**Negative expectations regarding interpersonal interactions in daily life are associated with
subclinical depressive symptoms in a student sample: A prospective experience sampling
study**

Thies Lüdtke¹ and Stefan Westermann²

¹ Department of Human Medicine, MSH Medical School Hamburg, Hamburg, Germany

² Department of Psychology, MSH Medical School Hamburg, Hamburg, Germany

Suggested running head: INTERPERSONAL EXPECTATIONS IN DAILY LIFE ARE
RELATED TO SUBCLINICAL DEPRESSION

Author Note

Thies Lüdtke <https://orcid.org/0000-0003-2019-3842>

Stefan Westermann <https://orcid.org/0000-0002-4785-0024>

Correspondence concerning this article should be addressed to Thies Lüdtke, e-mail:
thies.luedtke@medicalschooll-hamburg.de,

Abstract

Background. Dysfunctional expectations and interpersonal problems are central aspects of depression, but expectations regarding everyday-life interpersonal interactions have not been studied, yet. Using Experience Sampling, we measured expected emotions towards interaction partners and compared them with actual emotions. We hypothesized that stable negative expectations would predict sub-clinical depression and negative affect.

Methods. Fifty-three students completed six days of Experience Sampling, consisting of one morning assessment on expectations regarding anticipated interpersonal interactions (9am), three assessments on actual interpersonal experiences (1pm, 5pm, 9pm), and six pseudo-random affect assessments. We compared expected emotions, experienced emotions, and day-to-day fluctuations of expectations between individuals with high versus low sub-clinical depression (median split). Using mixed models, we examined whether negative expectations preceded negative affect, and whether expectation violations preceded adjustments of expectations.

Results. Individuals with higher depression expected more negative emotions, even after controlling for negative experiences, and surprisingly more variable expectations. In mixed models, neither momentary expectations nor experiences preceded negative affect, but worse-than-expected interpersonal interactions did. Better-than-expected interactions predicted reductions of negative expectations, but less so in the high-depression group.

Conclusions. Our findings are limited by the non-clinical sample and skewed data. Nonetheless, our approach appears well-suited to examine idiosyncratic interpersonal expectations in vivo.

Keywords: ViolEx model, expectation violation, experience sampling method (ESM), ecological momentary assessment (EMA)

Introduction

Negative views of the future are a central aspect of Major Depressive Disorder (MDD). For example, the influential cognitive triad of depression acknowledges negative cognitions directed towards the future, the world, and the self as key aspect of depressive disorders (Beck et al., 1974). Further, the hopelessness theory of depression (Abramson et al., 1989) posits that adverse childhood experiences can facilitate the development of negative inferential styles, which in turn lead to hopelessness and finally to depression when an individual is confronted with negative life events (for a review, see Liu et al., 2015). According to Abramson and colleagues (1989), the content domain of a person's inferential styles functions as a vulnerability when a person is confronted with stressors in that same domain, meaning that a person who shows elevated sensitivity for interpersonal events might develop symptoms when confronted with social rejection (for a review of the various altered interpersonal processes in depression, see Hames et al., 2013). In accordance with the hopelessness theory, one of the core criteria of MDD is the presence of "depressed, sad, hopeless (...)" mood (American Psychiatric Association, 2013, p. 163).

Recently, negative cognitions about the future have received renewed attention in the "ViolEx" model (Rief et al., 2015; Rief and Joormann, 2019). As the name suggests (ViolEx is short for violation of expectations), the model focuses on a specific subtype of negative cognitions, namely expectations, which can be described as future-directed cognitions that refer to the likelihood of a specific event or experience to occur (Kube et al., 2020a). The model proposes that situation-specific negative expectations about future events are at the core of the formation and maintenance of mental disorders, such as depression (Rief et al., 2015; Rief and Joormann, 2019). As indicated by the term "situation-specific", the work by Rief, Kube and colleagues focuses on expectations regarding specific real-world

situations rather than generalized hopelessness or pessimism, which they nonetheless acknowledge as important underlying processes (Kube et al., 2020a). Empirical studies support the notion that situation-specific negative expectations about future events are predictive of depressive symptoms in cross-sectional and longitudinal observational designs (Kube et al., 2018a; Kube et al., 2018c).

At the core of the ViolEx model are so-called “expectation violations”, meaning the mismatch of expectations and actual experiences (Rief and Joormann, 2019). Specifically, the model ascribes importance to the way these expectation violations are processed (Kube et al., 2020a). Whereas healthy participants adaptively change a negative expectation in response to a disconfirmed expectation, the model suggests that people with depression (or other disorders) fail to update negative expectations about the future, contributing to the maintenance of symptoms. The ViolEx model complements established theories well, as indicated by findings that situation-specific dysfunctional expectations mediate the effect of “intermediate beliefs” (Beck, 2011, p. 189) on depressive symptoms (Kube et al., 2018a).

Situation-specific expectations have been studied in different contexts, such as expectations about one’s performance in a task (Kube et al., 2019b), the ability to regulate emotions (Kube et al., 2017), or the intensity and controllability of intrusions (Herzog et al., 2022). Expectations that received very limited empirical attention so far (D’Astolfo et al., 2020) are situation-specific expectations about interpersonal interactions. This paucity is surprising given that interpersonal expectations are an important aspect of the ViolEx model, as indicated by the fact that two of four subscales of the Depressive Expectations Scale capture expectations about social interactions (Kube et al., 2017). In fact, depression and interpersonal interactions are closely intertwined. In comparison with non-depressed controls, people with MDD show altered facial expression, eye contact, and nonverbal gestures (Hames et al., 2013). They tend to alternate between excessive reassurance seeking to achieve self-enhancement

(Starr and Davila, 2008) and negative feedback seeking aiming at self-verification (Hames et al., 2013; Wakeling et al., 2020). Further, depressed individuals show social anhedonia (Atherton et al., 2015), increased sensitivity to social rejection (Gao et al., 2017), and increased negative affect in response to momentary social stressors (van Winkel et al., 2015). Given these interconnections between depression and interpersonal processes, the present paper aims at examining the ViolEx model's predictions in the context of interpersonal interactions.

Applying the ViolEx model to interpersonal interactions could be fruitful but it is a difficult endeavor. First and foremost, assessments of expectations evidently need to be *prospective*, meaning that longitudinal designs of some sort are necessary to measure expectations regarding a situation before the situation occurs (e.g., longitudinal experimental designs; Kube et al., 2018b). Beyond this general caveat, interpersonal interactions are idiosyncratic, meaning that they are best understood in a person's social context due to inter-individual differences concerning the number and quality of interactions (Wilson et al., 2015) as well as interaction partners who might trigger certain interpersonal behavior (Meehan et al., 2018). Given these challenges, the assessment of interpersonal expectations warrants a method with high ecological validity, such as the Experience Sampling Method (Myin-Germeys et al., 2018; Myin-Germeys et al., 2009). ESM studies use diary-like self-reports to capture momentary feelings, symptoms, and other variables of interest repeatedly throughout the day in participants' everyday lives. This method can be used to capture prospective expectation regarding anticipated meetings with actual real-world interaction partners (i.e., before the meeting takes place), while being unaffected by depressive recall biases (Ben-Zeev and Young, 2010; Urban et al., 2018). Further, ESM allows examining the stability of these expectations over time as well as their accuracy by comparing them with actual interpersonal experiences (i.e., expectation violations).

