

Attachment, Stress and Emotions in Daily Life: An Experience Sampling Study

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Attachment plays an important role in emotional experience, interaction, and regulation, particularly in close relationships. Specifically, individuals with higher attachment-related anxiety and avoidance tend to report more psychological distress in general compared to more securely attached counterparts, but less is known about their emotional experience in daily life. We employed the experience sampling method to assess whether the individual variability in attachment-related anxiety and avoidance relates to momentary affective experience, stress, and perceived closeness to others in everyday social contexts. The research sample consisted of a total of 44 healthy individuals (23 females and 21 males) between age 18-40 years. Participants were administered the Experience in Close Relationships-Revised (ECR-R) and received a mobile device with pre-installed application that signaled them randomly 10 times per day for 6 days to complete questionnaires about their current experiences and social context. Individuals with higher attachment-related anxiety reported overall increase of negative affective states and stress in daily life. Attachment-related avoidance, on the other hand, was associated with an overall decrease of positive affective states with negative impact on the ability to benefit from proximity to others. These results indicate that a relatively stable attachment dimension translates to mental states fluctuations and social interactions in daily life, thus adding crucial ecological validity to the attachment theory.

Key words: attachment anxiety, attachment avoidance, positive affect, negative affect, Experience Sampling Method

Introduction

Interpersonal relationships play an important role in the life of every individual, and their

quality is linked to wellbeing and longevity (Sbarra & Coan, 2018). In particular, close relationships offer the opportunities to experience connectedness, acceptance, securi-

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ty, joy, and happiness. Attachment theory is one of the most well-known and long established theory concerning human relationships and personality development (see Cassidy & Shaver, 2016) including interpersonal functioning, emotion regulation, vulnerability and resilience (Fraley, 2019). Attachment in adulthood incorporates complex cognitive, affective and behavioral responses toward a variety of interpersonal situations. Furthermore, compared to child attachment, it serves other functions such as providing companionship, a sense of competence, a sexual bond and a sense of shared purpose (Platts et al., 2002). It has been shown that attachment insecurity has been associated with impaired emotion regulation (Thompson, 2016), less intense happiness, more negative affect and more stress in social interactions (Sheinbaum et al., 2015; Sitko et al., 2016). Little is known about how self-reported attachment-related anxiety and avoidance in close relationships translate to everyday life. In this framework, we find the knowledge of attachment-related anxiety and avoidance in combination with experience sampling to be possibly helpful in bringing light to the etiology of mental health difficulties, and creating the possibility of designing personalized intervention and providing insight into the process of change in psychotherapy in the future.

Attachment Framework

Attachment-related anxiety and avoidance are considered as latent constructs, which represent typical behavior associated with each dimension. Each dimension also represents a core emotion regulatory strategies, is associated with cognitive schemas about the self and others, also called internal working models (Fraley & Shaver, 2008; Mikulincer & Shaver, 2016), and determines attachment-triggered behavior (Brennan & Shaver,

1995; Brennan et al., 1998). The majority of the population (56-59% with potential variability based on attachment measurement) is believed to display a secure attachment style (Bakermans-Kranenburg & van IJzendoorn, 2009; Mickelson et al., 1997; van IJzendoorn & Bakermans-Kranenburg, 2008), characterized by low attachment-related anxiety and avoidance, leading to positive expectations about others, optimistic beliefs about distress management, and sense of trust and self-efficacy in dealing with difficult situations (Shaver & Mikulincer, 2002). As a result, in distress, securely attached individuals tend to seek support from others (Larose et al., 1999; Simpson et al., 1992) thus they benefit from social support as well as maintain meaningful relationships (Gere et al., 2013; Shaver & Mikulincer, 2002; Sheinbaum et al., 2015; Torquati & Raffaelli, 2004), which is considered to be a strong predictor of mental health and overall wellbeing (Siegel, 2012).

