is in accordance with previous research on the association between social contact and well-being. Since each type of contact is positively associated with well-being, it can be concluded that including social contact in one's daily life has a positive effect on well-being.

## **Introduction**

When one gets asked what makes their life worth living, they are likely to say that it is their friends, family, or romantic partner. This can also be seen by the studies of Maslow (1943), Diener and Biswas-Diener (2011), and Donaldson and Donaldson (2018). Maslow (1943) listed love and belonging in his hierarchy of needs. Additionally, many studies show that the quality of our social relations is the strongest predictor for happiness (Diener & Biswas-Diener, 2011). Furthermore, Donaldson and Donaldson (2018) argue that relations with other people are even a necessary condition for happiness, also in Western countries, which tend to be more individualistic. Therefore, it can be said that positive relations are important in our society.

Relations are positive when they involve some degree of mutuality in both individuals' behaviour (Hinde, 1979) and when they have interactions of high quality (Baker & Dutton, 2017). Additionally, these positive relations are positive states and processes within the relation, the experienced quality of the relation to the other person, as well as the outcome of the relation (Reis & Gamble, 2003). So, to include positive social relations in our society, it is important to have a degree of mutuality and high-quality interaction, which will result in positive outcomes.

### **Positive Relations and their Effect on Well-Being**

Research indicates that individuals who belong to supportive and helpful networks tend to have better physical and mental health, as well as higher life satisfaction (House et al., 1998). However, while relations are important for happiness, interpersonal conflicts and lower relation satisfaction increase daily challenges and decrease one's mood (Bolger et al., 1989; Hagerty & Williams, 1999; Mertika et al., 2020; Segrin & Rynes, 2009). First, social conflicts are perceived as the most upsetting stressor in daily life (Bolger et al., 1989) and a lack of social belonging is still considered to be a threat to survival (Mertika et al., 2020). Second, loneliness is also correlated with decreased well-being and is often a predictor of depression (Hagerty & Williams, 1999). Moreover, individuals who lack positive relations with others report to experience frustration and isolation in their social lives (Segrin & Rynes, 2009). Therefore, next to relations themselves, social contacts are essential.

### **Well-Being**

There are several theories that highlight the connection between positive relations and well-being. For instance, the two-continuum model of mental health, developed by Keyes (2002) and the broaden and build theory by Fredrickson (2004). The two-continuum model shows that well-being is, next to symptoms of mental illness, a critical factor to determine

mental health (Keyes, 2002). Both form two distinct continua, which are dynamic and fluid and, therefore, not permanent. Well-being can be categorized into emotional, social, and psychological well-being. First, emotional well-being includes happiness and experiencing positive emotions. It is defined by life satisfaction, the presence of positive affect, and the absence of negative affect (Bohlmeijer & Westerhof, 2021). Diener (1984) included emotional well-being, or rather emotional responses, as well as a cognitive judgment about life satisfaction to measure subjective well-being. Second, social well-being is characterized by five components: social integration, social contribution, social coherence, social actualization, and social acceptance (Keyes, 1998). This means one's sense of belonging to a community as well as contributing to society. Third, psychological well-being is defined by six factors; self-acceptance, autonomy, environmental mastery, positive relations, purpose in life, and personal growth (Ryff, 1995). Keyes (2005) argued that individuals with high well-being and no or low symptoms of psychopathology, have a complete mental health and are flourishing. A complete mental health is defined by feeling well, effective functioning of the individual within a community, and effective functioning of an individual (WHO, 2005). The two-continuum model is in line with the broaden-and-build theory of positive emotions (Fredrickson, 2004), which states that positive emotions lead to a broadening of perspective and attention. Positive novel thoughts, activities, and relationships facilitate the building of enduring personal resources, resilience, skills, and knowledge. These in turn positively affect health, survival, and fulfilment, which again leads to more positive emotions (Fredrickson, 2004). This theory can be applied to positive relations as well since one might be more open or exposed to a broadened perspective, attention, new thoughts, and activities due to positive relations. Hence, personal resources, resilience, and knowledge can be strengthened. Rohrer et al. (2018) suggest that if one has more social contact, they will feel more socially connected, which will make them experience more positive emotions. These theories show that well-being and positive emotions are important for several reasons, such as protecting individuals from negative affect and stress. Furthermore, they also show that positive emotions and positive relationships are often intertwined.

So, a variety of factors, like social contact, can play a role in fostering or protecting well-being. Additionally, several researchers highlight the importance of relatedness and positive relations in combination with well-being, such as in the Self-determination theory (Deci & Ryan, 2012) and in the PERMA model by Seligman (2011). Furthermore, high well-being and positive relations have a protective effect on mental illness and negative life events (e.g., Lin et al., 1985; Seligman, 2011; Hornstein & Eisenberger, 2017). In line with that,

social support can help individuals to cope with stress, unemployment, illness, accidents, or low income (House et al., 1988). Next to that, a study by Panzarella et al. (2006) found that people who receive positive feedback or a change of perspective by friends or families, experience a decrease in depressive symptoms.

Individuals who report having close relationships feel more competent (Mertika et al., 2020), which could be related to the fact that positive interactions can enhance problem-solving skills (Estrada et al., 1994). They also report feeling happier and less sad, and being more satisfied with their lives compared to individuals who do not have such relations (Siedlecki et al., 2014). Additionally, close relations are also associated with optimism (Srivastava et al., 2006). Along with that, more socially active individuals who report more supportive and empowering relations have higher rates of well-being, lower rates of disease and mortality, and overall better mental health (Ong et al., 2016). Moreover, subjective well-being increases together with the amount of commitment in relations. This is in accordance with the social support and integration perspective, which assumes that commitment in relationships gives emotional support, companionship, and a sense of belonging (Dush & Amato, 2005). Therefore, it can be said that relations act as a “safe place” in which an individual can find comfort and protection when facing difficulties. These relations can help individuals to see their strengths and highlight their positive personal development. Hence, positive relations can act as a buffer for stress and as a place for individuals to recover and grow.

### **Types of Relations**

There are different forms of contact that play a role in positive relations and can influence mental health. In early adolescence, a child's social well-being is mostly determined by their relation to parents and siblings, as well as teachers and peers. Later, it changes to parents and peers, and in adults, it evolves to romantic relations followed by their relations to friends, siblings, and their children (Mertika et al., 2020).

Parental relations have been shown to be important throughout one's life and serve as protective support and guidance for overall development. The relation leads to better well-being when there is more parental care, but less parental psychological control (Mertika et al., 2020). Van der Giessen et al. (2014) showed that when parents support their children's autonomy, they also increase their well-being levels. This is in line with the self-determination theory, which states that autonomy is a basic psychological need (Deci & Ryan, 2012).

Later on, friendships become crucial as well. Research shows that friendship in general is a significant factor of well-being (Diener & Seligman, 2002) and that there is a strong correlation between friendship quality and happiness (Demir & Weitekamp, 2007). This is due to the fact that friends provide emotional support, which can decrease stress and suppress negative emotions (Floyd et al., 2010). Friends can increase one's self-esteem by giving positive feedback as well as by expressing similar beliefs since they often share common interests (Argyle & Crossland 1987). Furthermore, positive peer relations are correlated with less risky behaviour (Telzer et al., 2015), which could be due to the fact that positive friendships are associated with easing development and better adaptation (Kornieko & Santos, 2016). Moreover, according to Avlund et al. (2004), having a best friend could lower the effects of negative life events and even protect against physical decline at an older age.

In adulthood, romantic relationships become more important, and marriage is one of the strongest predictors for well-being (Mertika et al., 2020). In fact, Dush and Amato (2005) found that married individuals were happier compared to unmarried individuals who were in romantic relationships. Problem-solving skills increase as well when being with a committed romantic partner (Driver & Gottman, 2004).

In addition to relations with family, friends, and significant others, research shows that work relations can be beneficial for an individual's well-being. Warren et al. (2017) show that work relations with colleagues, supervisors, or leaders at work are significant predictors for well-being and optional functioning at the workplace. Furthermore, they are linked to work outcomes as well as team flourishing (Ragins & Dutton, 2006). This is in accordance with Buunk and Verhoeven (1991) who state that employees who experience better relations at work, experience less negative and more positive feelings at the end of the workday. Concludingly, one can say that all different type of relations can have a positive impact on one's life and well-being.

### **Social Contact**

Humans have a basic need to belong and if they lack frequent interactions with close others, their health and well-being might decrease (Baumeister & Leary, 1995). This is in line with Allen et al. (2014) who propose that social interaction can provide happiness, higher satisfaction with life and a sense of belonging. Next to that, people report to experience more joy when socializing than during activities in which they do not socialize with others (Kahneman et al., 2004; Krueger et al., 2009). According to the Social Buffering Theory by Cohen and Wills (1985), social contacts can reduce a person's stress levels. This is because

being with others might help the individual to perceive stressful situations as less threatening and more controllable (Kirschbaum et al., 1995). Furthermore, social interaction that involves a discussion of a common topic can produce the same short-term benefits to executive functioning as brain-training games (Ybarra et al., 2008).

Besides mental health and cognitive benefits, research has also shown that both the quality and the quantity of social contacts are associated with several physical health benefits. These include the reduced risk of cardiovascular disease (Brummet et al., 2011), lower chances of cancer (Hibbard & Pope, 1993), and infectious diseases (Lee & Rotheram-Borus, 2001). More social contacts are also associated with greater longevity (Holt-Lunstad et al., 2010). It can therefore be said that having social interaction is beneficial for one's well-being.

### **Experience Sampling Method**

Most previous research on the relationship between social contacts and well-being is based on cross-sectional studies. However, often in psychological research, individual dynamic mental processes are the focus of the analysis. In order to gain a detailed insight into fluctuations of both social contacts and the momentary levels of well-being in daily life, and into within-person processes over time, a repeated measure design was chosen for this study (Myin-Germeys et al., 2018). An intensive longitudinal design is used, as a relatively high number of repeated measures was needed to get reliable and valid results. Therefore, this study used the experience sampling method (ESM) to gather information on daily social contacts, the subjective quality of those contacts, and well-being. ESM assesses participants repeatedly in their normal daily environment (Brown et al., 2011). By not creating a laboratory setting in which participants are aware of being observed, the ESM results are easier to generalize to their everyday lives. Furthermore, measuring behaviour and feelings immediately or just a short amount of time after they occur, minimizes retrospective bias in subjective constructs (Hogarth et al., 2007). Additionally, recall bias is smaller because memory accuracy is higher. Experience Sampling can be a reliable and ecologically valid design for describing variations in self-reports of mental processes. Validity is improved through repetition, and ecological validity is ensured as, with this form of data collection, individuals can be studied in their natural environment without using controlled experiments (Csikszentmihalyi & Larson, 2014). Reliability is strengthened because assessment error is reduced by the repeated measures over time (Verhagen et al., 2016). As there is a lack of stability and change in behavior and feelings over time (Curran & Bauer, 2011), a longitudinal study design also gives a more detailed picture of fluctuations within the individual.