To the best of our knowledge, no study has examined situation-specific interpersonal expectations in a prospective ESM design as of yet, but the overarching idea is not new. In fact, several studies have used such designs to examine expectations regarding mood and pleasure in everyday life (Li et al., 2019; Thompson et al., 2017; Wu et al., 2017; Zetsche et al., 2019). In the present study, we draw on this “affective forecasting” research (Mathersul and Ruscio, 2019) inasmuch as we operationalized interpersonal expectations as *expected negative emotions* towards an interaction partner. Although this approach comes at the cost of disregarding other potential facets of interpersonal expectations, such as expectations regarding fairness of interaction partners [43] or social rejection [7], it has the advantage of yielding an index that is inter-individually comparable despite the idiosyncrasies of interpersonal interactions, which is well established in ESM research on interpersonal interactions (Liu et al., 2018).

The overarching goal of the present study was to examine whether the extent to which people expect to experience negative emotions in an anticipated interpersonal interaction is associated with depressive symptoms in a sub-clinical population. We addressed this research question in several ways. First, we examined whether overall negative interpersonal expectations (averaged across a six-day ESM period) as well as the day-to-day variability of negative expectations were associated with subclinical depressive symptoms. Second, we wanted to learn about the immediate effects of negative interpersonal expectations as well as experiences on current mood (i.e., does thinking about an unpleasant meeting result in feelings of sadness, anger, distress, etc. shortly after?), so we used the ESM-derived intensive repeated measures data to examine the moment-to-moment effects of negative interpersonal expectations as well as negative experiences (i.e., actual negative emotions experienced during an interpersonal interaction) on subsequent negative affective states during the same day. Lastly, we examined whether violations of expectations (i.e., discrepancies between expected and experienced negative emotions) were associated with negative affect, whether they predict adjustments of

134 expectations in following interactions, and whether negative expectations were “immune” to expectation
135 violations in people with elevated subclinical depressive symptoms.
136

137 **Methods**

138 **Recruitment**

139 We recruited undergraduate psychology students who took part in the study for course credits.
140 Participants were eligible if they were at least 18 years of age and reported no mental disorder. The ethics
141 committee of the Faculty of Human Sciences at the University of Bern approved the study (#2016-05-
142 00006).

143 **Procedures**

144 Assessments took place between August and November 2016. Initial analyses of the dataset
145 focused on motivational incongruence using a network approach whereas data on interpersonal
146 expectations were not analyzed as of yet. In the light of recent theoretical (Rief and Joormann, 2019) and
147 empirical advances in the field (e.g., Zetsche et al., 2019), we decided to revisit the data. Figure 1 shows
148 the study design.

1. Consent		Participants gave written informed consent, provided an e-mail address to receive the invitation for the baseline online assessment, and received the ESM study smartphone
2. Baseline		Self-report online assessment of sociodemographics, the Depression Anxiety Stress Scales (DASS), and other self-report scales that were not relevant for the present analyses
3. ESM		Six days of ESM assessments (10 assessments per day): <ul style="list-style-type: none"> - one prospective ESM assessment on expected emotions regarding up to three interpersonal interactions, - three retrospective ESM assessments on actual emotions during interactions - 6 pseudo-random assessments of momentary affect
4. Debriefing		After completing the ESM phase, participants returned the study smartphones and completed an unstructured assessment of technical difficulties as well as burden caused by ESM assessments

Figure 1. Study flow.

All participants provided written informed consent before the start of the study. The baseline assessment consisted of an array of online questionnaires as well as a face-to-face meeting, in which participants received a study smartphone and detailed instructions on how to use it. The ESM assessment

phase began after the baseline assessment (days between baseline and ESM: $M = 5.7$, $SD = 5.4$) and was scheduled to last 6 days. We disabled all functions of the study smartphones except for the ESM program ‘movisensXS’, version 0.8.4211 (movisens GmbH, Germany). There were 10 ESM assessments per day. Four assessments occurred at fixed times, namely at 9 a.m. (prospective assessment), as well as 1 p.m., 5 p.m., and 9 p.m. (retrospective assessments). Six additional assessments of momentary negative affect occurred at pseudo-random times between 9:30 a.m. and 9:30 p.m. with a minimum distance of 60 minutes in between.

Measures

Baseline measures

Participants completed an extensive baseline assessment of self-report questionnaires. For the sake of brevity, we will focus on measures that are relevant for the analyses presented here. We administered the German version (Nilges and Essau, 2015) of the Depression Anxiety Stress Scales (DASS-21). For psychometric properties of the English scales see Antony et al. (1998). On three subscales, the DASS-21 measures depression, anxiety and stress. Participants rated how much each statement applied to them over the past week. Response options ranged from 1 (“Did not apply to me at all”) to 4 (“Applied to me very much, or most of the time”). For the German version, internal consistencies of the subscales range from $\alpha = 0.78$ for the stress subscale to $\alpha = .91$ for the depression subscale. In our sample, similar values were achieved, with the highest value for the depression subscale ($\alpha = .87$), which we used in the analyses, followed by the stress- ($\alpha = .80$) and the anxiety subscales ($\alpha = .79$). The DASS-21 is designed to capture symptoms both in clinical and non-clinical samples (Antony et al., 1998), making it a suitable choice for our non-clinical student sample.

Prospective ESM assessment

At 9 a.m. each morning, participants completed the prospective ESM assessment. First, we asked whether an interpersonal interaction was scheduled/anticipated for the morning (9 a.m. to 1 p.m.), noon (1p.m. to 5 p.m.), or afternoon/evening (5 p.m. to 9 p.m.) of the same day. If the participant responded with “yes”, we asked them to report the gender of the person, their relationship with them (partner, colleague, fellow student, etc.), and who initiated the meeting. If they planned to interact with several persons during a specific timeframe, participants were instructed to choose the person that was most important to them. If there was no anticipated interaction, participants could skip the respective section of the prospective assessment. We used participants’ ratings of how they expected to feel towards their interaction partner (“How will you feel towards your interaction partner?”) to measure interpersonal expectations. Participants rated each of the following emotional states: sad, angry, ashamed, happy, proud, content, scared, contemptuous, and guilty. Ratings were provided on 7-point Likert-scales ranging from “not at all” to “very” (e.g., “not angry at all” to “very angry”). We calculated the scale “negative interpersonal expectations” as the mean score of the items “sad”, “angry”, “ashamed”, “scared”, and “guilty”.