Attachment-related anxiety is characterized with a strong need to experience proximity, security, acceptance, and support (Shaver & Mikulincer, 2002), the absence of which is marked by anxiety, often prompting individuals to engage in hyperactivation strategies – working hard to maintain closeness and seek acceptance and proximity to others. Paradoxically, however, the presence of others may trigger more negative emotions, distress, rumination, which exaggerate rather than diminish overall feeling of insecurity (Mikulincer et al., 2010).

In contrast, individuals with increased attachment-related avoidance tend to keep distance from others and remain independent (Shaver & Mikulincer, 2002), often showing emotional flattening and social anhedonia (less positive, but also less negative emotions) in close relationships compared to more anxiously attached individuals (Li & Chan, 2012). Not surprisingly, relative to securely attached

individuals, those with avoidant style report experiencing lack of engagement in social interactions and boredom (Troisi et al., 2010).

Despite the wealth of confluent findings on adult attachment, the experience thereof, and the associated mental states and well-being, surprisingly little is known about how the attachment-related anxiety and avoidance translate to the minutiae of everyday situations and social interactions. This not only diminishes the ecological validity of the attachment theory, but also precludes the design of targeted, in-the-moment coping strategies for those experiencing attachment-related distress in social interactions (Myin-Germeys et al., 2018; Palmier-Claus et al., 2019).

We therefore employed the Experience Sampling Method (ESM) to capture the affective states, social context and the subjective experience several times a day for the duration of 6 days (Kirtley et al., 2019; Myin-Germeys et al., 2018; Palmier-Claus et al., 2019). Zooming into the subjective experience and measuring it multiple times a day, as individuals go about their daily lives, allowed us to test for associations between adult attachment-related anxiety and avoidance and state fluctuations in affective states, stress and social closeness in various social contexts. According to Watson, Clark, and Carey (1988) affectivity could be understood in terms of positive and negative affects. Positive affect represents the ability to experience pleasant emotions. Overall, it is the expression of well-being, ability to cope with the situation and perceive it as rewarding. It consists of feeling good, excitement, cheerfulness, and relaxation. On the other side, a negative affect is the representation of mental lability, subjective distress, and a wide range of negative emotions such as sadness, embarrassment, irritability, and anxiety. Based on the theory, one of the functions of attachment is emotion regulation (Shaver & Mikulincer, 2002). Therefore, in the case of

increased insecurity, it is possible to expect increase in distress, negative affective states, and emotional lability.

Based on the abovementioned evidence, we hypothesized that individuals with higher attachment-related anxiety and avoidance would show overall increased negative and reduced positive affect as well as increased daily stress. Since there are indications that attachment-related avoidance is associated with more emotional distance in relationships, compared to attachment-related anxiety, we hypothesized that in our sample individuals with increased attachment-related avoidance would report diminished closeness in the presence of others. Finally, due to the reports that in general, individuals with increased attachment-related anxiety and avoidance experience greater distress particularly in more intimate relationships, we hypothesized that these two attachment dimensions would be linked with more negative affective states and heightened distress in the presence of people close to them (attachment-related anxiety and avoidance as moderators of the association between social closeness and momentary affective states and stress).

Methods

Participants

The research sample consists of a total of 44 healthy individuals (23 females and 21 males) from Slovakia. We used a convenience sampling to recruit participants from the community via advertisements and word of mouth contact. The inclusion criteria were 1) no current or past diagnosis of mental illness; 2) age between 18 and 40, and 3) having completed secondary education. The Mean age of the sample was ($M = 26.27$ years, $SD = 4.87$) ranging from 19 to 39 years. Mean age of females ($M = 26.04$ years, $SD = 4.20$, $Md =$

26.00) and males ($M = 26.52$ years, $SD = 5.50$, $Md = 26.00$). Gender differences in age were not significant $t(42) = -0.32$, $p = .75$, $d = 0.10$, 95% CI [-3.51, 2.55]. 65.2% of females had a romantic partner compared to 57.1% of males, with no significant interaction between gender and partner status $\chi^2(1, N = 44) = 0.30$, $p = .58$.