Furthermore, longitudinal designs have greater statistical power since it controls factors that could cause variability between subjects, and fewer participants are needed for the desired effect size (Naiji et al., 2013).

### **Current study**

The study aims to examine the association between the occurrence and types of social contacts and well-being over time. By focusing on social contacts instead of social relations, this study wants to address a gap in the current literature that predominantly concerns the association between well-being and (perceived) positive relations rather than actual interactions. Furthermore, little research has been conducted on the relevance of non-romantic relations and contacts for well-being. Instead, most research was done on the differences in well-being between people in different kinds of romantic relationships (Soon et al., 2009). Additionally, this study explores the dynamic changes resulting from changes in the subjective quality of those social contacts. Besides, many previous studies, especially on romantic relations, are from times, in which the roles in marriages were different than they are today and were mostly done with a cross-sectional design. Using experience sampling will make the study more relevant and give better insights into the daily life of the participants (Myers et al., 2013).

It is important to distinguish between the association between the pure number of contacts and well-being, and the association between well-being and the subjective quality of those contacts. Literature suggests that positive relations are positively related to one's well-being, although it is not clear whether there is a distinction made between positive relations themselves and positive interactions one had with those relations (e.g., Mertika et al., 2020; Noble & McGrath, 2012). Besides, social relations and interactions are often used interchangeably in current literature (e.g. Bentolila et al., 2010; Krach et al., 2010).

Comparing whether there is a difference in temporal relations between social contacts and well-being and subjective quality of contacts and well-being is valuable because it can be important for possible implementation. It can be beneficial in improving one's mood and well-being and might even benefit in the prevention of (mental) illness, interventions, or even in therapy.

Therefore, the current study aims to answer the following research questions:

RQ1: How are momentary social contacts associated with well-being over time?

RQ2: How are different types of momentary social contacts associated with well-being?

RQ3: How is the subjective quality of momentary contacts associated with well-being?



Since optimal social engagement and social functioning are considered essential to well-being (Deci & Ryan, 2012; Keyes, 1998; Seligman, 2011), it is also likely to have a positive influence on hedonic well-being. People also report feeling more positive when engaging in social activities over non-social activities (Pavot et al., 1990). On the other hand, it is also assumed that individuals seek contact in moments of low well-being. Therefore, the first hypothesis (H1) is that *momentary social contacts have a positive association with well-being*. Research shows that all types of relations are relevant for well-being, but that the importance of each type can change depending on one's age and life stage. Since studies propose that work relations are mainly valuable for satisfaction and functioning at work, it is expected that this type of contact has a lower association with overall well-being. The same is expected with the interactions of each relation. Hence, the second hypothesis (H2) is *Contact with friends, family members, and romantic partners has a higher positive association with well-being than contacts with co-workers and fellow students do*. As already stated above, interactions are important and beneficial for one's well-being and functioning, so the third hypothesis (H3) is *the subjective quality of contact is positively associated with well-being*.

## Methods

### Participants

69 participants took part in the study. However, since only participants with a response rate of  $\geq 50\%$ , and who filled in the baseline questionnaire were included (Conner & Lehman, 2012), the results of 20 participants were removed from the analyses. Furthermore, one participant was excluded for being younger than 18 years old, which still left 48 participants, who had an average daily response rate of 81.25%. As the mean number of participants in previous ESM studies was 53, and the median 19 (Caine, 2016; Van Berkel et al., 2017), this number was seen as sufficient.

After the research had been approved by the Ethics Committee of the Faculty of Behavioural Sciences at the University of Twente (211225), the participants were gathered. Convenience sampling was used for this study, using mainly participants from the researchers' network. Also, 12 undergraduate psychology and communication science students from the University of Twente were recruited through SONA, the recruitment website for study participants from the BMS faculty of the university. The latter were rewarded with credits. All participants had to understand either English or German, be at least 18 years old, and had to have an Android or iOS smartphone that supported the Ethica App.

## Design and Procedure

The study had a longitudinal repeated measure design and used ESM with random-time-based sampling during fixed daily time intervals. The data collection took place over 14 days from Monday the 22nd of November until Sunday the 5th of December in 2021. This duration is in line with previous research (e.g. Van Berkel et al., 2018). At first, the participants received an e-mail with instructions on how to download and use the app ‘Ethica’ along with general information about the study and its procedure (Appendix A). Once participants registered on the app, they received an informed consent form they had to approve digitally (Appendix B). Afterwards, the participants received three daily questionnaires on their phones (Yearick, 2017), with each 12 items that were triggered at random times during the day. The first questionnaire had to be filled in at random moments between 10 am and 12 am, the second between 3 pm and 5 pm, and the third one between 8 pm and 10 pm. The questions could be filled in until two hours after they were triggered, and a reminder was sent after 60 minutes (e.g. Seitzinger et al., 2019; Van Berkel et al., 2018). Completing these questionnaires took approximately two minutes each. In addition, a baseline questionnaire had to be filled in once between the second and last day of the study, which consisted of demographics and four short questionnaires (Appendix C), which took approximately 10 minutes to complete.

## Materials

All questionnaires were administered in both English and German. The questionnaire used for the study included more scales than mentioned here, however, only the ones described here were used for this study.

**Trait Measurements.** The following questionnaires were part of the baseline questionnaire. The mentioned internal consistency values for the trait questionnaires were measured with Cronbach’s alpha. For this, every item of each scale was taken into account.

**Demographics.** Five questions were asked about age, gender, nationality, current occupation status, and the highest level of completed education.

**Positive Relationships.** The baseline questionnaire included the three items from the *positive relations with others* subscale of the Psychological Well-being scale by Ryff (1996). Participants answered statements such as ‘*Maintaining close relationships has been difficult and frustrating for me*’ with a seven-point Likert-scale (*strongly agree* to *strongly disagree*). The higher the scores, the higher are the positive relations. There was no specific recall period for the questionnaire. The scale previously had good internal consistency ( $\alpha=.76$ ; Ryff, 1989), but was questionable ( $\alpha=.67$ ) in this data set.

**Well-being.** The participants' well-being was measured in the baseline questionnaire through the Mental Health Continuum Short Form (MHC-SF). The self-reported questionnaire measured general well-being but also its three subscales, namely emotional, social, and psychological well-being (Keyes et al., 2008). The recall period was one month. *Emotional well-being* was assessed with three questions (e.g. *During the past month, how often have you felt happy?*) which were answered on a six-point Likert-scale (*never to everyday*). Those answers were the same for the entire questionnaire. *Social well-being* was measured with five items (e.g. *During the past month, how often have you felt that you had warm and trusting relationships with others?*) on the same six-point Likert-scale; *Psychological well-being* was measured with six items (e.g. *During the past month, how often have you felt that you liked most parts of your personality?*). Higher average total scores indicated higher well-being. The internal consistency in previous studies had been high ( $\alpha=.89$ ). In this data set, the internal consistency was good ( $\alpha=.83$ ), acceptable on its subscales *Emotional Well-Being* ( $\alpha=.73$ ) and *Social Well-Being* ( $\alpha=.75$ ) and questionable for *Psychological Well-Being* ( $\alpha=.67$ ). The scale has good convergent and discriminant validity in adults and adolescents (Lamers et al. 2011).

**Anxiety.** To measure anxiety, the 7-item General Anxiety Disorder scale (GAD-7) was used. Participants responded to seven items (e.g. *Over the last two weeks, how often have you been bothered by the following problems: Feeling nervous, anxious, or on edge?*) on a four-point Likert-scale (*not at all to nearly every day*). The scale had a recall period of two weeks, good reliability and good criterion, construct factorial and procedural validity, and had good internal consistency in previous studies ( $\alpha=.89$ ) (Spitzer et al., 2006) and an acceptable one in this study ( $\alpha=.76$ ).

**Depression.** Depression was measured with the Patient Health Questionnaire (PHQ-9), which had nine items (e.g. *Over the last two weeks, how often have you been bothered by any of the following problems: Little interest or pleasure in doing things?*) that were answered on a four-point Likert-scale (*not at all to nearly every day*). The recall period was two weeks. The PHQ-9 had excellent internal reliability ( $\alpha=.89$ ) in previous studies (Kroenke et al., 2001) and was acceptable ( $\alpha=.76$ ) in this study.

**State measurements.** The following questionnaires were part of the daily questionnaires (Appendix D). For each one, the test-retest reliability was measured. This was done by using split-half reliability. The mean scores for each scale for each participant were taken for both weeks and compared by a Spearman Correlation (Lee et al, 2018). Furthermore, it was checked how much each questionnaire was correlated to the trait

measurements, by conducting a Pearson's Correlation between the scales (Juniper et al., 1999).

***Social Contacts.*** *Social contacts* were measured in the daily questionnaires by asking one question (*Who did you spend time with since the last time you answered a questionnaire for this study? (online or offline) If more answers apply, only choose the longest contact*) with the following answer options: *Family member, friend, romantic partner, co-worker/fellow student, other*, and *I did not spend time with anyone*. This question is in line with previous research (e.g. Jung, 2021; Veltmann, 2021).

***Subjective Quality of Contacts.*** If people answered that they had a contact, their *Subjective Quality of Contacts* was studied through two items '*How pleasant did you experience the contact you had?*' and '*How positive did you experience the contact you had?*' which were answered with a seven-point Likert-scale (*not at all* to *very much*). A high score indicated pleasant and positive contacts. Both items had a strong and significant correlation ( $r=.85$ ;  $p<.001$ ) and a factor analysis was conducted which showed that the latent factor explained .85 variability in the items (Appendix E). The *Subjective Quality of Contacts* had a weak correlation with the baseline trait measurement of *Positive Relations with Others* ( $r=.27$ ;  $p=.06$ ). Furthermore, the scale had a strong split-half reliability ( $r_s = .62$ ).