Retrospective ESM assessments

Three retrospective ESM assessments were scheduled at 1 p.m., 5 p.m., and 9 p.m. Participants reported whether the expected interaction took place and whether it was terminated prematurely. If the interaction took place, participants rated how they actually felt during the interaction, using the same aforementioned items (i.e., “sad”, “angry”, “ashamed”, “scared”, and “guilty”), resulting in a score of the actual negativity of the interpersonal experience. If an interaction was cancelled, we asked participants to guess how they would have felt during the interaction but these ratings were not considered in the present study.

Expectation violations (combination of prospective and retrospective ESM assessments)

Expectation violations were operationalized as the difference between a retrospective (i.e., experience-based) and a prospective (i.e., expectation-based) rating of negative emotions for a specific interpersonal interaction (expectation violation_{interaction i} = negative experience_{interaction i} – negative expectation_{interaction i}). Hence, a positive value indicates that the actually experienced negative emotions were stronger than anticipated, so the interaction was “worse than expected”. For certain analyses, we considered only better-than-expected expectation violations (see Table 4), which we recoded so that higher values represent stronger positive expectation violations.

Pseudo-random ESM assessments of affect

At pseudo-random times between 9:30 a.m. and 9:30 p.m., participants reported positive and negative emotional states using a short version of the Positive and Negative Affect Schedule (PANAS; Watson et al., 1988) called PANAVA-KS (Schallberger, 2005). The 10-item scale was developed for ESM research specifically and it covers positive activation (four items), negative activation (four items), as well as valence (two items) on 7-point Likert scales ranging from a positive to a negative pole (e.g., from relaxed to distressed). For the present analyses, we computed momentary negative affect as the mean score of the following items: distress (relaxed to distressed), anger (peaceful to angry), sadness (sad to happy), worry (free from worry to worried), and dissatisfaction (satisfied to dissatisfied). Higher ratings either reflect less positive or more negative affect, but we will refer to “negative affect” throughout to simplify the terminology.

Internal consistency of ESM measures

The nested structure of ESM assessments clustered within participants requires a reliability measure which takes the dependency of assessments into account (Bonito et al., 2012; Nezlek, 2017), so we relied on a multilevel procedure proposed by Bolger and Laurenceau (2013, pp. 127-138). Using the VARCOMP command in SPSS version 27 (IBM SPSS Statistics, RRID:SCR_016479), we obtained the

time*person variance as well as the error variance to assesses the reliability of within-subject change over time, indicating whether there is “adequate systematic time x person variance” in a dataset (Bolger and Laurenceau, 2013, p. 137). In addition to the multilevel reliability, we report the classical Cronbach’s α , using data from the first assessment per participant.

Multilevel reliability scores were .70 for the negative expectations scale, .69 for the negative experiences scale, and .79 for the negative affect scale. The cross-sectional Cronbach’s α values were $\alpha = .83$ for the negative expectations scale, $\alpha = .65$ for the negative experiences scale, and $\alpha = .73$ for the negative affect scale.

Data preparation

We provided the option to access ESM questionnaires manually so that participants could catch up on prompted assessments that were missed. For some participants, this resulted in multiple entries for the same assessment (e.g., two retrospective emotion ratings for the same interpersonal interaction). If there was more than one fully and timely completed rating, we retained the later rating as the participant likely corrected their initial response (this applied to 27 out of 3982 cases, corresponding to 0.7%).

The first goal of the study was to compare aggregated scores of negative interpersonal expectations, negative interpersonal experiences, expectation variability, and expectation violations (i.e., one index per participant) between people with high vs. low subclinical depressive symptoms. We aggregated negative expectations and negative experiences by computing the person-mean of ratings across the 6-day assessment period, whereas the variability of negative interpersonal expectations was operationalized as the person-*SD* across the six days. To obtain an aggregated value of expectation violations, we computed the difference between each interpersonal expectation and the corresponding interpersonal experience and

computed the person-mean. This value indicates whether participants showed a general “bias” towards too optimistic vs. pessimistic expectations across interpersonal interactions.

Analyses

Group comparisons of aggregated ESM data

All group comparisons relied on a median split of subclinical depressive symptoms based on DASS-21 scores, which resulted in $n = 29$ participants with low, and $n = 24$ with high depressive symptoms. Baseline characteristics are presented in Table 1. We conducted independent samples t -tests with two-sided significance tests and conventional p -values of .05. In case of non-normality, we also report results from Mann-Whitney-U tests as well as bias corrected and accelerated (BCa) bootstrap confidence intervals (5000 samples). Given that negative interpersonal expectations are correlated with actual negative experiences (i.e., a person who had many aversive interpersonal experiences will likely be pessimistic about future interpersonal encounters), we followed up on the t -tests with an ANCOVA to examine whether the group difference in negative interpersonal expectations would remain significant after controlling for negative interpersonal experiences.

Precursors of moment-to-moment fluctuations of negative affect

In addition to aforementioned group comparisons, which make only limited use of the intensive longitudinal ESM data, we conducted lagged regression mixed model analyses (LMM), which allow examining the moment-to-moment fluctuations of variables and their precursors. LMM account for the clustering of occasions nested within participants, which is defining for ESM and other longitudinal research designs, while also flexibly handling missing data (Twisk, 2019, p. 150). All models included random intercepts but no random slopes. If we were interested in group differences of multilevel effects,

we included group as a predictor at the person-level and added the predictor*group interaction to identify differences between people with low vs. high subclinical depressive symptoms.

LMM effects are comprised of two components, namely a within-person effect and a between-person effect. We were interested primarily in the within-person effect as it represents the moment-to-moment fluctuations of predictor variables within persons. Therefore, we person-mean centered predictor variables by computing the within-person mean of the predictor variable (e.g., negative expectations) and subtracting each value from it. Expectation violations were not centered as they were calculated as within-person difference scores, which do not require centering. If there was no within-person effect of moment-to-moment fluctuations, we followed up on the analyses with so-called “hybrid models” (Twisk, 2019, p. 139), which include both the person-mean centered predictor as well as the person-mean itself, allowing to disentangle within- from between-person effects. We conducted separate LMM to explore the effect of negative interpersonal expectations, negative experiences, and expectation violations on subsequent negative affect.

Precursors of expectation adjustments

The ViolEx model predicts that people with depression retain dysfunctional negative expectations despite experiencing disconfirming positive expectation violations. To test this assumption, we identified participants who interacted with the same interaction partner repeatedly during the ESM period (using nicknames that participants provided for their interaction partners) and examined the effect of expectation violations on subsequent changes of negative expectations ($\text{expectation adjustment}_{\text{person } i, t0} = \text{negative experience}_{\text{person } i, t0} - \text{negative experience}_{\text{person } i, t-1}$). Subsequently, we compared the effect between people with high versus low subclinical depressive symptoms using an interaction term.

Results

Participant characteristics and adherence

A total of $N = 55$ participants completed the baseline assessment. We had to exclude two participants because they completed less than 33% of the scheduled ESM assessments, so the final sample consisted of $n = 53$ participants. Baseline characteristics are presented in Table 1. The proportion of female participants was higher in the low depression subgroup.