The participants showed a satisfactory compliance resulting in ($M = 46.07$, $SD = 9.49$) out of a maximum possible 60 ESM assessments [77% which is comparable to similar protocols (Vachon et al., 2019)].

Materials

Attachment measures. *The Experience in Close Relationship – Revisited* questionnaire (ECR-R; Fraley et al., 2000, Slovak translation by Bieščad & Hašto, 2010), consists of 36 items describing the feelings in close relationships that differentiate two dimensions of attachment-related anxiety and avoidance in close relationships. Each dimension is measured by eighteen items on the Likert scale (1 – totally disagree, 7 – totally agree). The resulting value is the average of all items representing a particular dimension. The Slovak version of the questionnaire has excellent psychometric qualities and is often used as a self-measuring tool of relationships (Rozvadský Gugová et al., 2014). Reliabilities for ECR-R subscales in this study were excellent ($\alpha_{anxiety} = .912$ and $\alpha_{avoidance} = .923$).

Experience sampling method. We assessed the in-the-moment experience of participants during 6 consecutive days. Each participant received a mobile device that sent a notification 10 times a day at random moments between 8:00 and 22:00. Each notification was a prompt to complete up to 38 items about current positive and negative affect and stress level, social context and the appraisal thereof rated on a 7-point Likert scale (1 – disagree,

7 – totally agree). One binary-choice item was used to select if the participant was alone or within company of somebody (based on the choice, there were a slightly different sets of questions about the company or about the situation of being alone) and one multiple-choice item was used to select who the participant was with at the moment, if not alone.

Positive and negative affect. The selection of items for measuring current positive and negative affect were derived from the *PANAS Questionnaire* (Watson et al., 1988). Similar protocols were used in previous studies with satisfactory results and a sufficient degree of fluctuation between subjects depending on different situations (see e.g., Wichers et al., 2012, 2015). Using principal component factor analysis, we identified Negative affect (NA) as the average of four items “*I feel ashamed*”, “*I feel irritated*”, “*I feel anxious*” and “*I feel down*”. All items had a high loading factor of (0.75, 0.81, 0.82, and 0.81) and *Cronbach’s* $\alpha = .81$. Positive affect (PA) was constructed as the average of four items: “*I feel good*”, “*I feel relaxed*”, “*I feel cheerful*” and “*I am excited*”. All items had a high loading factor of (0.88, 0.84, 0.90, and 0.70) and *Cronbach’s* $\alpha = .84$.

Stress. Conforming to previous ESM research (Myin-Germeys et al., 2001; Myin-Germeys & van Os, 2007) of fluctuations in subjective stress, participants rated on 7-point Likert scale the following items: *I feel stressed*, *This is a pleasant situation (reverse-coded)*, *This is an unpleasant situation, I would prefer to avoid this situation*. Principal component factor analysis showed a high loading factor of the items (0.74, 0.84, 0.86, and 0.86) with *Cronbach’s* $\alpha = .85$.

Social company and closeness. The participants were required to indicate who they were with (if not alone) at each moment by choosing one of the categories on a multiple-choice item: romantic partner, parents,

siblings, their own children, other relatives, friends, colleagues, neighbors or others. If the participant was with multiple categories of people, he or she was instructed to pick the most important category. If the participant indicated to be in the company of someone, the closeness of the company was measured with the item: *"This company is close to me"* on a 7-point Likert scale (1 – disagree, 7 – totally agree). It was explained to the participants that we are interested in emotional closeness and not a physical one. If the participant indicated to be alone at the moment of notification, we did not ask about the closeness of the company, so the item was not measured.