***Positive and Negative Affect.*** Well-being in the daily questionnaires was assessed through positive and negative affect using the 8-item version of the Positive and Affect Schedule (PANAS-SF). The use of this questionnaire was based on previous studies (e.g. Hartmann et al., 2015; Schimmack, 2003). There were each four items for positive affect (*Please indicate the extent you currently feel cheerful/enthusiastic/satisfied/relaxed*) and four items for negative affect (*Please indicate the extent you currently feel anxious/insecure/down/guilty*) which were answered on a seven-point Likert-scale (*not at all* to *very much*). A high score indicated a high positive or negative affect, depending on the items. The PANAS-SF previously had a good internal consistency for positive affect ( $\alpha = .73$  to  $\alpha=.78$ .) and for negative affect ( $\alpha=.72$  to  $\alpha=.76$ ) (Thompson, 2007). The positive affect scale had a strong split-half reliability in this study ( $r_s = .66$ ), and the negative affect scale a very strong one ( $r_s = .83$ ). Positive affect had a significant positive correlation to *General Well-Being* ( $r=.38$ ;  $p<.001$ ) and negative affect had significant positive correlations to the *GAD-7* ( $r=.38$ ;  $p<.001$ ) and the *PHQ-9* ( $r=.42$ ;  $p<.001$ ).

## **Data Analysis**

IBM SPSS Statistics (Version 26) was used to analyse the data. First, the items for both *positive* and *negative affect* were transformed into two variables by calculating the mean

scores. The same was done with the *subjective quality of contacts*, as well as with the trait questionnaire variables of *positive relations*, the *GAD-7*, *PHQ-9*, and each subscale of the *MHC-SF*. For social contact, a dummy variable was created, coded either 1 for contact or 0 if no contact took place. Furthermore, each type of contact got a separate dummy variable, coded 1, or 0 for another contact and no contact at all. To determine significance, a cut-off score of  $p \leq 0.05$  was used for all analyses.

Linear mixed models were used for the analysis, using an autoregressive covariance structure (AR(1)) to model the repeated measures. Since data by the same participants was dependent, a multilevel analysis was needed to account for this dependency (West et al., 2006). An AR(1) covariance structure was chosen due to the assumption of homogenous variances and correlations that decline with distance (Kincaid, 2005). This was important, as not every participant responded at each possible time point (Jones & Boadi-Boateng, 1991).

To test the first research question about the association between momentary social contact and well-being, the dummy-coded *Social Contact* variable was the fixed factor in the Linear Mixed Model and *positive*, as well as *negative affect* were the dependent variables in the analyses.

When analysing the second research question, concerning the different types of contact, the dummy variables for each type of contact were compared as independent variables, while *No Contact* was the reference variable. Again, *positive* and *negative affect* were used as dependent variables. H2 was accepted if the confidence intervals for *Friends*, *Family Members* and *Romantic Partners* did not include the estimates for *Co-workers/Fellow Students* on *positive affect* and when the associations are significant.

To answer the last research question, all measurement points in which no social contact occurred were excluded as there was thus also no subjective quality of contacts. *Subjective quality of contact* was the fixed factor and respectively *positive* and *negative affect* were the dependent variables. Furthermore, graphs were created for several participants who either had a high or low score in *subjective quality of contact*, to show the association to *positive* and *negative affect* over time. Additionally, to compare the results with other studies, and to draw meta-analytical conclusions across them, variables were standardized into z-scores, and standardized estimates were reported in each effect size table.

## Results

### Sample Characteristics

The participants were 18 to 59 years old with an average age of 26 ( $M=25.79$ ,  $SD=10.89$ ) and most of the participants were either German ( $N=26$ ) or Dutch ( $N=17$ ). The

demographics of the participants can be found in Table 1, and the results of the baseline questionnaires in Table 2.

**Table 1**

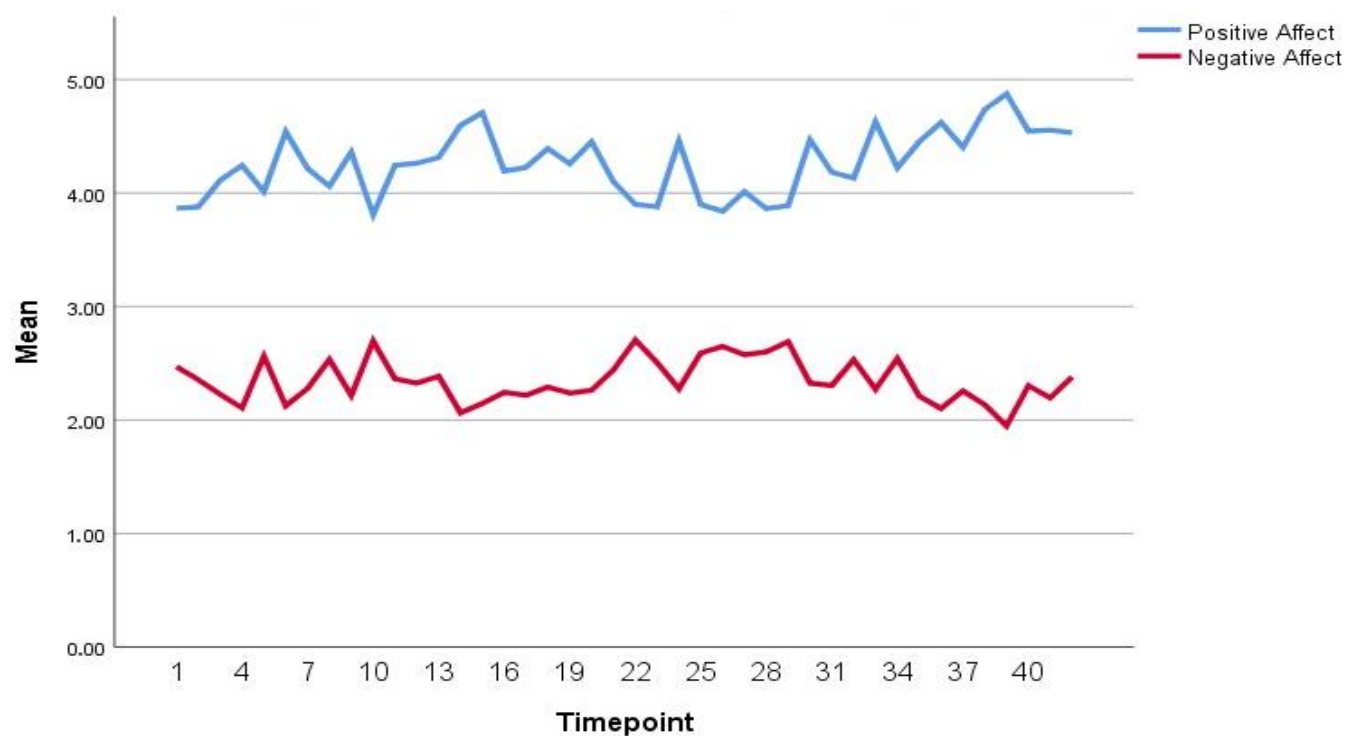
*Sample Characteristics (N=48)*

Variable	Category	Frequency	%
Sex			
	Male	14	29.2
	Female	34	70.8
Nationality			
	Germany	26	54.2
	Dutch	17	35.4
	Other	5	10.4
Highest Degree of Completed Education			
	Middle School	18	37.5
	High School	7	14.6
	Bachelor	14	29.2
	Master	8	16.7
	Other	1	2.1
Status of employment			
	Studying	22	45.9
	Working	9	18.8
	Self-Employed	3	6.3
	Studying and Working	14	29.1

**Table 2***Sample Characteristics of Trait Questionnaire (N=48)*

Variable	Mean (SD)
General Well-Being (MHC-SF)	3.01 (0.65)
Anxiety (GAD-7)	7.79 (3.68)
Depression (PHQ-9)	7.21 (4.28)
Positive Relations	5.25 (1.29)

To show changes in *positive* and *negative affect* in all participants over time, a line chart graph was created (Figure 1). The mean scores of all participants are shown for every measurement point. One can see that the changes in *negative* and *positive affect* were negatively associated and that both variables were not completely stable.

**Figure 1***Means for Positive and Negative Affect over Time***Social Contact**

To answer RQ1, a series of linear mixed models was conducted (Table 3). The results showed significant fixed effects between having social contact and well-being. The

unstandardized association between *social contact* and *positive affect* was positive ( $B=0.41$ ,  $p<.001$ ) and the negative association between *social contact* and *negative affect* was weaker but still significant ( $B=-0.21$ ,  $p<.001$ ). The significant results suggest that there was a positive association between social contact and well-being.



**Table 3**

*Summary of Linear Mixed Model with Social Contact and Types of Contacts as Predictors and Positive Affect and Negative Affect as Dependent Variables*

Predictor	Independent Variable	<i>Estimate</i>	<i>Standardized Estimate</i>	<i>SE</i>	<i>df</i>	<i>t</i>	Sig	Confidence Interval
Social Contact	Positive Affect	0.41	.32	0.07	1489.77	6.14	<.001	[0.28, 0.54]
Social Contact	Negative Affect	-0.21	-.17	0.05	1396.73	-3.80	<.001	[-0.31, -0.10]
Family Member	Positive Affect	0.34	.26	0.10	1605.45	3.43	.001	[0.14, 0.53]
Family Member	Negative Affect	-0.10	-.08	0.08	1502.10	-1.21	.23	[-0.26, 0.06]
Friend	Positive Affect	0.54	.42	0.08	1462.61	6.36	<.001	[0.37, 0.71]
Friend	Negative Affect	-0.26	-.21	0.68	1379.78	-3.86	<.001	[-0.40, -0.13]
Romantic Partner	Positive Affect	0.53	.41	0.09	1608.23	6.00	<.001	[0.36, 0.71]
Romantic Partner	Negative Affect	-0.30	-.24	0.07	1505.52	-4.07	<.001	[-0.44, -0.15]
Coworker / Fellow Student	Positive Affect	0.23	.18	0.09	1462.55	2.62	.01	[0.06, 0.41]
Coworker / Fellow Student	Negative Affect	-0.19	-.15	0.07	1378.90	-2.60	.01	[-0.33, -0.05]
Other	Positive Affect	0.15	.12	0.14	1382.79	1.09	0.28	[-0.12, 0.42]
Other	Negative Affect	0.04	.04	0.11	1329.64	0.40	0.69	[-0.17, 0.26]

*Note.* The standard deviation and confidence interval refer to the unstandardized estimates.