Table 1

Baseline characteristics for the entire sample and per group ($n = 53$)

Baseline characteristic	Overall ($n = 53$)	Low depression ($n = 29$)	High depression ($n = 24$)	Statistic (df), p
Age; M (SD)	21.8 (2.1)	21.6 (2.0)	21.9 (2.3)	$t(51) = 0.507, p = .615$
Gender; female/male	46/7	28/1	18/6	$\chi^2(1) = 5.231, p = .038$
Education years; M (SD)	14.3 (1.8)	14.3 (1.5)	14.3 (2.1)	$t(51) = 0.108, p = .914$
DASS-21-D; M (SD)	1.6 (0.6)	1.2 (0.1)	2.1 (0.6)	$t(25) = 7.584, p < .001$

Notes. DASS-21-D = DASS-21 depression subscale; In case of unequal variances (significant Levene's test), we report corrected degrees of freedom and associated p -values based on the Satterthwaite approximation provided by SPSS 27.

The majority of included participants ($n = 51$; 96%) used the study smartphone for 6 days as intended. One participant turned off the smartphone prematurely after 4 days, and another participant kept it on for 7 days, resulting in a grand mean of 5.98 days of usage ($SD = 0.30$).

Assessments were flagged as missing if they were dismissed, ignored, discontinued, or completed more than 30 minutes late. The proportion of missing or late assessments was 20.4% for the fixed prospective/retrospective assessments and 17.1% for pseudo-random assessments of affect, resulting in 18.3% missing assessments overall.

Group comparisons of aggregated ESM data

Results of independent samples *t*-tests comparing people with high vs. low subclinical depressive symptoms are presented in Table 2. People who scored higher showed, on average, stronger negative interpersonal expectations during the 6-day ESM period (supported by a non-parametric Mann-Whitney-U-test; $z = 3.847$, $p < .001$), but they also reported stronger negative experiences in terms of retrospective negative emotions (Mann-Whitney-U-test: $z = 2.762$, $p = .006$). An ANCOVA indicated that the group difference of negative expectations remained significant when controlling for negative experiences (adjusted non-standardized group difference: $b = -0.108$, $SE = 0.042$, $t = 2.557$, $p = .014$, Bootstrap-CI $[-0.204; -0.20]$, $\eta^2 = .116$), suggesting that the group difference of negative expectations is not merely a by-product of negative interpersonal experiences. Contrary to our hypothesis, the variability of negative expectations was larger (rather than smaller) in people with higher depressive symptoms – possibly due to the fact that people with low depressive symptoms expected hardly any negative emotions during anticipated interpersonal interactions, resulting very little variance. Lastly, we compared expectation violations, meaning the accuracy of participants' interpersonal expectations, between groups (i.e., the consistency of expected and experienced negative emotions). With values close to zero, both groups' 6-day-averaged interpersonal expectations were very accurate, resulting in a non-significant difference.

Due to the unexpected group difference in the proportion of female participants (see Table 1), we decided to repeat the group comparisons presented in Table 2 with gender as a covariate. Adding gender as a covariate did not change the direction or significance of effects.

Table 2.

ESM-derived person-means of expectations, experiences, expectation-variation, and expectation violations between people with low ($n = 29$) vs. high ($n = 24$) depressive symptoms

Outcome	Low depressive symptoms, M (SD)	High depressive symptoms, M (SD)	t (df)	p	Bootstrap-CI	g
Negative expectations	1.095 (0.15)	1.376 (0.34)	3.81 (30.2)	<.001	[-0.43; -0.14]	1.11
Negative experiences	1.094 (0.19)	1.294 (0.36)	2.38 (32.3)	.023	[-0.37; -0.04]	0.70
Expectation variability	0.138 (0.19)	0.313 (0.26)	2.85 (51.0)	.006	[-0.30; -0.05]	0.78
Expectation violations	0.003 (0.07)	-0.034 (0.23)	0.76 (27.0)	.457	[-0.58; 0.13]	0.22

Notes. In case of unequal variances (significant Levene's test), we report corrected degrees of freedom and associated p -values based on the Satterthwaite approximation provided by SPSS 27; Bootstrap-CI = Bootstrap Confidence Intervals based on 5000 samples, g = Hedges' g .

Negative interpersonal expectations as precursors of negative affect

Within-person fluctuations of negative expectations did not predict negative affect during subsequent hours of the day (see Table 3), which was supported by a hybrid model, indicating that person-mean values of negative expectations were associated with momentary negative affect ($b = 1.507$, $SE = 0.371$, $t(df) = 4.064$ (56.29), $p < .001$) whereas momentary fluctuations of negative expectations were not ($b = 0.044$, $SE = 0.077$, $t(df) = 0.570$ (1595.72), $p = .569$). This pattern of results suggests that it is not the ebb and flow of expectations which predicts fluctuations of negative affect, but instead a person's "general" negativity of expectations.

Negative interpersonal experiences as precursors of negative affect

The effects of negative experiences on negative affect were similar to those of negative expectations (see Table 3). Whereas moment-to-moment fluctuations of negative experiences did not predict subsequent negative affect in the hybrid model ($b = 0.190$, $SE = 0.119$, $t(df) = 1.599$ (330.55), $p = .111$), the tendency to report stronger negative interpersonal experiences on average did predict negative affect ($b = 1.379$, $SE = 0.325$, $t(df) = 4.241$ (51.12), $p < .001$).

Expectation violations as precursors of negative affect

The worse an interaction was when compared to a person's expectations, the more negative affect was reported in subsequent hours of the day (Table 3). Accordingly, a better-than-expected interaction resulted in less negative affect. We examined whether this effect differed between people with low versus high subclinical depressive symptoms because we assumed that

people with higher symptoms would show stronger increases of negative affect following worse-than-expected interactions. However, there was no interaction (see Table 3, model 4).

Table 3.

Precursors of negative affect in moment-to-moment lagged linear mixed model analyses

Precursor	<i>b</i>	<i>SE</i>	<i>t</i> (<i>df</i>)	<i>p</i>
Model 1: Neg. expectations	0.213	0.240	0.888 (227.02)	.375
Model 2: Neg. experiences	0.200	0.119	1.686 (331.69)	.093
Model 3: Expectation violations	0.252	0.106	2.367 (326.77)	.019
Model 4: Group x expectation violations	0.392	0.276	1.420 (327.57)	.156

Notes. All models include fixed intercepts (coefficients not displayed) and random intercepts.

Model 4 included main effects of expectation violations and group (coefficients not displayed).

In sum, the results presented in Table 3 indicate that it is not the negativity of a momentary interaction, but rather the *unexpected* negativity, which predicts subsequent negative affect – both in high versus low subclinical depressive symptoms.

Day-to-day adjustments of interpersonal expectations.