Procedures

Data collection took place over a period of five months starting from January 2018 until July 2018. First, participants who were eligible to take part in the study signed an informed consent approved by the university's internal review board, followed by the completion of the online Experience in Close Relationships (ECR-R) questionnaire. Then, all participants received the dedicated mobile devices with a single installed app (mobileQ – Meers et al., 2019), and the ESM procedures were explained. Together with the investigator, each participant filled out a demo questionnaire to ascertain whether the items and procedures were clear. Participants also confirmed that they did not plan to do any unusual trips or activities during the duration of the assessment period. During the subsequent six days of the study, an investigator contacted each participant at least 1-2 times to make sure the procedures were being followed and to answer any questions the participants might have had. After we collected all data, 2 participants were removed from the data sample. One because of low compliance rate (< 33%) as we followed the guidance by Palmier-Claus

et al. (2011) and second because of malfunctioning mobile device which stopped working after 2.5 days.

Statistical Analyses

Descriptive analyses of the time-invariant data were performed in SPSS 23, and the ESM data were analyzed in STATA/MP 13.0. We used the chi-square analysis to test for interaction between gender and partner status and independent sample *t*-test to measure gender differences in age.

The ESM data have a hierarchical structure where repeated momentary observations (level 1) are nested within participants (level 2). First, we computed the mean of the NA items for each moment (average of 4-items representing NA) per participant, and a similar procedure was done for the PA and stress items. We then performed a multilevel linear regression to examine the association between level 1 NA and level 2 attachment-related anxiety and avoidance by entering the composite NA score as the dependent variable and the level of attachment-related anxiety and attachment avoidance as two predictors. We then repeated the same multilevel linear regression with PA as a dependent variable, and another with stress as the dependent variable.

To examine if attachment-related anxiety and avoidance is associated with perceived closeness of the company we performed multilevel regression with closeness as the outcome and attachment-related anxiety and avoidance as two predictors. In this case we controlled for the specific type of company (e.g., parent, partner, strangers, etc.).

To examine the interaction between closeness of the company and attachment dimensions as predictors of PA, NA, and stress, we performed the multilevel regression with PA/NA/stress as the outcome, and level of closeness of the current company x attachment-re-

lated anxiety as interacting predictors. We then repeated these regressions with attachment-related avoidance as the interaction term. Level 1 predictors were centered within cluster (participants) and level 2 predictors were grand mean centered to establish a meaningful zero point and to remove between-cluster variation from the predictors. Since it is assumed that the observations within participants co-vary over time, we used the variance-covariance structure as unstructured with the estimation method. The intercepts and slopes were treated as random as we expected individual variability within participants.

Results

Attachment and Momentary Mental States in Daily Life

The multilevel linear regression analyses revealed a significant positive association between the level of attachment-related anxiety and NA ($\beta = 0.261$, $SE = 0.108$, $p = .016$, 95% CI [0.049, 0.473]) as well as higher momentary stress levels ($\beta = 0.297$, $SE = 0.118$, $p = .012$, 95% CI [0.066, 0.528]), in that participants with higher attachment-related anxiety endorsed higher levels of NA and stress in their daily lives. No relationship between attach-

ment-related anxiety and PA was observed ($\beta = -0.035$, $SE = 0.088$, $p = .691$, 95% CI [-0.207, 0.137]).

Contrastingly, there was no relationship between attachment-related avoidance and NA ($\beta = 0.119$, $SE = 0.112$, $p = .289$, 95% CI [-0.101, 0.338]), or stress ($\beta = 0.161$, $SE = 0.098$, $p = .102$, 95% CI [-0.032, 0.353]), but a significant negative association emerged between attachment-related avoidance and PA ($\beta = -0.236$, $SE = 0.107$, $p = .027$, 95% CI [-0.446, -0.026]). That is, participants with higher attachment-related avoidance tended to experience lower PA in daily life.