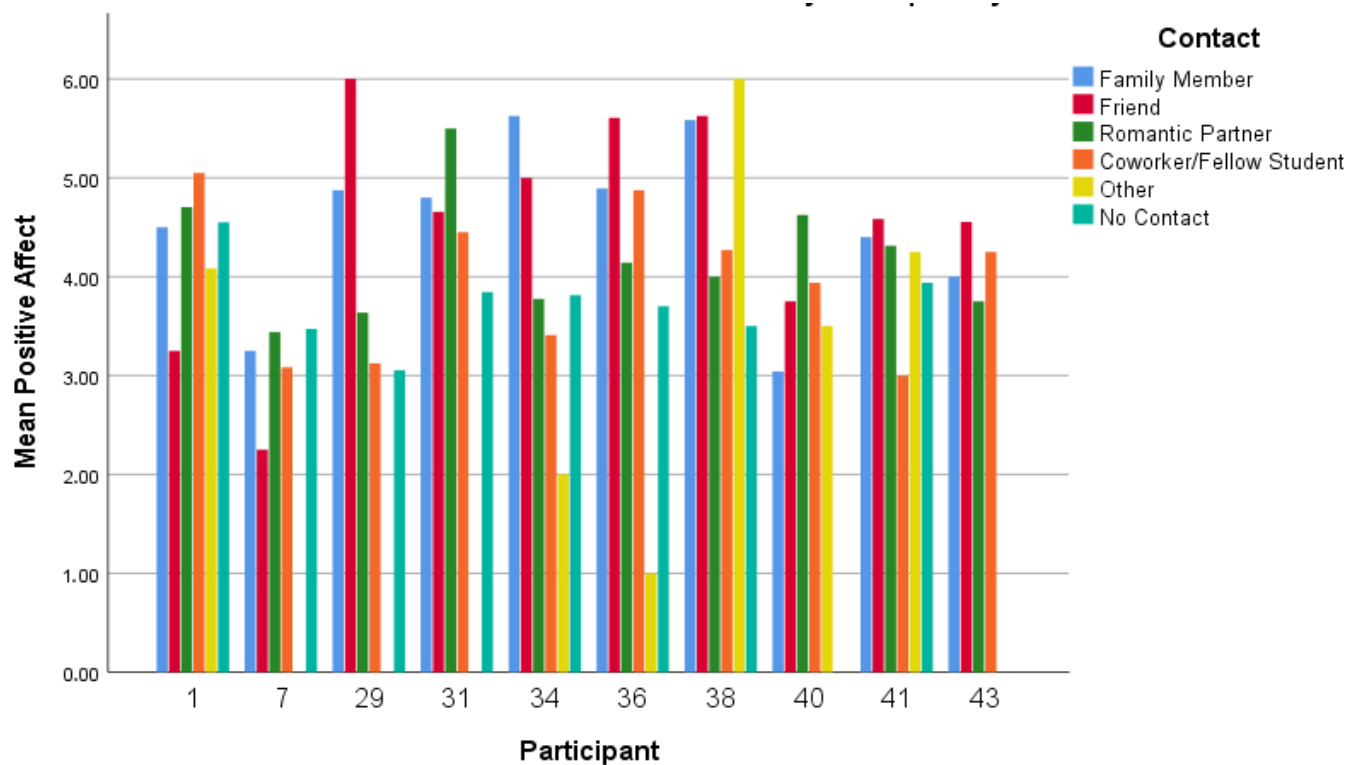
### Type of Contacts

To answer the second research question, linear mixed models were conducted (Table 3). It showed that the association with *positive affect* was strongest for *friends* ( $B=0.54$ ,  $p<.001$ ) and *romantic partners* ( $B=0.53$ ,  $p<.001$ ). There was a positive association with *family members* as well ( $B=0.34$ ,  $p=.001$ ). Since the estimate fell out of the 95% confidence interval of *friends* and *romantic partners*, there is a 95% certainty that the association between *positive affect* and *family members* was substantially different from the association to *friends* or *romantic partners*. The associations for *co-workers/fellow students* ( $B=0.23$ ,  $p=.01$ ) as well as to *others* ( $B=0.15$ ,  $p=.28$ ) were even lower. However, the estimate for *co-workers/fellow students* still fell within the confidence interval of *family members*. This means that the associations were not substantially different. Next to that, contact with *romantic partners* had a low negative and significant association to *negative affect* ( $B=-0.30$ ,  $p<.001$ ), which was similar for *friends* ( $B=-0.26$ ,  $p<.001$ ), while the other types of contacts had negligible correlations to *negative affect*.

Additionally, two graphs were created to show the differences of contacts on *positive* and *negative affect* for all participants that had contact with all types of contacts over the period of data collection ( $N=10$ ). One can see that participants 29, 36, 38, 41 and 43 all had the highest *positive affect* when seeing a friend, while participants 1 and 7 had the lowest *positive affect* then. Contact with a *romantic partner* was still associated the most with *positive affect* in participants 7, 31, and 40. Contact with *others* had the lowest association in participants 34 and 36 but was still quite high in the other participants who had contact with *others* (Figure 2).

**Figure 2**

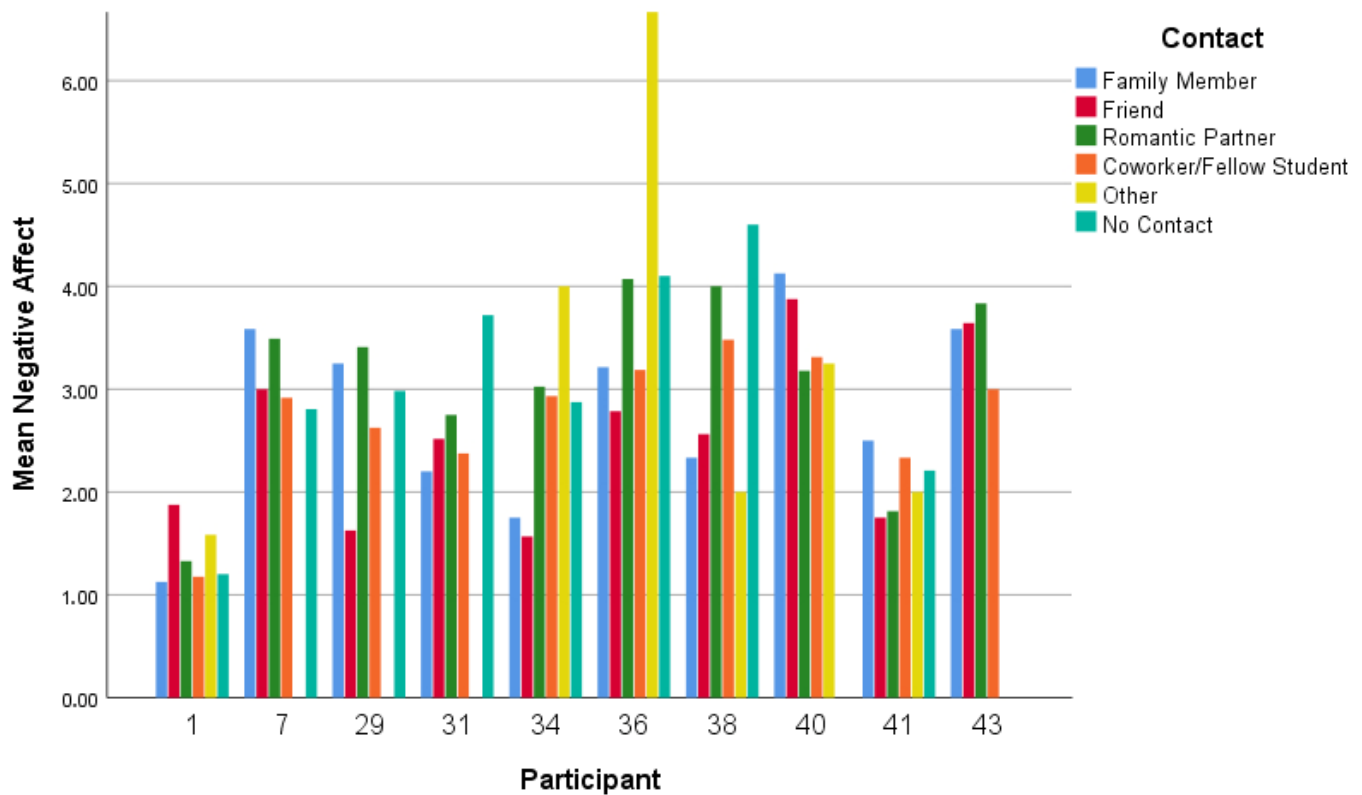
*Mean Scores of Positive Affect for each Type of Contact per Participant*



For *negative affect*, it shows that it was the highest for *others* in participants 34 and 36 and the lowest in participant 38. Next to that, contact with *friends* showed the lowest *negative affect* in participants 29, 34, and 41 but the highest association in participant 1. Contact with a *romantic partner* showed a higher *negative affect* in participants 7, 29, 31, 38, and 43 (Figure3).

**Figure 3**

*Mean Scores of Negative Affect for each Type of Contact per Participant*



Contact with family members, friends, and romantic partners was significantly associated with well-being and to a higher degree than to other contacts.

### **Subjective Quality of Contacts**

To answer the third research question and to analyse the relationship between the *subjective quality of contacts* and well-being, two Linear Mixed Models were conducted (Table 4). The unstandardized association between *positive affect* and the *subjective quality of contact* was positive ( $B=0.47, p<.001$ ) while the association to *negative affect* was negative ( $B=-0.24, p<.001$ ). The results therefore suggest that there was a positive relationship between well-being and subjective quality of contact.

**Table 4***The Association between Subjective Quality of Social Contact and Positive and Negative Affect*

Predictor	Independent Variable	<i>Estimate</i>	Standardized Estimate	<i>SE</i>	<i>df</i>	<i>t</i>	Sig	Confidence Interval
Subjective Quality of Social Contact	Positive Affect	0.47	.36	0.02	1235.64	19.96	<.001	[0.42, 0.51]
Subjective Quality of Social Contact	Negative Affect	-0.24	-.20	0.02	1116.80	-12.20	<.001	[-0.28, -0.20]

*Note.* The standard deviation and confidence interval refer to the unstandardized estimates.

To give a better picture of the associations, several line charts were created that demonstrate *positive* and *negative affect* as well as *subjective quality of contacts* over time in all participants, and also for some single participants. One can see that *negative affect* stayed quite stable over time, while *positive affect* and *subjective quality of contact* vary a little more. However, it is also visible in the graph, that there was a positive association between them, while *negative affect* was negatively associated with both (Figure 4).