If a person's interpersonal expectation does not match the actual experience, this should lead to an adaptive adjustment of expectations in a subsequent interaction with the same interaction partner. Adaptation of expectations represents a central aspect of the ViolEx model, in that people with depression are hypothesized to show an insufficient adjustment of negative

expectations in light of correcting experiences, particularly of *positive* expectation violations (Kube et al., 2019b). Here, we examined whether better-than-expected expectation violations would predict the extent to which participants would adjust their negative expectation downwards when they interacted with the same person at least twice.

There were 154 interpersonal interactions with the same interaction partner provided by $n = 45$ participants (the median number of days between two interactions with the same partner was one). Unfortunately (both for the participants and our analysis), only a very small proportion of these cases were better-than-expected interactions, namely 24 interactions reported by $n = 17$ participants. The majority of same-partner expectations were accurate (125 accurate assessments; 88%). Despite this constraint, we conducted the analysis as planned.

As can be seen in Table 4, there was an association between the strength of the positive expectation violation and the amount of downward adjustment of negative expectations from one interaction to the next (model 1), and this effect was moderated by group (model 2). To visualize the nature of the moderation, we conducted a simple slope analysis. In line with the ViolEx model's predictions, simple slopes suggested a larger reduction of negative expectations in people with low depressive symptoms ($n = 16$ cases; $b_{low} = -1.300$, $SE = 0.185$, $t(df) = 7.025 (19.19)$, $p < .001$) compared to people with high depressive symptoms ($n = 8$ cases; $b_{high} = -0.657$, $SE = 0.224$, $t(df) = 2.937 (14.65)$, $p = .010$).

Table 4.*Precursors of the adjustment of expectations in repeated interactions*

Precursor	<i>b</i>	<i>SE</i>	<i>t</i> (<i>df</i>)	<i>p</i>
Model 1: Pos. expectation violation	-1.018	0.157	6.507 (22)	< .001
Model 2: Group x pos. expectation violation	0.642	0.290	2.212 (16.73)	.041

Notes. All models include fixed intercepts (coefficients not displayed in the Table) and random intercepts; model 2 included the main effects of group ($b = -0.474$, $SE = 0.189$, $t(19.27) = 2.506$, $p = .021$) and pos. expectation violation ($b = 1.300$, $SE = 0.185$, $t(19.19) = 7.025$, $p < .001$); the final Hessian matrix of model 1 was not positive definite due to a lack of variance of random intercepts.

Discussion

We examined whether negative expectations, their variability, and inaccuracy (i.e., degree of violation of expectation; Rief and Joormann, 2019) are associated with subclinical depressive symptoms as well as negative affective states in a non-clinical student sample. Whereas person-means of negative expectations across a 6-day ESM period were associated with subclinical depressive symptoms and negative affect, moment-to-moment fluctuations of negative expectations were not. Instead, *unexpected* expectation-violating negative experiences predicted subsequent increases of negative affect throughout the day. Effects of better-than-expected expectation violations on subsequent expectation adjustments (i.e., immunization; Kube et al., 2019b) must be interpreted with great caution due to the small number of

cases, but the data tentatively suggest that people with higher depression scores show rigid negative expectations that are insufficiently updated in light of positive interpersonal encounters.

The main results of our study are in line with the predictions of the ViolEx model (Kube et al., 2020b), but it remains unclear whether a generalization from our sub-clinical sample to clinical populations is warranted. Despite this caveat, our findings can be discussed in light of the existing literature. For example, people with clinically relevant depression report reduced hope, higher expectations of experiencing negative events and lower expectations for positive events (Thimm et al., 2013), and they overestimate the likelihood of negative mood in an ESM setting (Zetsche et al., 2019). Our findings add to this body of evidence in that we found that individuals with elevated depressive symptoms show stronger negative expectations in the interpersonal domain.

The study by Zetsche et al. (2019), and also other ESM studies on “mood forecasting” (e.g., Thompson et al., 2017) show that it is important to consider not only expectations regarding negative affect but also positive affect. In fact, a *lack of positive expectations* specifically – rather than the presence of negative expectations – appears to be associated with depression, for example in an observational longitudinal study of adolescents (Horwitz et al., 2017), in a meta-analysis of anticipatory pleasure for future experiences in depression (Hallford and Sharma, 2019), and in neuroscientific studies on blunted reward sensitivity in depression (Alloy et al., 2016). In future studies on interpersonal expectations, the differentiation into increased negative versus reduced positive expectations could be conceptualized in the framework of approach- and avoidance goals (Grosse Holtforth et al., 2007). In this framework, negative expectations either represent a tendency to avoid aversive interpersonal experiences (i.e., avoidance goals, such as being criticized) or a failure to achieve appetitive goals (i.e., an approach goal such as being admired).

The rigidity of negative expectations despite disconfirming positive expectation violations (explained through processes such as cognitive immunization; Kube et al., 2019b) is arguably one of the most important aspects of the ViolEx model, not least because it could be translated into targeted interventions (Kube et al., 2019a). Unfortunately, our data did not allow examining this aspect of the model in depth due to the small sample of individuals who interacted the same partner repeatedly and reported positive expectation violations. Nonetheless our preliminary findings are promising in that they suggest that individuals adjust negative expectations following positive expectation violations in the interpersonal setting, and that this tendency appears to be reduced in people with elevated depressive symptoms. It seems to be a worthwhile endeavor to pursue the integration of interpersonal expectation violations in depression further, for example complemented by processes that are well-established in neuroscience, such as a measure of confidence in one's predictions (for an integrative review, see Kube et al., 2020b). Confidence ratings could be of particular interest given that depression is linked to reduced specificity for positive future thinking (similar to autobiographic memories), whereas the specificity of negative and neutral thoughts about the future are not reduced (Gamble et al., 2019).

Limitations and future directions

Our results must be interpreted in light of several limitations. Beyond general peculiarities of healthy student samples (Henrich et al., 2010), recruiting non-clinical participants was problematic in our case because it led to extremely sparse ratings of negative experiences or symptoms. To illustrate, the mean ratings of negative expectations were $M = 1.095$ for the low depression group, and $M = 1.376$ for the high depression group. Given that the scale ranged from 1 to 7, ratings showed floor effects in both groups. Although we termed the scale "negative expectations", our participants rather reported very positive expectations. A concerning by-product of consistently positive ratings was that there was very little variation in ratings of negative expectations and negative experiences. Given that standard errors are

computed using the sample standard deviations, this might have led to inflated test-statistics, underestimated p -values, and overestimated effect sizes. In sum, despite being in line with model predictions, the generalization of our results to populations with more severe depressive symptoms is problematic not only due to the characteristics of our sample (very young, healthy, educated, and predominantly female) but also due to limited variation in the data. Lastly, it is important to note that our analyses were not pre-registered and, although theory-driven, to some extent exploratory. Our results require independent replication in a more heterogeneous sample with higher levels of depressive symptoms, preferably people with MDD diagnoses. Comparing people with and without MDD diagnoses allows for much more sound conclusions in comparison to the median split, which we conducted, that comes with several shortcomings (McClelland et al., 2015).