Attachment and Perceived Closeness of the Company in Daily Life

Using the multilevel linear regression, we did not detect an association between attachment-related anxiety and perceived closeness of the company, regardless of the type of company one was in ($\beta = 0.133$, $SE = 0.096$, $p = .163$, 95% CI [-0.054, 0.322]). A different pattern emerged for attachment-related avoidance, however, with higher levels of avoidance being associated with lower perceived closeness of the company ($\beta = -0.276$, $SE = 0.070$, $p < .001$, 95% CI [-0.413, -0.139]). Participants with higher attachment-related avoidance

Table 1 Mean scores and standard deviations on attachment style and experience sampling measures

	<i>M</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>
Anxiety (ECR-R)	3.27	1.03	1.22	6.11
Avoidance (ECR-R)	3.33	1.01	1.78	5.61
Positive affect (ESM)	4.99	1.17	1.00	7.00
Negative affect (ESM)	2.22	1.06	1.00	7.00
Stress (ESM)	2.62	1.22	1.00	7.00
Closeness of the company (ESM)	5.78	1.58	1.00	7.00

Note. *M* = Mean, *SD* = Standard deviation, ECR-R = Experience in Close Relationships questionnaire

tended to experience less closeness to others regardless of them being with their partner, family member, friend, or a stranger.

Moderation Analysis

Attachment-related anxiety did not moderate the effect of closeness of the company on NA,

PA or stress (all *p*-values > .05), while attachment-related avoidance moderated the effect of closeness of the company on NA ($\beta = 0.045$, $SE = 0.019$, $p = .016$, 95% CI [0.008, 0.082]), indicating in that those with higher attachment-related avoidance, increasing closeness is associated with higher NA than in those with lower avoidance (Figure 1).

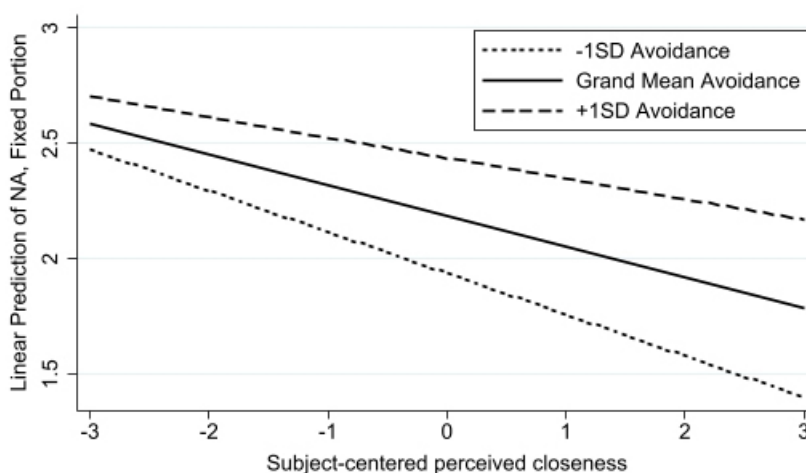


Figure 1 Moderation effect of attachment avoidance on association between closeness and negative affect.

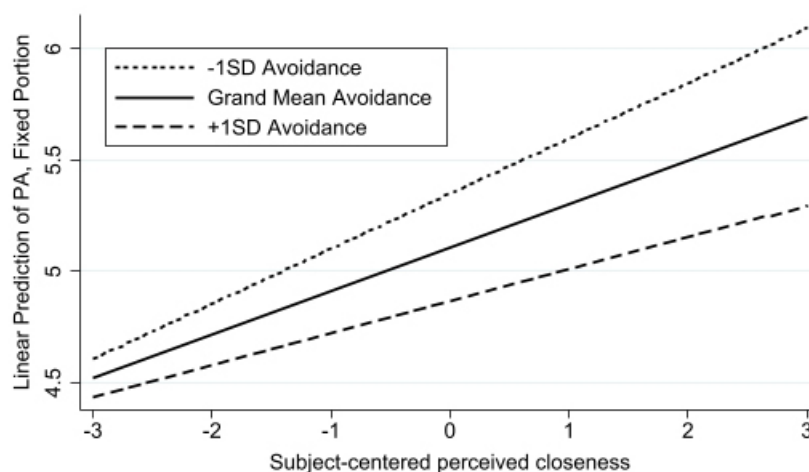


Figure 2 Moderation effect of attachment avoidance on association between social closeness and positive affect.