**Figure 4**

*Means for Positive and Negative Affect and Subjective Quality of Social Contacts in all Participants over Time*

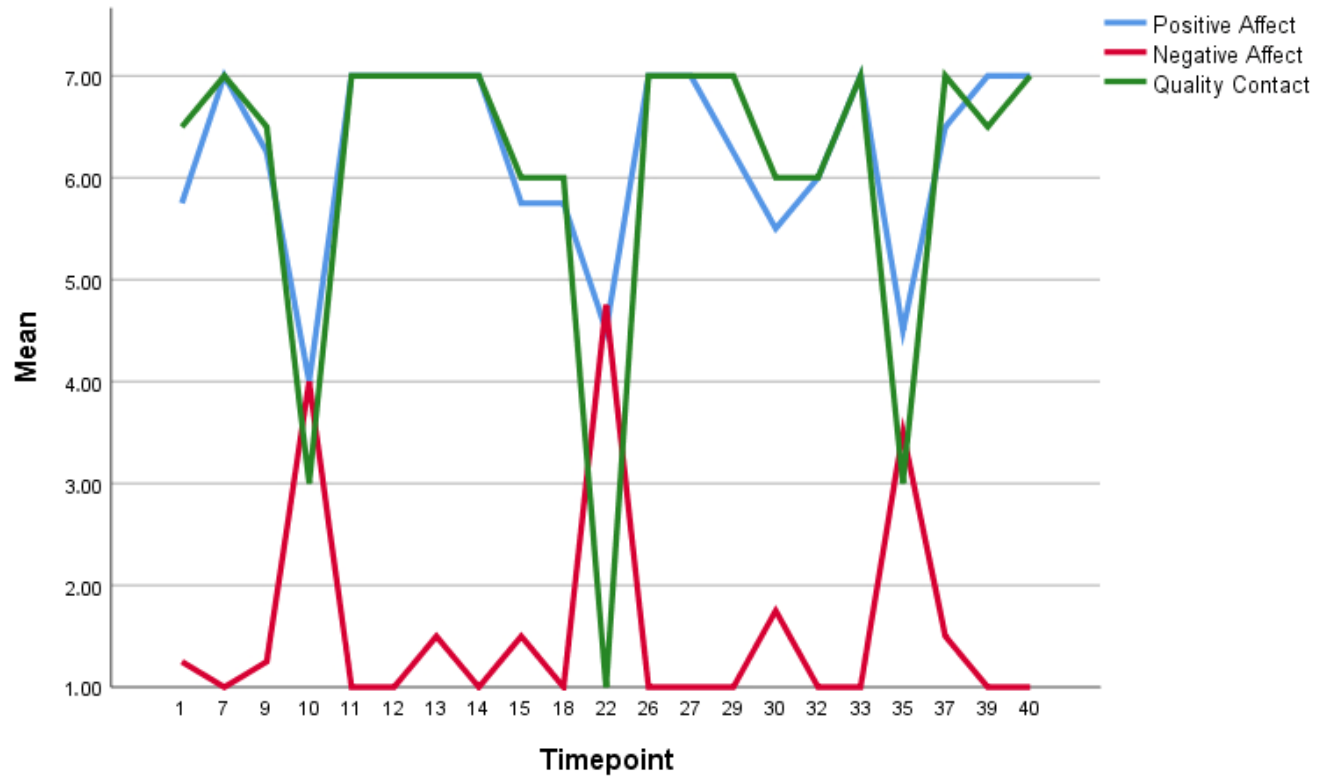


Participant 3 had a quite strong positive association between *positive affect* and *subjective quality of contact*, while both were negatively associated with *negative affect*. Whenever the contact was good, the participant had high *positive affect* and when the contact was perceived as less pleasant and positive, *negative affect* increased, while *positive affect* decreased (Figure 5).

**Figure 5**

*Positive and Negative Affect and Subjective Quality of Social Contacts over Time in Participant*

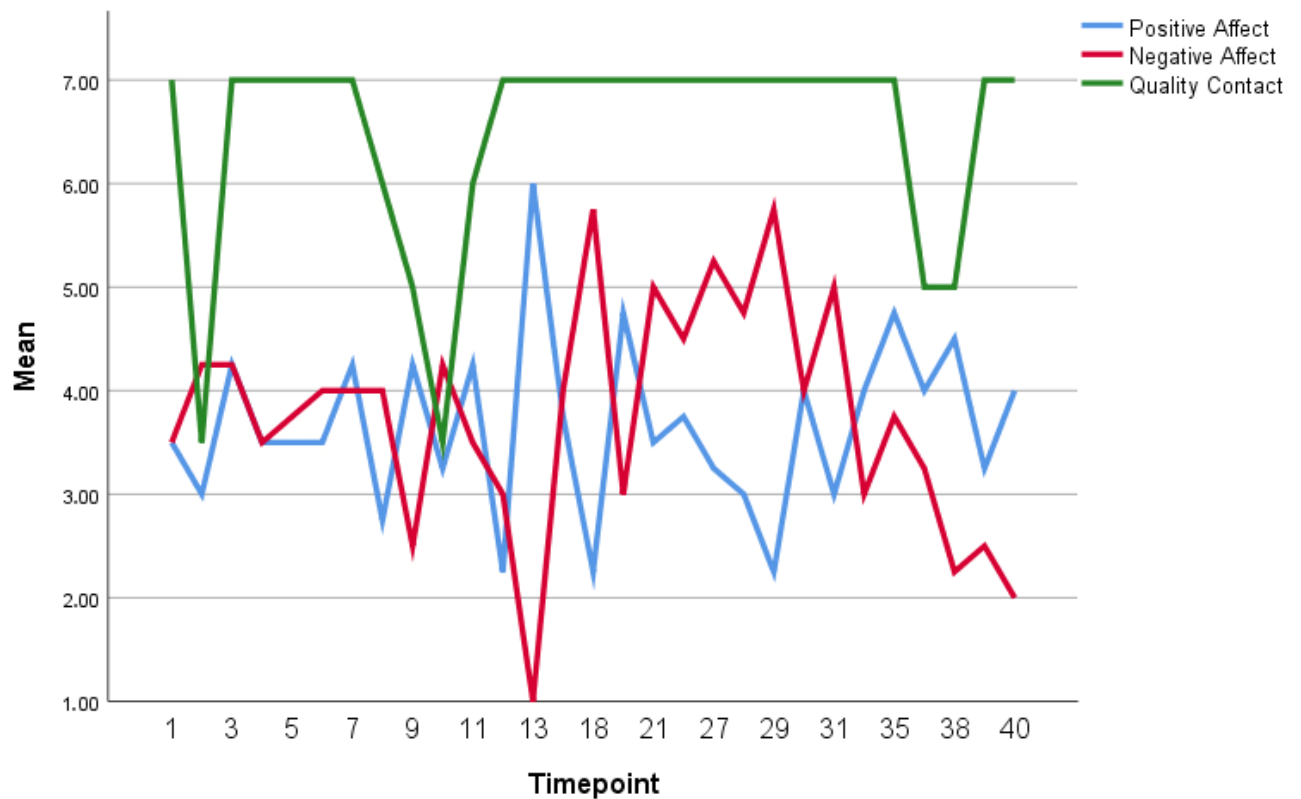
3



Participant 13 had a general high *subjective quality of contact*, and *positive* and *negative affect* did not show a high association to it, however, they did correlate negatively with each other. On measurement points 2 and 11, *subjective quality of contact* decreased and one can see that *positive affect* slightly did too, while there was also a slight increase in *negative affect* (Figure 6).

**Figure 6**

*Positive and Negative Affect and Quality of Social Contacts over Time in Participant 13*

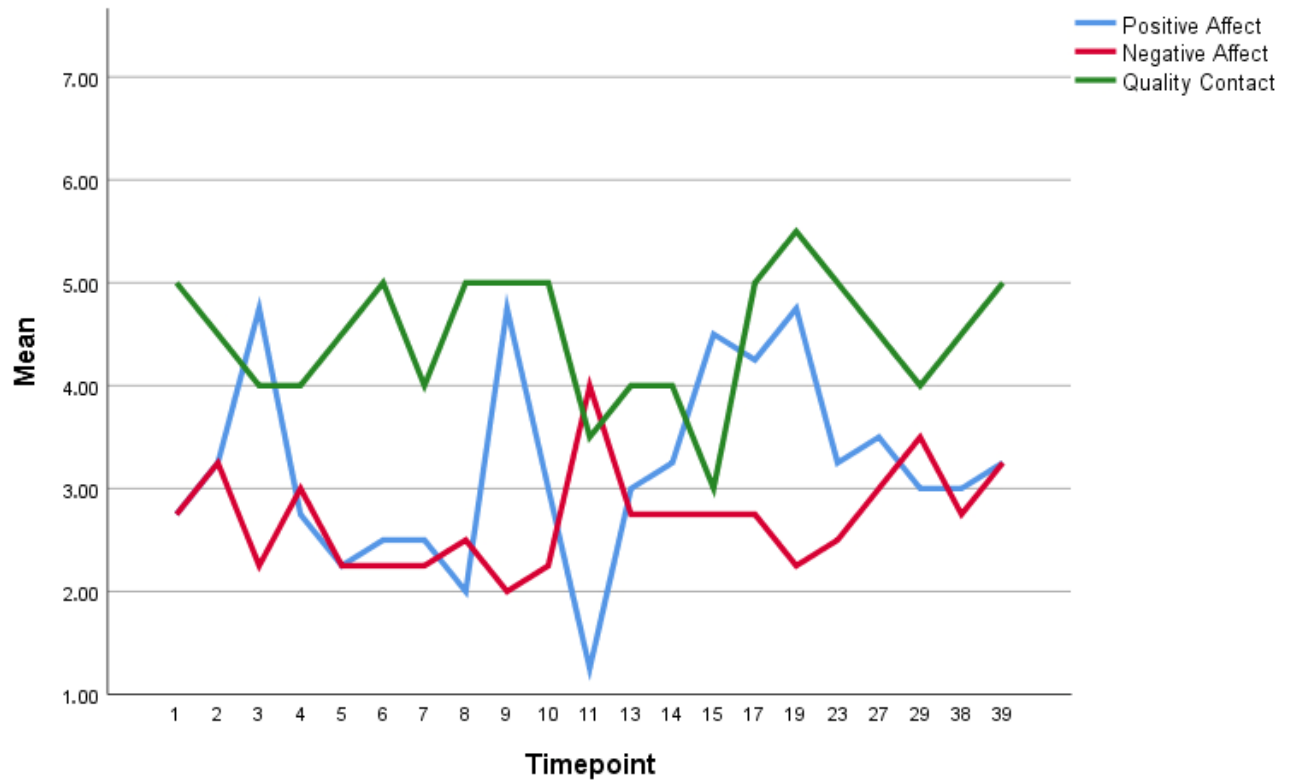


Again, there was a negative association between *positive* and *negative affect* in Participant 14. Especially on measurement points 2, 11 and 19 it is visible that if one of them increased, the other one decreased. There was only a slight association with both of them to the *quality of contact*, and during some points, there even was a negative association between it and *positive affect* (Figure 7).