Despite the aforementioned limitations, the newly developed “prospective ESM” methodology of has proven feasible and well-suited to answer the questions at hand. Unlike retrospective assessment methods, our ESM-based measurements were not liable to memory biases (Ben-Zeev and Young, 2010), and we were able to achieve high overall adherence rates with only two participants showing insufficient compliance and more than 80% valid responses in the final sample, which is above the average response rates for ESM studies on mobile devices of approximately 70% (Berkel et al., 2017).

If corroborated in a clinical population, our findings have the potential to add to advances in the development of cognitive-behavioral interventions, for example by maximizing the violation of dysfunctional expectations (Rief and Joormann, 2019) or by increasing the salience of an expectation-disconfirming experience (Craske et al., 2014). Such interventions might be most effective *in vivo* using so-called ecological momentary interventions (Colombo et al., 2019) given that findings on exposure therapy for anxiety disorders show a renewal of conditional fear if surrounding contexts are changed (Bouton, 1993). Another potential treatment approach would be to target the rigidity of negative

interpersonal expectations by providing information that reduces the impact of cognitive immunization (Kube et al., 2019a), although it must be noted that the effect of cognitive immunization is subject to debate, as a recent study failed to demonstrate an effect of cognitive immunization on expectation updating in a non-clinical sample (Kube and Glombiewski, 2022). Interestingly, negative mood could be a potential moderator of the effect (Kube and Glombiewski, 2020).

In sum, the present study was a promising first step towards understanding the moment-to-moment effects of negative interpersonal expectations in MDD. The prospective ESM approach appears feasible and well-suited to examine interpersonal processes and associated expectations in vivo. The preliminary findings are in line with sound theoretical underpinnings, and they offer pathways to add to existing interventions.

Acknowledgements

We thank Kristina Sophie Hedelt and Fabian Steiner for their valuable contribution to data collection and –curation.

Declarations

Author contributions

Stefan Westermann was responsible for funding acquisition, investigation, project administration, resources, the planning of the study, the conceptualization, the methodology, and writing – review and editing. Thies Lüdtkke performed the data curation, formal analysis, writing of the draft and visualization of results. All authors read and approved the final manuscript.

Data availability

The data that support the findings of this study are available from the corresponding author, TL, upon reasonable request.

Compliance with Ethical Standards

Disclosure of potential conflicts of interest

The authors declare that there is no conflict of interest.

Funding

While conducting the study, Stefan Westermann received funding from the UniBE initiator grant. During analysis and write-up, Stefan Westermann and Thies Lüdtkke were funded by their institution. The study did not receive further funding. The funding had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

Ethics approval

This study was performed in line with the principles of the Declaration of Helsinki. The ethics committee of the Faculty of Human Sciences at the University of Bern approved the study (#2016-05-00006).

Informed consent

All participants provided written informed consent prior to participation.

References

- Abramson, L. Y., Metalsky, G. I., & Alloy, L. B. (1989). Hopelessness depression: A theory-based subtype of depression. *Psychological Review*, 96(2), 358-372. <https://doi.org/10.1037/0033-295x.96.2.358>
- Alloy, L. B., Olino, T., Freed, R. D., & Nusslock, R. (2016). Role of Reward Sensitivity and Processing in Major Depressive and Bipolar Spectrum Disorders. *Behav Ther*, 47(5), 600-621. <https://doi.org/10.1016/j.beth.2016.02.014>
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders: DSM-5™*, 5th ed. American Psychiatric Publishing, Inc., Arlington, VA, US. <https://doi.org/10.1176/appi.books.9780890425596>
- Antony, M. M., Bieling, P. J., Cox, B. J., Enns, M. W., & Swinson, R. P. (1998). Psychometric properties of the 42-item and 21-item versions of the Depression Anxiety Stress Scales in clinical groups and a community sample. *Psychological Assessment*, 10(2), 176-181. <https://doi.org/10.1037/1040-3590.10.2.176>
- Atherton, B. D., Nevels, R. M., & Moore, M. T. (2015). Predicting symptoms of depression from social anhedonia and emotion regulation. *J Nerv Ment Dis*, 203(3), 170-174. <https://doi.org/10.1097/NMD.0000000000000262>
- Beck, A. T., Weissman, A., Lester, D., & Trexler, L. (1974). The measurement of pessimism: the hopelessness scale. *J Consult Clin Psychol*, 42(6), 861-865. <https://doi.org/10.1037/h0037562>
- Beck, J. S. (2011). *Cognitive behavior therapy: Basics and beyond*, 2nd ed. Guilford Press, New York, NY, US.

- 519 Ben-Zeev, D., & Young, M. A. (2010). Accuracy of hospitalized depressed patients' and healthy
 520 controls' retrospective symptom reports: an experience sampling study. *J Nerv Ment Dis*,
 521 198(4), 280-285. <https://doi.org/10.1097/NMD.0b013e3181d6141f>
- 522 Berkel, N. v., Ferreira, D., & Kostakos, V. (2017). The Experience Sampling Method on Mobile
 523 Devices. *ACM Comput. Surv.*, 50(6), Article 93. <https://doi.org/10.1145/3123988>
- 524 Bolger, N., & Laurenceau, J.-P. (2013). *Intensive longitudinal methods: An introduction to diary and*
 525 *experience sampling research*. Guilford Press, New York, NY, US.
- 526 Bonito, J. A., Ruppel, E. K., & Keyton, J. (2012). Reliability Estimates for Multilevel Designs in
 527 Group Research. *Small Group Research*, 43(4), 443-467.
 528 <https://doi.org/10.1177/1046496412437614>
- 529 Bouton, M. E. (1993). Context, time, and memory retrieval in the interference paradigms of Pavlovian
 530 learning. *Psychological Bulletin*, 114(1), 80-99. <https://doi.org/10.1037/0033-2909.114.1.80>
- 531 Colombo, D., Fernandez-Alvarez, J., Patane, A., Semonella, M., Kwiatkowska, M., Garcia-Palacios,
 532 A., Cipresso, P., Riva, G., & Botella, C. (2019). Current State and Future Directions of
 533 Technology-Based Ecological Momentary Assessment and Intervention for Major Depressive
 534 Disorder: A Systematic Review. *J Clin Med*, 8(4), 465. <https://doi.org/10.3390/jcm8040465>
- 535 Craske, M. G., Treanor, M., Conway, C. C., Zbozinek, T., & Vervliet, B. (2014). Maximizing
 536 exposure therapy: an inhibitory learning approach. *Behav Res Ther*, 58, 10-23.
 537 <https://doi.org/10.1016/j.brat.2014.04.006>
- 538 D'Astolfo, L., Kirchner, L., & Rief, W. (2020). No1LikesU! – A pilot study on an ecologically valid
 539 and highly standardised experimental paradigm to investigate social rejection expectations

and their modification. *Clinical Psychology in Europe*, 2(2), 1-21.