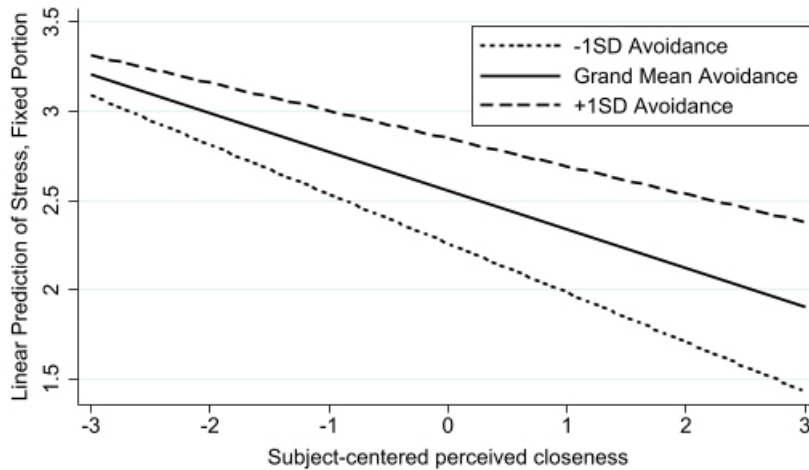


Figure 3 Moderation effect of attachment avoidance on association between social closeness and momentary stress.

Similarly, attachment-related avoidance also moderated the association between social closeness and PA ($\beta = -0.052$, $SE = 0.022$, $p = .019$, 95% CI [-0.096, -0.009]) in that with increased attachment avoidance the closeness of the company tended to decrease its positive association with PA (Figure 2).

Moreover, attachment-related avoidance also moderated the association between social closeness and momentary stress level ($\beta = 0.060$, $SE = 0.024$, $p = .012$, 95% CI [0.013, 0.107]), indicating that with higher attachment-related avoidance, the negative association between closeness of the company and momentary stress was decreasing (Figure 3).

Discussion

The present study explored the links between attachment-related anxiety and avoidance and momentary mental states as well as social experiences of healthy adults, in the flow of their daily lives. As we hypothesized, we found that participants' momentary affective states, stress and perception of closeness

varied in meaningful ways as the function of attachment-related anxiety and avoidance. The results support the idea that attachment dimensions are relevant features of personality, which affect a broad range of experiences and are not connected only to social interactions or close relationships (Sheinbaum et al., 2015; Torquati & Raffaelli, 2004). Overall, participants with increased attachment-related anxiety reported higher scores of momentary negative affect and stress in daily life. Participants with increased attachment-related avoidance reported lower scores of positive affect and perceived the company within social interactions globally as less close to them, regardless if the company was their partner, relative, friend or a stranger. Moreover, the attachment-related avoidance moderated the association between perceived proximity to the company and momentary mental states. The increased attachment-related avoidance led to a more negative experience (increased negative affect and stress; decreased positive affect) when interacting with others, thus pointing towards possible lower supportive

effect of proximity to others compared to individuals with lower attachment-related avoidance.

Our findings align with a wealth of cross-sectional attachment research showing that social anhedonia – diminished ability to derive pleasure, reward and positive emotions from social interactions – may be an emotional coping strategy of the attachment system to avoid close relationships that may be distressing (Brown et al., 2007; MacDonald et al., 2013; Mikulincer & Shaver, 2003; Troisi et al., 2010). The resulting behavior of keeping distance from others could then be manifested as attachment-related avoidance (Shaver & Mikulincer, 2002). Our findings of diminished positive emotions and perception of closeness with others, as well as decreased supportive effect of such closeness on the affective state in those with higher attachment-related avoidance provide a direct support of this framework. Importantly, our findings also add a crucial ecological validity to the attachment theory, with important clinical and public health implications (Mikulincer & Shaver, 2012). Indeed, diminished pleasure from and drive towards social interactions and bonds often leads to impaired social and occupational functioning or social withdrawal, which in turn may constitute a risk factor for the development of psychopathology (Collins & Feeney, 2004; Mikulincer & Shaver, 2012; Watson & Naragon-Gainey, 2010).