**Figure 7**

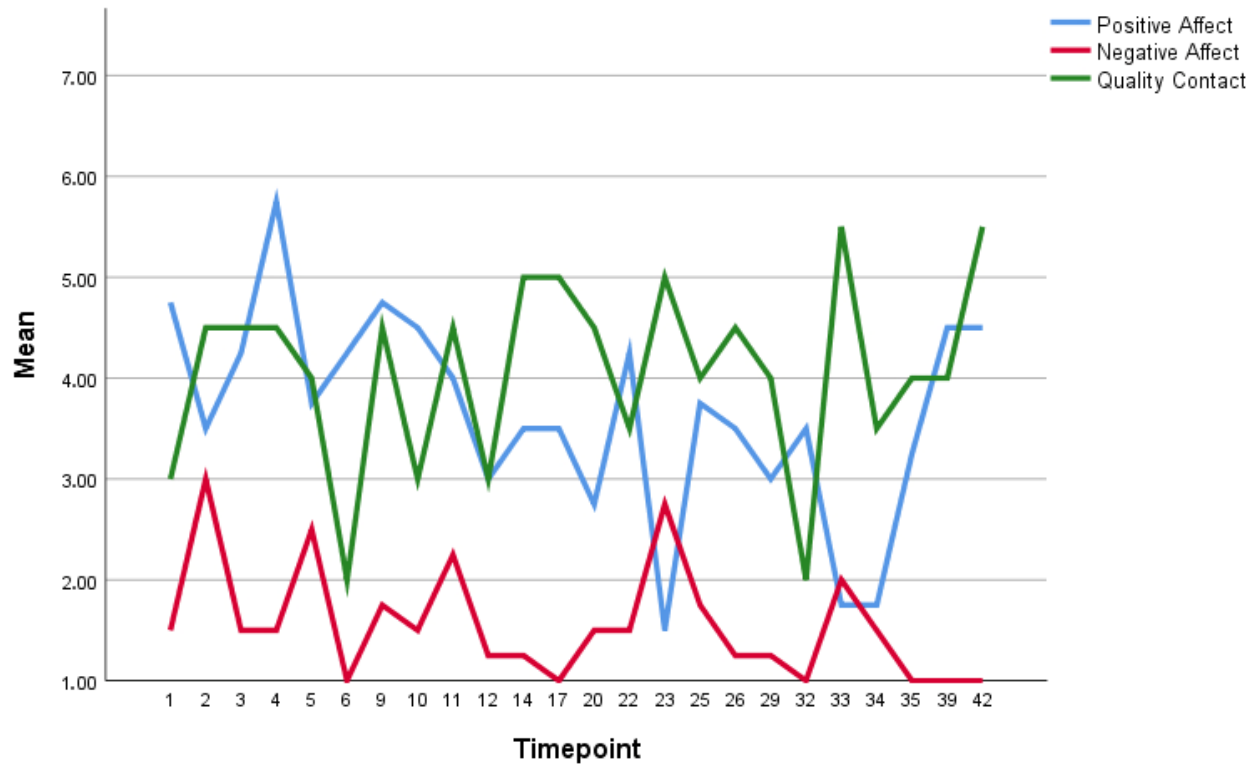
*Positive and Negative Affect and Subjective Quality of Social Contacts over Time in Participant 14*



Participant 20 showed a rather positive association between *subjective quality of contact* and *positive affect*, while both were negatively associated with *negative affect*. However, in measurement points 23 and 33 one can see that the participant had a high-quality contact, but the *positive affect* decreased while the *negative affect* increased (Figure 8).

**Figure 8**

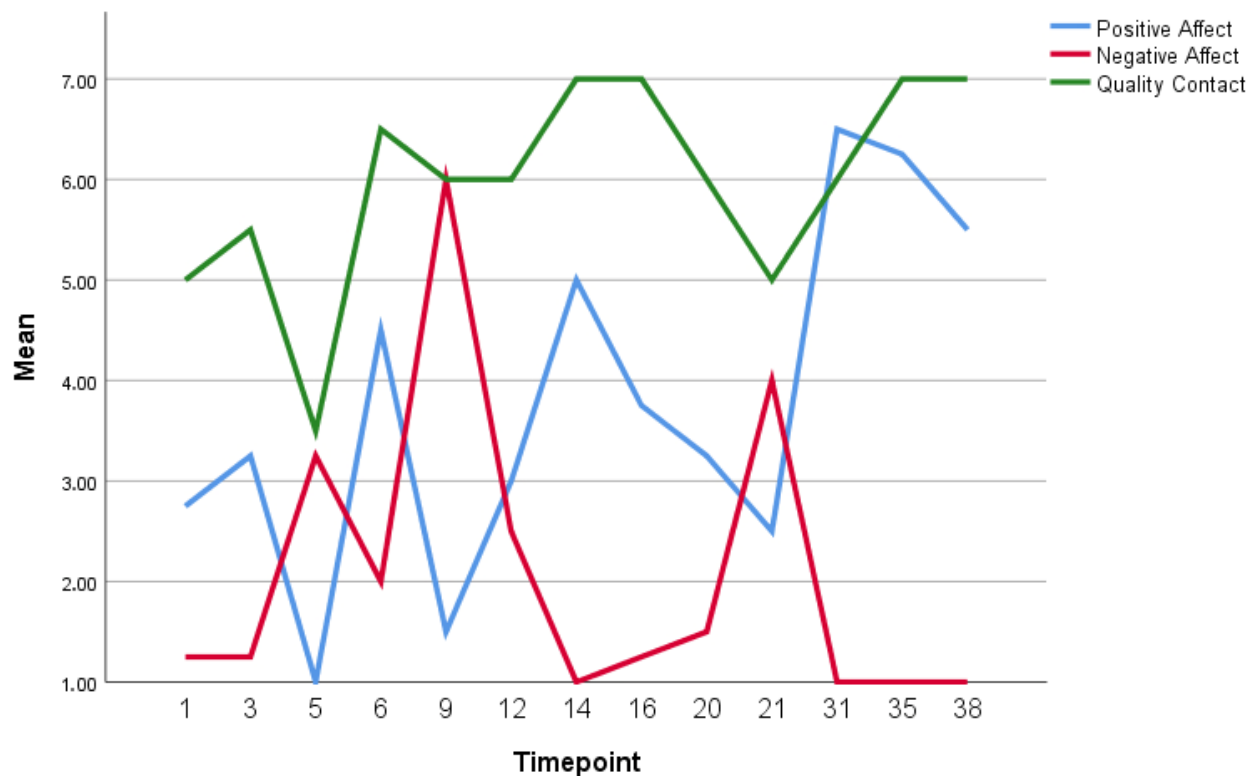
*Positive and Negative Affect and Subjective Quality of Social Contacts over Time in Participant 20*



Participant 46 had a general high subjective quality of contact, which was positively associated with *positive affect* and negatively with *negative affect*. Especially on measurement point 5, 14 and 21 one can see that if the *subjective quality of contact* changed, *positive affect* did too and that *negative affect* changed in the opposite direction.

**Figure 9***Positive and Negative Affect and Subjective Quality of Social Contacts over Time in Participant*

46



When comparing the results, it showed that the effect for *subjective quality of contact* had only a slightly higher association on *positive affect* than the mere presence of contact, which did not fall into its confidence interval. However, there was no substantial difference in *negative affect* when comparing it between the presence of social contact and its subjective quality. Next to that, contact with friends and the romantic partner had positive associations to *positive affect* as well as negative associations to *negative affect*. Therefore, it is suggested by the results that subjective high-quality contacts, peculiarly with friends and the romantic partner had a higher correlation with well-being.

### Discussion

This research aimed to analyse whether there is an association between the mere occurrence of social contact and well-being over time, between specific types of contacts, and the perceived subjective quality of contact to well-being. The first research question concerned the association between momentary social contact and well-being and it was hypothesized that there would be a positive association. Next to that, the second research

question dealt with the association between the momentary type of contact and well-being. It was assumed that contact with friends, family members and romantic partners would have a higher positive association to well-being than contact with co-workers or fellow students would. Lastly, the third research question was about the association between the subjective quality of a contact and well-being, and it was hypothesized that there would be a positive association as well.

As hypothesized, the analysis showed that social contact is positively associated with well-being, and therefore, the first hypothesis can be accepted. For this research question, only the mere presence of contact was of relevance, and not the specific type of contact itself. The results are in line with Sandstrom and Dunn (2013) who found that people had increased positive affect even after having a simple interaction with a barista at the coffee shop, but also that they felt a higher sense of belonging.

The results also suggest that contact with friends and with a romantic partner are associated with higher well-being than any other type of contact. However, since the association of contact with family members and co-workers/fellow students with well-being is similar in magnitude, the second hypothesis can only be partially accepted. One explanation for why well-being is higher with friends and romantic partners is that people usually choose friends and partners themselves, especially in comparison to family members and co-workers (Pahl & Pevalin, 2005). Thus, they will most likely choose them based on who they feel good being around with. Next to that, the sample consisted of mainly young adults, and research shows that friendships and romantic relations are the most important contacts at that age (Diener & Seligman, 2002; Mertika et al., 2020). Another reason is that people report to feel better and less lonely after interactions with familiar contacts (Vittengl & Holt, 1998). Furthermore, Schwanen and Wang (2014) suggest that having friends correlates positively with happiness and life-satisfaction. Positive affect might also be this high when being with the romantic partner because individuals often experience different emotions with partners compared to other contacts. This is also due to the fact that they often have a sexual and in general, a more physically close relationship than they have with others. This can lead to an increased level of oxytocin and a decrease of cortisol which can thus lead to pain relief, a higher sleep quality, an improved immune system and less chronic stress (Gianotten et al., 2021). Additionally, McHenry et al. (2014) also found that testosterone, which is then also increased, has antidepressant properties. Therefore, it is in line with the results of the current study, which suggest that positive affect increases, while negative affect decreases when being with the romantic partner. Being in more committed relationships is

also associated with higher subjective well-being (Dush & Amato, 2005). It is in accordance with Gilbert (2014) too, who proposes that there is a soothing system which is activated when receiving care and affection, which means that especially low arousal positive emotions are increased then. This could result from being with a romantic partner. Its function is to manage distress and to promote bonding. It is also connected to feeling safe, peaceful, and content. Furthermore, being with one's partner could reduce the threat system, which is associated with anxiety, anger and disgust (Gilbert, 2006). Furthermore, the results are in line with other research, for instance Driver and Gottman (2004) suggest that good everyday moments of couples can contribute to positive affect even during conflict. It also fits to the Marital Discord Model which suggests that the enhanced cohesion, emotional expression, and self-esteem which is enhanced by the relationship, can be beneficial when treating depression (Beach et al., 1994). Therefore, the results of the current study fit previous research when it comes to high well-being when being around friends or the romantic partner.