<https://doi.org/10.32872/cpe.v2i2.2997>

Gamble, B., Moreau, D., Tippet, L. J., & Addis, D. R. (2019). Specificity of Future Thinking in Depression: A Meta-Analysis. *Perspect Psychol Sci*, 14(5), 816-834.

<https://doi.org/10.1177/1745691619851784>

Gao, S., Assink, M., Cipriani, A., & Lin, K. (2017). Associations between rejection sensitivity and mental health outcomes: A meta-analytic review. *Clin Psychol Rev*, 57, 59-74.

<https://doi.org/10.1016/j.cpr.2017.08.007>

Grosse Holtforth, M., Pincus, A. L., Grawe, K., Mauler, B., & Castonguay, L. G. (2007). When What You Want is Not What You Get: Motivational Correlates of Interpersonal Problems in Clinical and Nonclinical Samples. *Journal of Social and Clinical Psychology*, 26(10), 1095-1119. <https://doi.org/10.1521/jscp.2007.26.10.1095>

Hallford, D. J., & Sharma, M. K. (2019). Anticipatory pleasure for future experiences in schizophrenia spectrum disorders and major depression: A systematic review and meta-analysis. *Br J Clin Psychol*, 58(4), 357-383. <https://doi.org/10.1111/bjc.12218>

Hames, J. L., Hagan, C. R., & Joiner, T. E. (2013). Interpersonal processes in depression. *Annu Rev Clin Psychol*, 9(1), 355-377. <https://doi.org/10.1146/annurev-clinpsy-050212-185553>

Henrich, J., Heine, S. J., & Norenzayan, A. (2010). The weirdest people in the world? *Behav Brain Sci*, 33(2-3), 61-83; discussion 83-135. <https://doi.org/10.1017/S0140525X0999152X>

Herzog, P., Barth, C., Rief, W., Brakemeier, E.-L., & Kube, T. (2022). How Expectations Shape the Formation of Intrusive Memories: An Experimental Study Using the Trauma Film Paradigm. *Cognitive Therapy and Research*. <https://doi.org/10.1007/s10608-022-10290-4>

- Horwitz, A. G., Berona, J., Czyz, E. K., Yeguez, C. E., & King, C. A. (2017). Positive and Negative Expectations of Hopelessness as Longitudinal Predictors of Depression, Suicidal Ideation, and Suicidal Behavior in High-Risk Adolescents. *Suicide Life Threat Behav*, 47(2), 168-176. <https://doi.org/10.1111/sltb.12273>
- Kube, T., D'Astolfo, L., Glombiewski, J. A., Doering, B. K., & Rief, W. (2017). Focusing on situation-specific expectations in major depression as basis for behavioural experiments - Development of the Depressive Expectations Scale. *Psychol Psychother*, 90(3), 336-352. <https://doi.org/10.1111/papt.12114>
- Kube, T., & Glombiewski, J. A. (2020). How Depressive Symptoms Hinder Positive Information Processing: An Experimental Study on the Interplay of Cognitive Immunisation and Negative Mood in the Context of Expectation Adjustment. *Cognitive Therapy and Research*, 45(3), 517-528. <https://doi.org/10.1007/s10608-020-10191-4>
- Kube, T., & Glombiewski, J. A. (2022). No Evidence for the Involvement of Cognitive Immunisation in Updating Beliefs About the Self in Three Non-Clinical Samples. *Cognit Ther Res*, 46(1), 43-61. <https://doi.org/10.1007/s10608-021-10256-y>
- Kube, T., Glombiewski, J. A., Gall, J., Touissant, L., Gärtner, T., & Rief, W. (2019a). How to modify persisting negative expectations in major depression? An experimental study comparing three strategies to inhibit cognitive immunization against novel positive experiences. *Journal of Affective Disorders*, 250, 231-240. <https://doi.org/10.1016/j.jad.2019.03.027>
- Kube, T., Glombiewski, J. A., & Rief, W. (2018a). Situational expectations mediate the effect of global beliefs on depressive symptoms: a 1-year prospective study using a student sample. *Curr Opin Psychiatry*, 31(5), 409-416. <https://doi.org/10.1097/YCO.0000000000000443>

- 584 Kube, T., Rief, W., Gollwitzer, M., Gartner, T., & Glombiewski, J. A. (2019b). Why dysfunctional
 585 expectations in depression persist - Results from two experimental studies investigating
 586 cognitive immunization. *Psychol Med*, 49(9), 1532-1544.
 587 <https://doi.org/10.1017/S0033291718002106>
- 588 Kube, T., Rief, W., Gollwitzer, M., & Glombiewski, J. A. (2018b). Introducing an EXperimental
 589 Paradigm to investigate Expectation Change (EXPEC). *J Behav Ther Exp Psychiatry*, 59, 92-
 590 99. <https://doi.org/10.1016/j.jbtep.2017.12.002>
- 591 Kube, T., Rozenkrantz, L., Rief, W., & Barsky, A. (2020a). Understanding persistent physical
 592 symptoms: Conceptual integration of psychological expectation models and predictive
 593 processing accounts. *Clin Psychol Rev*, 76, 101829.
 594 <https://doi.org/10.1016/j.cpr.2020.101829>
- 595 Kube, T., Schwarting, R., Rozenkrantz, L., Glombiewski, J. A., & Rief, W. (2020b). Distorted
 596 Cognitive Processes in Major Depression: A Predictive Processing Perspective. *Biol*
 597 *Psychiatry*, 87(5), 388-398. <https://doi.org/10.1016/j.biopsych.2019.07.017>
- 598 Kube, T., Siebers, V. H. A., Herzog, P., Glombiewski, J. A., Doering, B. K., & Rief, W. (2018c).
 599 Integrating situation-specific dysfunctional expectations and dispositional optimism into the
 600 cognitive model of depression - A path-analytic approach. *J Affect Disord*, 229, 199-205.
 601 <https://doi.org/10.1016/j.jad.2017.12.082>
- 602 Li, X., Zhang, Y. T., Huang, Z. J., Chen, X. L., Yuan, F. H., & Sun, X. J. (2019). Diminished
 603 Anticipatory and Consummatory Pleasure in Dysphoria: Evidence From an Experience
 604 Sampling Study. *Front Psychol*, 10, 2124. <https://doi.org/10.3389/fpsyg.2019.02124>