Moreover, our findings, showing that diminished experience of closeness and increased negative affective reactivity to it is less pronounced in case of attachment-related anxiety, are aligned with the hyperactivation aspect of the attachment-triggered behavior that postulates that attachment-related anxiety is manifested by approach behavior, particularly in distressing situations (Shaver & Mikulincer 2002), or ambivalence toward

others (MacDonald et al., 2013; Mikulincer et al., 2010). On the other hand, our results confirmed the findings that attachment-related anxiety is associated with focus on distress, distrust, threat and rumination on negative thoughts (Feeney, 2016; Mikulincer & Shaver, 2003; Sheinbaum et al., 2015). This tendency is supported by our results showing an overall increased negative affect and daily stress in those with increased attachment-related anxiety. Critically, those with attachment-related anxiety have been shown to rely on emotion-focused coping strategies to a greater extent compared to individuals with secure or avoidant attachment (Wei et al., 2005), revealing a potential for emotion-focused therapy being particularly effective for these individuals (see e.g., Watson, 2018). Furthermore, the fact that we detected these affective, social and behavioral patterns in daily life indicates that ecological momentary interventions (Gründahl et al., 2020; Schueller et al., 2017), which target maladaptive withdrawal behavior and train coping skills in moments of need throughout everyday life, could constitute an untapped therapeutic potential in insecurely attached individuals.

Early identification of increased attachment-related anxiety and/or avoidance could lead to timely intervention focused on emotions and social interactions and possible prevention of creating rigid maladaptive patterns of perception and behavior. Identifying contextual variables in daily life could illuminate the specific needs of individuals and create personalized approaches within therapy. To find out more about the fast emerging topic of using personal mobile technologies within mental healthcare (see e.g., Ben-Zeev et al., 2015; Heron & Smyth, 2010; Loo Gee et al., 2016; Myin-Germeys et al., 2016; Vaessen et al., 2019).

However, our findings ought to be interpreted in light of several limitations. The

cross-sectional design of this study allows to explore two attachment dimensions and their putative affective and behavioral correlates in daily life, with no causal inferences. Moreover, we employed convenience sampling to recruit participants, so the sample may not be fully representative of the distribution of attachment-related anxiety and avoidance and full diversity of daily experiences in the general population. According to the authors Kirtley et al. (2019), who provided an approximate indication that for obtaining medium and large effects using one predictor and similar ESM study design (6-days and 10-assessment per day protocol), the sample size should be at least 40 participants to achieve the power of 80%. Thereby, our results could have been influenced with smaller power of a test due our sample size. Further, all assessments in the present study are of self-reported, subjective nature, with no physiological or behavioral parameters to corroborate, for instance, reported stress levels. While we acknowledge the importance of physiological arousal as an important indicator of in-the-moment coping (Smets et al., 2018), as well as a predictor of the development of stress-related psychopathology (Azza et al., 2019), we argue that affective reactivity to environmental triggers (Myin-Germeys & van Os, 2007) and self-reported social behavior (Snippe et al., 2018) are an accurate metric of psychosocial functioning and distress (Booij et al., 2018; Myin-Germeys et al., 2003; Myin-Germeys et al., 2001). It would be valuable, however, if future studies of attachment-related behavior and affect dynamics in daily life could corroborate our findings with a combination of both subjective and objective assessments.

In conclusion, the assessment of individual attachment dimensions in combination with momentary assessments of its daily-life correlates could detect meaningful patterns of

a negative experience, withdrawal or social anhedonia that could lead to targeted just-in-time interventions. Despite the long research tradition in the attachment field, the research of adult attachment in the real-world conditions is still emerging. Our aim was to provide initial evidence that ESM research of adult attachment is a promising, albeit still underdeveloped, field for further inquiry. The current study supports and extends the validity of dimensional approach to attachment to the scope of daily life and points out that attachment-related anxiety and avoidance lead to different experiences.

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