Contact with family members was positively associated with well-being too. This could have several explanations. For instance, when one receives support from family members, they may have higher optimism, positive affect and a better mental health (Symister & Friend, 2003). Furthermore, parenthood can give greater emotional support and a sense of belonging and meaning (Berkam et al., 2000). On the other hand, contact with family members has a lower association with well-being in this study than contact with friends and romantic partners. This could be because well-being can be impaired by arguments with family members but also by their criticism and high demands of family relationships (Thomas, et al., 2017). Furthermore, the study showed that contact with co-workers and fellow students has a similar association with well-being as contact with family members. One reason for this could be that many of the participants were students who might regard their fellow students as friends and thus report a higher positive affect. However, it could still be lower than well-being when being with friends due to the additional factor of being in a study environment, which might decrease one's positive affect.

Another reason for why it is positively associated to well-being could be that social support from co-workers and supervisors is linked to positive affect (Bergbom & Kimmen, 2014). Thus, the subjective quality of the contact could be increased, which is also associated with higher well-being. Furthermore, quality of work is another important predictor for well-being (Nilgün, 2017). If these conditions are given, it could explain that participants experienced similar levels of well-being with co-workers as they do with family members.

The results indicate that the more a contact was perceived as positive and pleasant, the

higher the positive affect afterwards. Therefore, the third hypothesis can be accepted. This is in accordance with Diener and Seligman (2002) who found that the quality of social relationships is one of the most consistent predictors of subjective well-being. Next to that, the subjective quality of social contact shows a strong correlation to life satisfaction, self-esteem, and happiness (Pinquart & Sörensen, 2000). Another reason why the subjective quality of contact affects well-being could be the quality of the conversation one experiences. Previous studies found that people with more meaningful conversations report a greater sense of relatedness (Reis et al., 2000) as well as greater happiness which are both positively related to well-being (Mehl et al., 2010). Additionally, when people share good news with others who react actively and constructively, the individual will have a longer lasting and more intense effect on well-being (Gable & Reis, 2010). Another positive impact on well-being is showing interest and a small act of kindness or offering words of encouragement (Feeney & Lemay, 2012). All those can occur during a high-quality social interaction which leads to an increase in positive affect. In general, perceptions of social support have also been associated with better well-being outcomes in stressful times (Gurung et al., 1997). In agreement with that, Piferi and Lawler (2006) found that people who tend to provide social support report to feel less depressed. Furthermore, being able to feel strong empathy and affection aids in building deeper friendships and relationships, which thus can lead to an even higher well-being (Ryff & Singer, 2012). Similarly, the finding can be connected to the broaden and build theory (Fredrickson, 2004) as positive emotions can lead to higher positive relations and therefore, people who are happy might experience better relationships. This is also in line with the finding that happy people often report to have rich and satisfying relationships (Diener & Seligman, 2002). On the other hand, people who have depressive symptoms or generally tend to have more negative affect, often experience a negativity bias (Gollan et al., 2016). This could lead to perceiving a contact as less positive and pleasant than people would who do not experience negativity bias.

It was seen in the data of this study that on some days, participants who had a high subjective quality of contact still had high negative affect. This could be perhaps if they felt bad before and thus asked for contact. Research also suggests that actual received support is associated with an increase in negative affect (Bolger et al., 2000). To conclude, the results of the third research question are in line with previous research.

### **Strengths and Limitations**

The main strength of the present study is the use of the experience sampling method since it measures momentary levels of positive and negative affect as well as the social

contact in real time in daily life. It gives unique insights into the person's momentary interplay of well-being and social contact, since the contacts are measured in more detail and with higher accuracy due to the lack of retrospective bias (Hogarth et al., 2007). This gives a valuable basis to implement the results in real-life interventions (Napa Scollon et al., 2009). Another strength is the high ecological validity of the study, which is increased by using ESM. Furthermore, the study had a response rate of 81.25% for the daily questionnaires. This is high compared to the average response rate by Van Berkel et al. (2017) which was 69.9%.

Nonetheless, this study comes with some potential limitations as well. Firstly, repeatedly answering the same questions and reporting one's moods might affect the participant's feelings (Napa Scollon et al., 2009). As one's self-awareness increases, it might also influence one's behaviour (Barret & Barret, 2001) and thus the self-report. Secondly, although ESM permits generalizability of the results due to the ecological validity and real-life settings, one still must be cautious before generalizing the results of this study to the greater population. The study aims to link social interactions in daily life with psychological processes, but since most of the participants were students, their social behaviour might differ from working adults (Napa Scollon et al., 2009). Thus, the sample of this study is not representative for the Dutch and German population. Thirdly, many of the participants were students who might live with housemates. Thus, 'housemates' could have been added as a social contact on the questionnaire to reduce the number of the response 'other'. Fourthly, since the questionnaire had two versions in different languages, the German participants might have interpreted questions differently than participants who completed it in English. However, using two languages is also a strength as more people could be included.

### **Implications and Future Research**

This research aimed to get a better picture of daily associations between social contact and well-being. These findings can be implemented to real life. As many of the participants were university students, it would be relevant to promote daily social contacts through their study. This could be achieved through project groups, associations, and university-based social events, as well as student accommodations where one lives together with several housemates (Rubin & Wilkinson, 2016). In order to implement the findings in a clinical setting, it is advised that the study will be replicated with a clinical sample. One reason for this is that the importance of social contact is reflected in some psychiatric disorders, in which interactions are part of the diagnosis (e.g. autism, schizophrenia and social phobia) (Krach et al., 2010). Especially individuals with past hospitalizations are at a higher risk of social isolation and having poor social relationships (Kent et al., 1995). In those cases,

particularly, rebuilding social relationships is essential for one's well-being and relapse prevention (Routasalo et al., 2006). Therefore, researching the type of contact and subjective quality of contact and their association to well-being might be relevant in a clinical sample.

Since the result did not give information about the role of duration of the social interactions, it would be interesting to measure this in future research and see whether there is an association in well-being with the length of contact.

Another relevant factor would be whether well-being changes during the interaction. Sometimes, individuals look for company due to low well-being, which makes it difficult to interpret the temporal nature of an association between social contacts and well-being, since there could be a reverse causation. Low well-being could result in social contact with the aim of comfort, but negative contact could also result in low well-being (Siedlecki et al., 2014). Studying well-being before, during and after an interaction through event-based ESM could give a better picture on the causation of positive affect and the contact. Furthermore, analysing how long well-being remains associated with contact could be beneficial by measuring how much time has passed since the interaction. This study did not distinguish between online and offline contacts, so separating those can give insights on whether there is a difference in well-being between them. Especially during the time of Covid-19, online interactions have increased. However, Agrawal (2021) found that digital communication negatively affects social interactions. On the other hand, it can also benefit the maintenance of friendships (Wellman et al., 2001). Therefore, researching online interaction is relevant too.

Although this research, alongside many other studies, found that contact is beneficial for well-being, it is still unclear why this is the case. It can be assumed that if one has high-quality interactions, they can ask for support when needed, but also that having good relations correlates with getting help and comfort, which can also lead to well-being (Diener & Seligman, 2002). Research could try to find a reason for this, perhaps by also measuring the differences between social connectedness, social support, and a sense of belonging regarding positive affect and the subjective quality of contact.

## **Conclusion**

This research gives insight into daily fluctuations and associations of social contact and well-being. Due to the Experience Sampling Method the gathered results are natural and accurate to daily life. The findings indicate that social contact and every type of contact is



significantly associated with higher positive affect and lower negative affect within individuals. Especially contact with friends and romantic partners is linked to higher well-being. Furthermore, the subjective quality of those contacts is positively associated with well-being. Therefore, it can be concluded that social contact is relevant and should be included in daily life, for instance in university settings.

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## **Appendix**

### **Appendix A**

#### **General Instructions English**

Hi [Name],

Amelie Schleich and Allegra Passmann from the University of Twente have invited you to join their "Mental health in daily life" research study. Please click on the link below to open the Ethica app and join the study:

<https://ethicadata.com/study/2107/>

If you don't have the Ethica app installed, the above link will ask you to download it first.

If you have any problem with the link, you can also download the Ethica app from Google Play or App Store, and after you log in, join the study using registration code 2107. Also, your username is [Email].

You will get three daily questionnaires, between 10 am and 12 am, 3 pm and 5 pm and 8 pm and 10 pm. You have 2 hours each to complete one and will get a notification about it, as well as a reminder in case you forget. Next to that, there will be a short baseline questionnaire that needs to be filled out by the second week.

If you come across any questions or problems, you can find our mail addresses below.

Amelie & Allegra

[a.c.schleich@student.utwente.nl](mailto:a.c.schleich@student.utwente.nl) [a.v.passmann@student.utwente.nl](mailto:a.v.passmann@student.utwente.nl)

### **Appendix B**

#### **Informed Consent English**

Dear participant,

Thank you for your participation in this study. Before you participate, it is important that you understand the goal of this research and what the study will ask from you. The purpose of this study is to find out how well being is related to several positive psychology constructs. To explore this relationship, we want to measure fluctuations in mental health in daily life to gather a more detailed picture of the dynamics of mental health.

For this study, we will ask you to fill in several questionnaires on your mobile phone. All questionnaires will be completed in the Ethica app. The study will start with a questionnaire concerning your demographics and general mental health. This initial questionnaire will take about 15 minutes to complete. Afterwards, you will receive three daily questionnaires per day

for a period of two weeks. Notifications will remind you about the next questionnaire. The questionnaires will be provided in the morning, afternoon and evening. One daily questionnaire takes approximately 3 minutes to complete. It is important that you answer the questionnaires as soon as possible. *Please make sure that you turn on the notifications for the Ethica app on your mobile device.*

The information that we collect from this research project will be kept confidential. This means that only the researchers have insight into your answers. All personal data (such as age, gender etc.) will be anonymized and will not be published and/or given to a third party. Your participation in this study is voluntary. You are free to withdraw from this study at any time and without giving a reason.

### **Contact information**

If you have any questions regarding this study, you can contact the researchers of this project Amelie Schleich (a.c.schleich@student.utwente.nl) and Allegra Passmann (a.v.passmann@student.utwente.nl)

### **Consent**

I have read and understood the information provided and had the opportunity to ask questions. I understand that my participation is voluntary and that I am able to withdraw at any time, without a reason or cost. I hereby voluntarily agree to take part in this study.