- 605 Liu, H., Xie, Q. W., & Lou, V. W. Q. (2018). Everyday social interactions and intra-individual
 606 variability in affect: A systematic review and meta-analysis of ecological momentary
 607 assessment studies. *Motivation and Emotion*, 43(2), 339-353. [https://doi.org/10.1007/s11031-](https://doi.org/10.1007/s11031-018-9735-x)
 608 [018-9735-x](https://doi.org/10.1007/s11031-018-9735-x)
- 609 Liu, R. T., Kleiman, E. M., Nestor, B. A., & Cheek, S. M. (2015). The Hopelessness Theory of
 610 Depression: A Quarter Century in Review. *Clin Psychol (New York)*, 22(4), 345-365.
 611 <https://doi.org/10.1111/cpsp.12125>
- 612 Mathersul, D. C., & Ruscio, A. M. (2019). Forecasting the Future, Remembering the Past:
 613 Misrepresentations of Daily Emotional Experience in Generalized Anxiety Disorder and
 614 Major Depressive Disorder. *Cognitive Therapy and Research*, 44(1), 73-88.
 615 <https://doi.org/10.1007/s10608-019-10048-5>
- 616 McClelland, G. H., Lynch, J. G., Irwin, J. R., Spiller, S. A., & Fitzsimons, G. J. (2015). Median splits,
 617 Type II errors, and false-positive consumer psychology: Don't fight the power. *Journal of*
 618 *Consumer Psychology*, 25(4), 679-689. <https://doi.org/10.1016/j.jcps.2015.05.006>
- 619 Meehan, K. B., Cain, N. M., Roche, M. J., Clarkin, J. F., & De Panfilis, C. (2018). Rejection
 620 sensitivity and interpersonal behavior in daily life. *Personality and Individual Differences*,
 621 126, 109-115. <https://doi.org/10.1016/j.paid.2018.01.029>
- 622 Myin-Germeys, I., Kasanova, Z., Vaessen, T., Vachon, H., Kirtley, O., Viechtbauer, W., &
 623 Reininghaus, U. (2018). Experience sampling methodology in mental health research: new
 624 insights and technical developments. *World Psychiatry*, 17(2), 123-132.
 625 <https://doi.org/10.1002/wps.20513>

- 626 Myin-Germeys, I., Oorschot, M., Collip, D., Lataster, J., Delespaul, P., & van Os, J. (2009).
 627 Experience sampling research in psychopathology: opening the black box of daily life.
 628 Psychol Med, 39(9), 1533-1547. <https://doi.org/10.1017/S0033291708004947>
- 629 Nezlek, J. B. (2017). A practical guide to understanding reliability in studies of within-person
 630 variability. Journal of Research in Personality, 69, 149-155.
 631 <https://doi.org/10.1016/j.jrp.2016.06.020>
- 632 Nilges, P., & Essau, C. (2015). Die Depressions-Angst-Stress-Skalen. Der Schmerz, 29(6), 649-657.
 633 <https://doi.org/10.1007/s00482-015-0019-z>
- 634 Rief, W., Glombiewski, J. A., Gollwitzer, M., Schubö, A., Schwarting, R., & Thorwart, A. (2015).
 635 Expectancies as core features of mental disorders. Curr Opin Psychiatry, 28(5), 378-385.
 636 <https://doi.org/10.1097/YCO.0000000000000184>
- 637 Rief, W., & Joormann, J. (2019). Revisiting the Cognitive Model of Depression: The Role of
 638 Expectations. Clinical Psychology in Europe, 1(1), 1-19.
 639 <https://doi.org/10.32872/cpe.v1i1.32605>
- 640 Schallberger, U. (2005). Kurzskalen zur Erfassung der Positiven Aktivierung, Negativen Aktivierung
 641 und Valenz in Experience Sampling Studien (PANAVA-KS). Forschungsberichte aus dem
 642 Projekt: "Qualität des Erlebens in Arbeit und Freizeit, 6.
 643 [https://www.psychologie.uzh.ch/institut/angehoerige/emeriti/schallberger/schallberger-](https://www.psychologie.uzh.ch/institut/angehoerige/emeriti/schallberger/schallberger-pub/PANAVA_05.pdf)
 644 [pub/PANAVA_05.pdf](https://www.psychologie.uzh.ch/institut/angehoerige/emeriti/schallberger/schallberger-pub/PANAVA_05.pdf)
- 645 Starr, L. R., & Davila, J. (2008). Excessive reassurance seeking, depression, and interpersonal
 646 rejection: a meta-analytic review. J Abnorm Psychol, 117(4), 762-775.
 647 <https://doi.org/10.1037/a0013866>

- 648 Thimm, J. C., Holte, A., Brennen, T., & Wang, C. E. (2013). Hope and expectancies for future events
649 in depression. *Front Psychol*, 4, 470. <https://doi.org/10.3389/fpsyg.2013.00470>
- 650 Thompson, R. J., Spectre, A., S. Insel, P., Mennin, D., Gotlib, I. H., & Gruber, J. (2017). Positive and
651 Negative Affective Forecasting in Remitted Individuals with Bipolar I Disorder, and Major
652 Depressive Disorder, and Healthy Controls. *Cognitive Therapy and Research*, 41(5), 673-685.
653 <https://doi.org/10.1007/s10608-017-9840-2>
- 654 Twisk, J. W. R. (2019). *Applied Mixed Model Analysis* (2 ed.). Cambridge University Press,
655 Cambridge. <https://doi.org/10.1017/9781108635660>
- 656 Urban, E. J., Charles, S. T., Levine, L. J., & Almeida, D. M. (2018). Depression history and memory
657 bias for specific daily emotions. *PLOS ONE*, 13(9), e0203574.
658 <https://doi.org/10.1371/journal.pone.0203574>
- 659 van Winkel, M., Nicolson, N. A., Wichers, M., Viechtbauer, W., Myin-Germeys, I., & Peeters, F.
660 (2015). Daily life stress reactivity in remitted versus non-remitted depressed individuals. *Eur*
661 *Psychiatry*, 30(4), 441-447. <https://doi.org/10.1016/j.eurpsy.2015.02.011>
- 662 Wakeling, S., Stukas, A. A., Wright, B. J., & Evans, L. (2020). Negative Feedback Seeking and
663 Excessive Reassurance Seeking Behavior and Depression: A Meta-Analytic Review. *Journal*
664 *of Social and Clinical Psychology*, 39(9), 788-823. <https://doi.org/10.1521/jscp.2020.39.9.788>
- 665 Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of
666 positive and negative affect: the PANAS scales. *J Pers Soc Psychol*, 54(6), 1063-1070.
667 <https://doi.org/10.1037//0022-3514.54.6.1063>
- 668 Wilson, R. E., Harris, K., & Vazire, S. (2015). Personality and Friendship Satisfaction in Daily Life:
669 Do Everyday Social Interactions Account for Individual Differences in Friendship

- 670 Satisfaction? *European Journal of Personality*, 29(2), 173-186.
671 <https://doi.org/10.1002/per.1996>
- 672 Wu, H., Mata, J., Furman, D. J., Whitmer, A. J., Gotlib, I. H., & Thompson, R. J. (2017). Anticipatory
673 and consummatory pleasure and displeasure in major depressive disorder: An experience
674 sampling study. *J Abnorm Psychol*, 126(2), 149-159. <https://doi.org/10.1037/abn0000244>
- 675 Zetsche, U., Burkner, P. C., & Renneberg, B. (2019). Future expectations in clinical depression:
676 Biased or realistic? *J Abnorm Psychol*, 128(7), 678-688. <https://doi.org/10.1037/abn0000452>
677