## **Appendix C**

### **Baseline Questionnaire**

#### ***Demographics***

---

How old are you?



18



---

What gender do you identify as?

☐ Male

☐ Female

☐ Other

---

What is your nationality?

☐ German

☐ Dutch

☐ Other

---

What is your current occupation?

☐ Working

☐ Self-employed

☐ Student

☐ Studying and working

☐ Not working

☐ Other

---

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

- ☐ Middle school (such as MBO, MTS, MEAO or Haupt- oder Realschule)
- ☐ High school (such as HAVO, VWO, HBS or Gymnasium/Berufsschule/Berufskolleg)
- ☐ Bachelor
- ☐ Master
- ☐ PhD
- ☐ Other

---

If you are a participant of SONA please indicate here your SONA number. **Note:** You can find the number in the confirmation email received from SONA. It is important to give us your number because otherwise, we cannot identify you and grant you the points.

### ***MHC-SF***

---

Below are some statements about feelings and thoughts. Please indicate how often you felt this way **during the past month**.



## Happy

- ☐ Never
- ☐ Once or twice a month
- ☐ About once a week
- ☐ About 2 or 3 times a week
- ☐ Almost every day
- ☐ Every day

## Interested in life

- ☐ Never
- ☐ Once or twice a month
- ☐ About once a week
- ☐ About 2 or 3 times a week
- ☐ Almost every day
- ☐ Every day

---

Satisfied with life

- ☐ Never
- ☐ Once or twice a month
- ☐ About once a week
- ☐ About 2 or 3 times a week
- ☐ Almost every day
- ☐ Every day

---

That you had something important to contribute to society

- ☐ Never
- ☐ Once or twice a month
- ☐ About once a week
- ☐ About 2 or 3 times a week
- ☐ Almost every day
- ☐ Every day

---

That you belonged to a community (like a social group, or your neighborhood)

- ☐ Never
- ☐ Once or twice a month
- ☐ About once a week
- ☐ About 2 or 3 times a week
- ☐ Almost every day
- ☐ Every day

---

That our society is a good place or is becoming a better place, for all people

- ☐ Never
- ☐ Once or twice a month
- ☐ About once a week
- ☐ About 2 or 3 times a week
- ☐ Almost every day
- ☐ Every day

---

That people are basically good

- ☐ Never
- ☐ Once or twice a month
- ☐ About once a week
- ☐ About 2 or 3 times a week
- ☐ Almost every day
- ☐ Every day

---

That the way our society works makes sense to you

- ☐ Never
- ☐ Once or twice a month
- ☐ About once a week
- ☐ About 2 or 3 times a week
- ☐ Almost every day
- ☐ Every day

---

That you liked most parts of your personality

- ☐ Never
- ☐ Once or twice a month
- ☐ About once a week
- ☐ About 2 or 3 times a week
- ☐ Almost every day
- ☐ Every day

---

Good at managing the responsibilities of your daily life

- ☐ Never
- ☐ Once or twice a month
- ☐ About once a week
- ☐ About 2 or 3 times a week
- ☐ Almost every day
- ☐ Every day

---

That you had warm and trusting relationships with others

- ☐ Never
- ☐ Once or twice a month
- ☐ About once a week
- ☐ About 2 or 3 times a week
- ☐ Almost every day
- ☐ Every day

---

That you had experiences that challenged you to grow and become a better person

- ☐ Never
- ☐ Once or twice a month
- ☐ About once a week
- ☐ About 2 or 3 times a week
- ☐ Almost every day
- ☐ Every day

---

Confident to think or express your own ideas and opinions

- ☐ Never
- ☐ Once or twice a month
- ☐ About once a week
- ☐ About 2 or 3 times a week
- ☐ Almost every day
- ☐ Every day

---

That your life has a sense of direction or meaning to it

- ☐ Never
- ☐ Once or twice a month
- ☐ About once a week
- ☐ About 2 or 3 times a week
- ☐ Almost every day
- ☐ Every day

### ***GAD-7***

---

Over the **last two weeks**, how often have you been bothered by the following problems?

---

Feeling nervous, anxious, or on edge

- ☐ Not at all
- ☐ Several days
- ☐ More than half the days
- ☐ Nearly every day

---

Not being able to stop or control worrying

- ☐ Not at all
- ☐ Several days
- ☐ More than half the days
- ☐ Nearly every day

---

Worrying too much about different things

- ☐ Not at all
- ☐ Several days
- ☐ More than half the days
- ☐ Nearly every day



---

Trouble relaxing

- ☐ Not at all
- ☐ Several days
- ☐ More than half the days
- ☐ Nearly every day

---

Being so restless that it is hard to sit still

- ☐ Not at all
- ☐ Several days
- ☐ More than half the days
- ☐ Nearly every day

---

Becoming easily annoyed or irritable

- ☐ Not at all
- ☐ Several days
- ☐ More than half the days
- ☐ Nearly every day

---

Feeling afraid, as if something awful might happen

- ☐ Not at all
- ☐ Several days
- ☐ More than half the days
- ☐ Nearly every day

### ***PHQ-9***

---

Over the **last 2 weeks**, how often have you been bothered by any of the following problems?

---

Little interest or pleasure in doing things

- ☐ Not at all
- ☐ Several days
- ☐ More than half the days
- ☐ Nearly every day

---

Feeling down, depressed, or hopeless

- ☐ Not at all
- ☐ Several days
- ☐ More than half the days
- ☐ Nearly every day

---

Trouble falling or staying asleep, *or* sleeping too much

- ☐ Not at all
- ☐ Several days
- ☐ More than half the days
- ☐ Nearly every day

---

Feeling tired or having little energy

- ☐ Not at all
- ☐ Several days
- ☐ More than half the days
- ☐ Nearly every day

---

Poor appetite *or* overeating

- ☐ Not at all
- ☐ Several days
- ☐ More than half the days
- ☐ Nearly every day

---

Feeling bad about yourself or that you are a failure or have let yourself or your family down

- ☐ Not at all
- ☐ Several days
- ☐ More than half the days
- ☐ Nearly every day

---

Trouble concentrating on things, such as reading the newspaper or watching television

- ☐ Not at all
- ☐ Several days
- ☐ More than half the days
- ☐ Nearly every day

---

Moving or speaking so slowly that other people could have noticed. *Or the opposite* being so fidgety or restless that you have been moving around a lot more than usual

- ☐ Not at all
- ☐ Several days
- ☐ More than half the days
- ☐ Nearly every day

---

Thoughts that you would be better off dead,  
or of hurting yourself

- ☐ Not at all
- ☐ Several days
- ☐ More than half the days
- ☐ Nearly every day

### ***Positive Relationship Scale***

---

Below are three statements that may apply to  
you to varying degrees. For each statement,  
please indicate how much it applies to you.  
Please answer openly and honestly.

---

Maintaining close relationships has been  
difficult and frustrating for me

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neutral
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly agree

---

People would describe me as a giving person,  
willing to share my time with others

☐ Strongly disagree

☐ Disagree

☐ Somewhat disagree

☐ Neutral

☐ Somewhat agree

☐ Agree

☐ Strongly agree

---

I have *not* experienced many warm and  
trusting relationships with others

☐ Strongly disagree

☐ Disagree

☐ Somewhat disagree

☐ Neutral

☐ Somewhat agree

☐ Agree

☐ Strongly agree

## Appendix D

### Daily Questionnaires

**PANAS**

---

How *cheerful* do you feel right now?

☐ 1 (not at all)

☐ 2

☐ 3

☐ 4

☐ 5

☐ 6

☐ 7 (very much)

---

How *enthusiastic* do you feel right now?

☐ 1 (not at all)

☐ 2

☐ 3

☐ 4

☐ 5

☐ 6

☐ 7 (very much)

---

How *satisfied* do you feel right now?

☐ 1 (not at all)

☐ 2

☐ 3

☐ 4

☐ 5

☐ 6

☐ 7 (very much)

---

How *relaxed* do you feel right now?

☐ 1 (not at all)

☐ 2

☐ 3

☐ 4

☐ 5

☐ 6

☐ 7 (very much)



---

How *anxious* do you feel right now?

☐ 1 (not at all)

☐ 2

☐ 3

☐ 4

☐ 5

☐ 6

☐ 7 (very much)

---

How *insecure* do you feel right now?

☐ 1 (not at all)

☐ 2

☐ 3

☐ 4

☐ 5

☐ 6

☐ 7 (very much)

---

How *down* do you feel right now?

☐ 1 (not at all)

☐ 2

☐ 3

☐ 4

☐ 5

☐ 6

☐ 7 (very much)

---

How *guilty* do you feel right now?

☐ 1 (not at all)

☐ 2

☐ 3

☐ 4

☐ 5

☐ 6

☐ 7 (very much)

***Social Contact***

---

Who did you spend time with since the last time you answered a questionnaire for this study? (online or offline) If more answers apply, only choose the longest contact.

☐ Family member

☐ Friend

☐ Romantic partner

☐ Co-worker/Fellow student

☐ Other

☐ I did not spend time with anyone

---

How pleasant did you experience the contact you had?

☐ 1 (not at all)

☐ 2

☐ 3

☐ 4

☐ 5

☐ 6

☐ 7 (very much)

How positive did you experience the contact you had?

☐ 1 (not at all)

☐ 2

☐ 3

☐ 4

☐ 5

☐ 6

☐ 7 (very much)

## Appendix E

### Factor Analysis Subjective Positive Contact

The correlation was below the threshold of .90 and, therefore, no item had to be removed (Foster et al., 2011). Second, a Principal Axis Factoring without rotation was conducted. As a result, one factor was identified as the factor underlying the two item *Subjective Quality of Contact* Scale (Table 2). This factor accounted for 85.31% of the variance of the data, which had to be  $\geq 50\%$  (Streiner, 1994). The communalities were .85 for both items, which must be  $> .20$  (Child, 2006; Samuels, 2017), and the average communality was .85 and so  $> .60$ , which is needed for this sample size (MacCallum et al., 1999). Besides, the items both had a factor loading  $> .30$  and there were no cross loadings  $> 75\%$ , so no item had to be omitted (Samuels, 2017). Therefore, it can be concluded that the two items *Positive Contact* and *Pleasant Contact* indeed measured one factor, the *Subjective Quality of Contact*.

**Table 5***Factor Structure of the two Item Subjective Quality of Relation Questionnaire*

Item	Factor Loading
	Subjective Quality of Relation
Positive Contact	.92
Pleasant Contact	.92
Percentage of explained variance:	85.31%